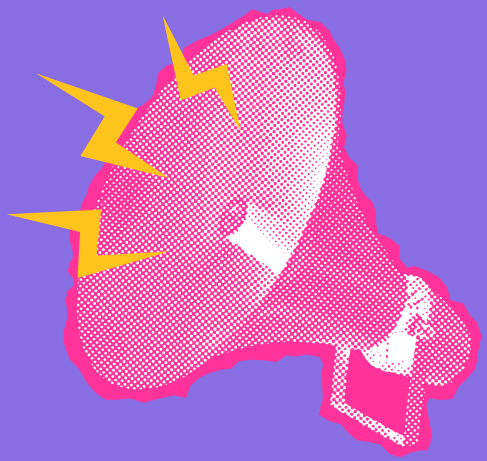
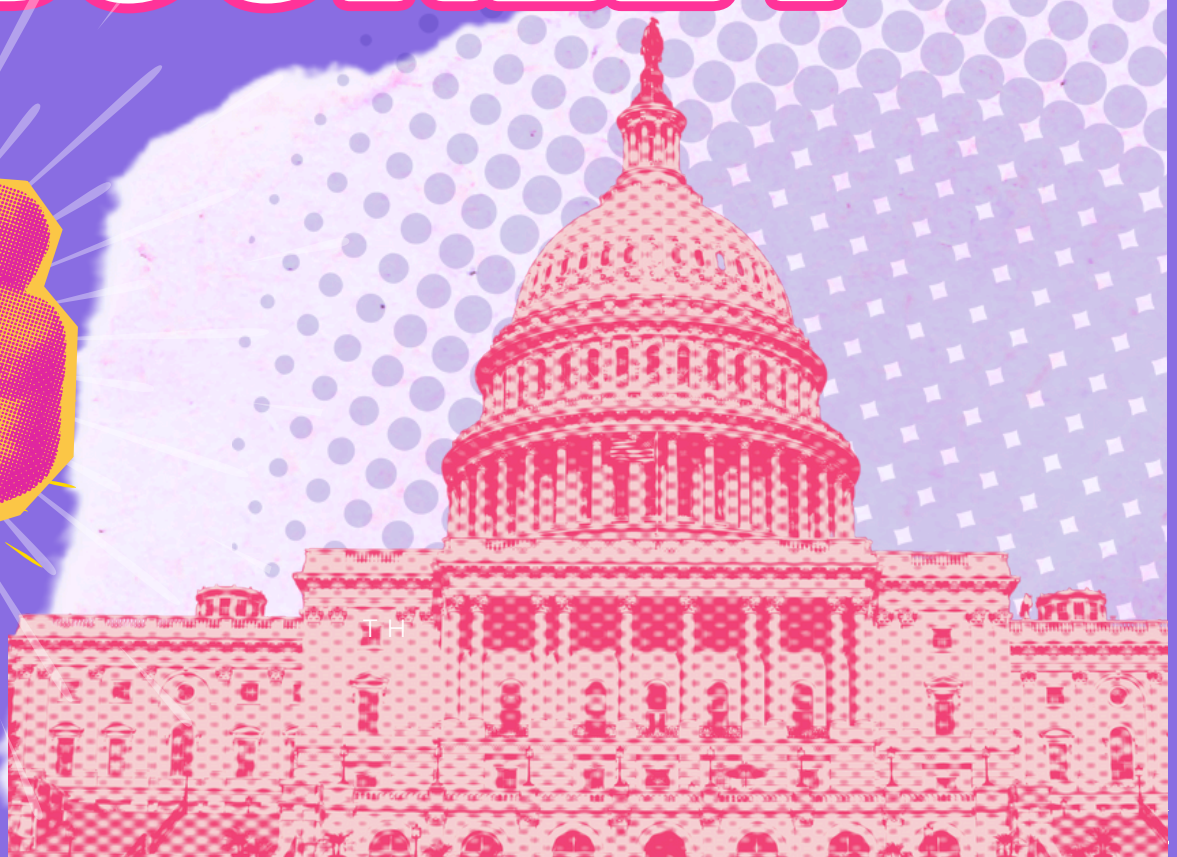
Future Physicians for Change

April 17 - 19, 2025
Washington, D.C

75TH | amsa ANNIVERSARY



POSTER SESSION ABSTRACT BOOKLET



OPENING ADDRESS

Welcome to the ***2025 AMSA's Future Physicians for Change Abstract Booklet***! Words cannot express how thrilled we are to celebrate and uplift your voices again in the pages that follow. Together, you each created such beautiful, powerful, and inspiring work, which will shape tomorrow's body of compassionate, human-centered medicine and research. In fact, you are already shaping today's. When we show up in this space, regardless of how it may wish to mold us, and we work diligently to stay true to the moral compass set within our hearts, something happens around us. All that medicine is and all that medicine *could be* can feel so separate at times. In a system where justice, care, equity, and belonging can feel out of reach, we shift the narrative and framework of what we believe it to be. As you advance through pre-medical studies and enter into the long road ahead to enter training, you may have looked forward to a certain milestone in your journey- the day you receive your white coat and read aloud your oath to "do no harm."

Here at AMSA, this oath comes alive again, for oftentimes, it can feel difficult to disentangle the practice of what we love and sought for from the reality of a politicized practice that often perpetuates the very injustice, inequity, and oppression that at its roots, it is intended to uplift. It is equally vital that we do not lose sight of this root- of the softness, compassion, and humanity that the medicine we fight for still can hold and reflect. *As one telling example, I hold a mirror to each of you.* We walk with you as you re-claim the power of this field and as you speak the truth that others so deeply need to hear, noticing that you are the very antidote the system has been aching for. We heal when we write, read, research, and are creative together. We heal others when we share the light inside of us with the world. When we ask difficult questions. When we lean in, even when we are fearful, and especially when it can feel easier to draw away. When we resist a practice of harm that marginalizes our communities. When we engage with curiosity and openness. When we publish, innovate, create, and design initiatives that go beyond symptomology and towards *understanding*. When we simply show up in our authenticity and hold tight to the fibers of our childhood or adult dreams of cultivating healing (*wherever they may have originated*) to practice the care we each believe in. That's the thing about roots- even when what springs forth from the soil feels disparate from what we imagined or what we recalled to have planted- *something is always blooming.* When we dig, remembering what we once believed the world could be, and we feel lost at what we are seeing- we search for that very root. The root of kindness- of humility- of the humanity embedded in each of us. The root of that very dream is planted in your heart, much like a seed, to be the one who seeks answers, who is unsatisfied with a body of medicine that does not do everything in its power to *see* and to *feel*- ultimately rewarding disembodiment and the a forced separation from the Self that longs to be present with us. This reminds me of the poem by Galway Kinnel, entitled "Saint Francis and the Sow." Here, Kinnel writes:

> …."The bud
> stands for all things,
> even those things that don't flower,
> ***for everything flowers***, from within, of self-blessing;
> ***though sometimes it is necessary***
> ***to re-teach a thing its loveliness,***
> to put a hand on its brow
> of the flower
> and ***re-tell it*** in words and in touch
> ***it is lovely***
> ***until it flowers again*** from within, of self-blessing…"

At times, it is necessary that we "re-teach a thing its loveliness,"- that we place a gentle hand and "re-tell it" that it is worthy- that it belongs. Whenever we each forget at some point or another, as we will, that medicine is lovely, that we are *each* lovely-we need not worry. We must only remind ourselves to re-teach, re-tell, and re-discover the root, which still and always will flower from within.

As you continue to validate these multitudes, know that AMSA is here to stand and fight alongside you. Many of you join AMSA because it is a place where advocacy and medicine align, where justice rings and *rolls down like water* from mountaintops to valleys. Where we work to *not* forget- to not perpetuate- to not dismiss what we see. Where we attempt to bring unconscious patterns to the conscious mind, in hopes of not forgetting or repeating past transgressions. Where we work *to* surround ourselves in community with others who challenge inequity and lean into an activism that works to uplift our intrinsic unity.

That is what you did when you submitted to our poster session. That is what you do as you sit in lecture halls and continue to learn and challenge yourself after long days and even longer nights. That is what you will continue to do and when you grow weary, which you often will, you (*again*) need not worry. You must only re-teach and re-tell yourselves that you are lovely, that you are fighting, and that your work matters, and that you are never in this alone.

So thank you, from the wellsprings of our hearts, for the commitment you gave to our 2025 Future Physicians for Change Poster Session. On April 19th, 2025, you were surrounded by 116 posters, spanning 10 categories, including Advocacy, Grassroots, and Policy, Basic and Translational Sciences, AMSA Academy Scholars Programs and Institutes Participant Projects, Chapter Activities, Community Development and Service projects, Curriculum Development and Educational Projects, Global Autoimmune Institute, International Impact, Patient-Oriented and Epidemiology Projects, and Reproductive Justice and Abortion-Related. We had 13 posters recognized at our awards ceremony, including People's Choice posters for both medical and pre-medical student projects. All awarded students will be listed at the onset of the abstract booklet.

Each of you brought something so unique and necessary into the space, so thank you so very much for giving us the opportunity to learn and grow alongside you. A second very special thank you must also be extended to our incredible judges, both virtual and in-person, who devoted countless hours to the facilitation of a scholarly and highly rewarding experience. Their feedback and mentorship guided us, making us stronger researchers and future clinicians who can hold the necessary space for both high academic rigor and equally high compassion. Intentional acknowledgements for our judges can be found in the coming pages of the booklet as well.

As you move through the pages of this publication, I hope you feel as proud of yourselves as we each are of you. It has been both a gift and a privilege to uplift your work this year and we are looking so forward to having the chance to do this again, so very soon, at our 2026 convention next December! I hope to see you there, ready to question, challenge, and rejoice in the belonging we have created here together.

Until then, friends, continue to shine your light. It touches more than you think.

United with you,

Donya Ahmadian (*she/her*)

Civic Science Fellow
Poster Session Chair

Note: Abstract titles, spelling, and order of names/institutes directly reflect submissions received. Poster snapshots are provided if included during submission, and omitted if not. Clarity of the snapshot is reflective of submission quality and some may be more difficult to discern. Poster board numbers in the “Abstracts & Poster Numbers” section are not necessarily ordinal due to pre-assignment and day-of attendance/registration changes. These numbers match the poster board number given on the day of the event. Additionally, all submissions are assumed to be medical students unless specifically noted as pre-medical. Award winners and associated abstracts will be listed immediately after the introductory index and all additional submissions thereafter. We are so grateful for each and every one.

For proper citing of your submission, the following format can be adopted for utilization in CV’s and for all academic referencing purposes:

Author(s). (2025). Abstract title. *Future Physicians for Change: Abstract Booklet*. The American Medical Student Association (AMSA).

For any questions, concerns, or anything in between, feel at ease to contact donya.ahmadian@amsa.org.

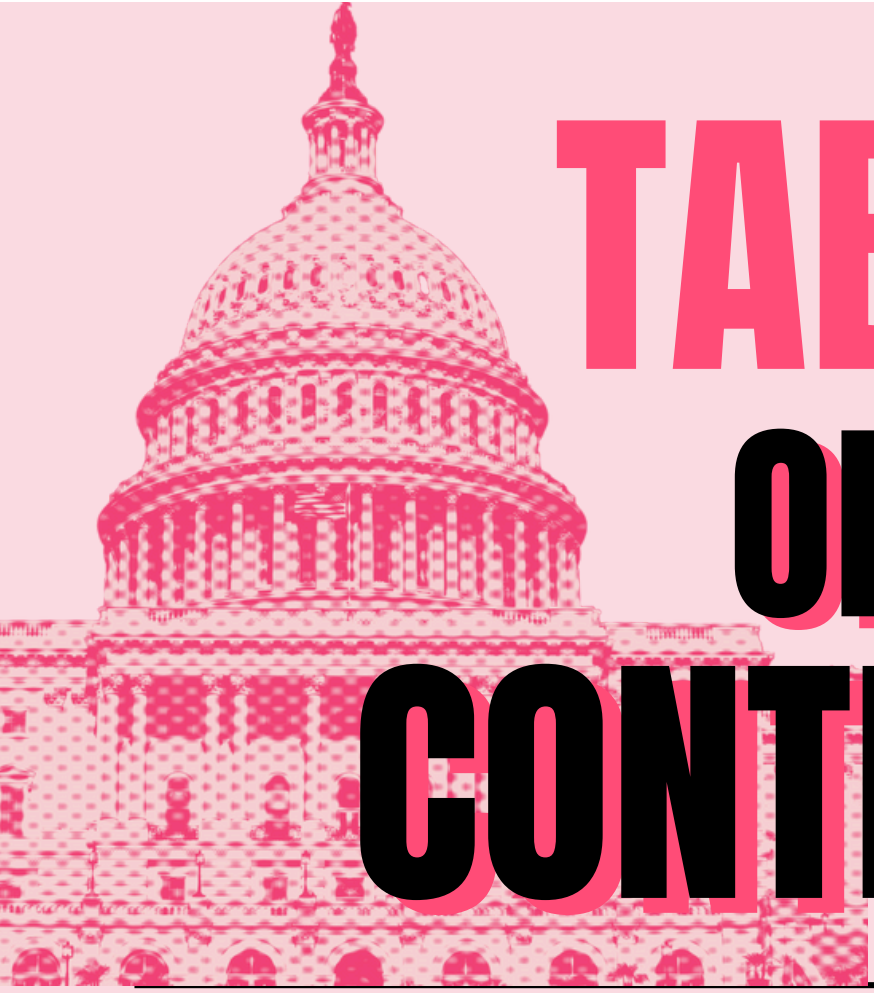


TABLE OF CONTENTS

ABSTRACT/POSTER NUMBERS 5

AWARD WINNERS 14

ABSTRACTS 38

INDEX 175

SPECIAL THANKS TO OUR POSTER SESSION JUDGES

Mary Beth Levin, MPH
Jeff Downing, BA
Alison Case, MD
Christina Kelly, MD
Marc Manseau, MD/MPH
Kate Sayeed, MD/MBA
Gloria Tavera, MD/PhD
Kristin Huntoon, DO/PhD
Mary Carol Jennings, MD/MPH
Richard Bruno, MD/MPH
Aliye Runyan, MD
Jeffrey Koetje, MD
Joy Udoh, MD
Remy Arnot, MD
Erik Sucher, MD
Austin Armstrong, MD
Lester Chong, MEng
Alvin Silva, MD
Johnathan Greene, EdD, MBA, RN, NRP, CHSE

Abstract & Poster Numbers

1 ***A Federal Health Insurance Agency's Roadmap for Health Equity: A Survey of Healthcare Leaders on Organizational Preparedness***
Keerit Mander[1]
[1]Glenwood High School, [2]SIU School of Medicine-McNeese Physician Preparatory Pathway Program, [3]Motherland Community Project

2 ***A Survey of the Role of Compensation in Medical Student Specialty Choice***
Allison Platt[1]*, Dr.Sabah Servaes*
[1]Amherst College

3 ***Empowering Future Physicians: Financial Planning Services for Minnesota's First-Generation Medical Students***
Isaiah Nolan[1]*,* ***Aarohi Shah***[1]*, Dr. Ana Núñez*
[1]University of Minnesota Medical School

4 ***Rates of Uninsurance as a Marker for Community Health in the State of Ohio***
Ashni Patel[1]*, Bayley McRitchie*
[1]Wright State University Boonshoft School of Medicine

5 ***Assessing the Impact of the Installation of Aunt Flow Free Menstrual Product Dispensers on Northeast Ohio Medical University's (NEOMED) Campus***
Elsa Khan[1]
[1]Northeast Ohio Medical University

7 ***Redefining Reproductive Healthcare Stigmas: Using Empathy as a Clinical Tool***
Alesandra Sheffler[1]
[1]Lake Erie College of Osteopathic Medicine, Seton Hill Campus

8 ***Unprepared and Unsupported: Moral Injury Among Medical Students in the Dominican Republic***
Yoalkris Salcedo[1]
[1]Universidad Iberoamericana

10 ***Breaking the Protocol: Revisiting the BIG 3 Upgrade for Patients on Anti-Platelet Agents with Minor Brain Injury***
Nicholas Sookhoo[1]*, Omran Majumder*[1]*, Jack Flanagan*[1]*, Adam Ostrovsky*[3]*, Amanda Reynolds*[2]*, Rachel Caiafa*[2]*, Nakesha King*[2]*, Jason Ho*[2]*, Jason Cheng*[2]*, Jeff Nicastro*[2]*, Ronald Simon*[2]
[1]State University of New York Downstate Medical Center COM, [2] Maimonides Medical Center, [3]Sidney Kimmel Medical College at Thomas Jefferson University

12 ***Comparing Neurobehavioral Profiles of Genetic Disorders with Shared Mechanisms***
Dr. Sydney Jacobs[1]*,* ***Seyda Kilic***[2]*, Dr. LeeAnne Snyder*[3]*, Dr. Katrina Boyer*[1]*, Dr. Siddharth Srivastava*[1]
[1]Boston Children's Hospital, [2]Tufts University, [3]Simons Foundation

13 ***Development of a Novel Phage Display Protocol to Identify a Peptide Diagnostic for Early-Stage Epithelial Ovarian Cancer***
Vera Rivard[1]*, Jennifer Dimitrov*[1]*, Princesa Gonzalez*[1]*, Hailey Lombardi*[1]*, Colin McGarry*[1]*, John Nangle*[1]*, Ulises Orellana*[1]*, Callum Park*[1]*, Riley Stogsdill*[1]*, Shannon Hogan*[1]
[1]Regis College, Watson-Hubbard Science Center, 235 Wellesley St.

14 ***Differential expression of senescence markers in human diabetic kidney disease: a digital spatial profiling study***

Farha Deceus[1], *Dr Khaled Elhusseiny*[2], *Dr Lynn Cornell*[3], *Dr Xiaohui Bian*[2], *Yaohua Ma*[4], *Jennifer Kachergus*[5], *Dr Aubrey Thompson*[5], *Dr LaTonya Hickson*[2]
[1]Mayo Clinic Alix School of Medicine, [2]Division of Nephrology and Hypertension, Department of Medicine, Mayo Clinic, [3]Department of Laboratory Medicine and Pathology, Mayo Clinic, [4]Division of Biomedical Statistics, Mayo Clinic, [5]Department of Cancer Biology, Mayo Clinic

15 ***Exploring Hypermobile Ehlers-Danlos Syndrome Related Phenotypes in a Novel Mouse Model with Col5a1 Missense Mutations***

Rory Sheng[1,2], *Daphine Anand*[2], *Shirley Zhang*[1,2], *Ali Nunes*[2], *Dr. Mainak Sarkar*[2], *Rohan Mandhan*[2], *Dr. Mariana Kersh*[1], *Carly Lockard*[3], *Dr. Bruce Damon*[1,3], *Dr. Amy Wagoner Johnson*[1,2], *Dr. Christina Laukaitis*[1,2]
[1]Carle Illinois College of Medicine at the University of Illinois Urbana-Champaign, [2]Carl R. Woese Institute for Genomic Biology at the University of Illinois Urbana-Champaign, [3]Stephens Family Clinical Research Institute at Carle Health

16 ***Food-based approach for oral cancer prevention and treatment: Lessons learned from in vivo and clinical studies***

Amanda Penn[1], *Neha Bhandari*[1], *Riley Petrovich*[1], *Dr. Anupam Bishayee*[1]
[1]Lake Erie College of Osteopathic Medicine Bradenton

18 ***Lymph node lymphangiogenesis constrains the germinal center structure to enhance selection and functional antibody production during cutaneous virus infection***

Mr Luan Firmino Cruz[1], *Ms Tenny Mudianto*[1], ***Lina Fikri***[2], *Ms Ritika Luthra*[1], *Mrs Amanda Lund*[1], *Ms Carla Nowosad*[1]
[1]NYU Grossman Sch. of Med., [2]Tufts University

19 ***Sporadic Hemiplegic Migraine and Random Forest – A Diagnosis After 13 Years Using Machine Learning***

Anusha Reddy[1]
[1]San Juan Bautista SOM

20 ***Synaptic Plasticity Alterations in the Infralimbic Cortex Following Cocaine Self-Administration***

Mansi Madaik[1], *Lily Vu*[1], *Christopher Driskill*[1], *Laney Waydick*[1], *Zarin Hasan*[1], *Mackenzi Dodd*[1], *Sven Kroener*[1]
[1]The University of Texas at Dallas

9 ***3D Modeling for the Production of a Biosafety Level 2 Facility***

Princesa Gonzalez[1]
[1]Regis College

21 ***Evaluation of the Heart Health Fair and Its Effectiveness in Public Health Initiatives/ screening by Medical Students***

Rhieya Rahul[1], **Mr Atharv Katam**[1], **Ms Khushboo Gupta**[1]
[1]Royal College of Surgeons in Ireland

25 ***Steps Towards Healing: Bringing Wound Care Treatment to the Skid Row Population***

Kathleen Kilroe*, Dr. Mary Marfisee*
[1]University of California, Los Angeles, David Geffen School of Medicine

113 ***Quantifying Patient Savings: The Economic Impact of Willow Clinic's Services***

Zane Haidar[1], **Claire Lin**[1], **Taylor Schwarz**[1], **Marco DelFava**[3], Dr. Kate Richards[2], Dr. Kirti Malhotra[2]
[1]University of California, Davis, [2]UC Davis Medical Center, [3]First Step Communities

22 ***A Decade-Long Impact of the Mid Central Area Health Education Center Health Careers Pipeline Program on Students Pursuing Healthcare Careers in Rural & Underserved Michigan***

Adam Gaetz[1,2,3], Husna Hussaini[1,2], Grace Lehto[1,2]
[1]Central Michigan University College of Medicine, [2]Mid Central Area Health Education Center, [3]American Medical Student Association

23 ***Improving Health Equity: Tailored Services for Addressing Disparities in Underserved Asian Communities***
Jaishree Ramamoorthi[1], **Ashanti Ambriz**[1], **KG Samford**[1], **Zibiah Ho**[1]
[1]University of California, Davis

26 ***The Lifetime Impact of Incarceration on Women's Health***
Ms. Morgan Motakef, **Likhita Nandigam**[1], **Ms. Divya Popat**, Mr. Adith Ram, Ms. Abigail Rex, Mr. Marc Robinson
[1]Baylor COM

116 ***Radiology-Enhanced Anatomy Education: A Novel PILOT Approach at Wright State Boonshoft School of Medicine***
James Dai[1], Betsy Gauthier[1], Garrett Fischer[1], Anuradha Haridhas[1], Dr. Annelise Silva[1], Dr. Barbara Kraszpulska[1], Dr. Annie Rhee[2], Dr. Amar Shah[2], Dr. Harrison Lang[2], Dr. Parker Brown[2], **Aubrienne Silva**[3], Dr. Alvin Silva[1]
[1]Wright State University Boonshoft School of Medicine, [2]Mayo Clinic Arizona, [3]University of California at Los Angeles

28 ***Artificial Intelligence in Medical Training: A Large Language Model-Based Standardized Patient Platform***
Willis Tang[1], Aniket Pratapneni[1], Matthew Kim[1], Nabaan Mir[1], Paul McMillan Villalobos[1], Gavin Shu[1]
[1]University of California, San Francisco, SOM

29 ***Climate Change as a Threat Multiplier: The Case for Student Initiative in Medical Education***
Annie Yu[1], **Robert Pritchard**
[1]Geisinger Commonwealth School of Medicine

30 ***Development of a Cocurricular Program to Educate Pre-Health Students About Social Determinants of Health***
Autumn Woolpert[1]
[1]Creighton University

31 ***Empowering medical students to address spiritual needs in patient care: a new curriculum***
Vibha Sastri[1]
[1]University of Virginia School of Medicine

32 ***Evaluating Planetary Health in Medical Education***
Weilin Qiu[1]
[1]University of Alberta Faculty of Medicine and Dentistry

33 ***Fostering Change in Medicine: Bridging Gaps Through Mentorship and Communication Competency Training***
Danielle Pierson[1], Dr. Kari Dugger
[1]Edward Via College of Osteopathic Medicine Auburn

34 ***Gender Disparities in Medical Student Clinical Experiences during Obstetrics and Gynecology Rotations in USA***
Naushad Khan[1], Luv Agarwal[2], Ritesh Sheth[3], Rehana Shaikh[1]
[1]Windsor University School of Medicine, [2]All Saints University School of Medicine, [3]Spartan Health Sciences University

35 ***Grass Roots Implementation of Lifestyle Medicine in the Pre-Clinical Medical Curriculum***
Anjali Venkat[1], **Ethan Belnap**[1], **Riana Schleicher**[1], Dr. Courtney Stefanski[1]
[1]Rush Medical College of Rush University Medical Center

36 ***Healthcare and Medical Simulation to Aid Mental Health and Abuse Encounters***
Bairavi Maheswaran[1]
[1]New York Institute of Technology College of Osteopathic Medicine

37 ***Impact of High-Fidelity Clinical Simulation on Clinical Performance Compared to Traditional Observational Learning***
Sandra Fanous[1], **Hannah Mixon**[1], **Dana Parker**[1], **Mikaylah Rutledge**[1]
[1]Alabama College of Osteopathic Medicine

38 ***Impacts of Medical Education in High School on Healthcare Career Determination***
Lucas Goetz, Jessica Linke, Madeline Melanson, Molly Lien, Bailey DeJong, Abbey Rieber, Dr. Jason Kemnitz
[1]The University of South Dakota Sanford School of Medicine

40 ***Misinformation in the Media: Educating Medical Students about Abusive Head Trauma***
Brooke Starn[1], Dr. Vincent Palusci[1]
[1]New York University Grossman SOM

42 ***Pilot Study: Elevating Medical Students' Skills and Self Efficacy in Surgical Clerkship through Near Peer Teaching***
Emily Major[1], Dr. Jennifer Brueckner-Collins, Mr. Ryan Cantrell, Ms. Michaela Dukes, Mr. Mohammad Abou El-Ezz, Mr. Cameron Stephens, Mr. John Davis, Mr. Grayson Stinger
[1]University of Louisville SOM

44 ***Rethinking Medical Education in Uncertain Times: Preparing Future Doctors with Less Debt, Stress and Time Without Compromising Patient Care***
Ankit Jain[1]
[1]Lake Erie College of Osteopathic Medicine, Seton Hill Campus

47 The Impact of Combined Mandatory and Optional Mindfulness-Based Interventions on Stress Levels in First-Year Medical Students
Sonali Notani[1], **Karina Butani**[1]
[1]Tulane University School of Medicine

49 ***The Role of Social Determinants on Diabetes Management: How Housing Stability and Food Security Shape Outcomes in Low-Income Communities***
Kaylynn Yune, **Toros Kehribarian**, **Anisha Shukla**, **Kian Chou**, **Manvel Bosnoyan**
[1]University of California, Berkeley

50 ***Training for impact: a universal approach to using medical interpreters in healthcare***
michael benavidez[1], Daniela Gonzalez[1], Haleigh Stein[1], Alyssa McMandon[1], Elisabeth Caldwell[1], Katerine Molina
[1]Edward Via College of Osteopathic Medicine Carolinas Campus

52 ***Visual arts and humanities in medical education***
Lauren Schild[1], Craig Uthe[1,2]
[1]The University of South Dakota Sanford SOM, [2]Sanford Health

54 ***Unseen and Undiagnosed: Addressing Diagnostic Delays and Health Disparities in Lupus Among African American Men***
Mrs. Sanika Joshi, Ms. Hope Fardanesh
[1]Midwestern University - Arizona College of Osteopathic Medicine

53 ***Skin of Color Specifications in Visible Light Phototherapy for Immune-Mediated Dermatological Conditions: Psoriasis, Vitiligo, and Atopic Dermatitis***
Sooin Choi, Taylor Murphy, Priya Patel, Matthew Hoffman, Guneet Shah, Tyler Wong, Kurt Ashack, M.D.
[1]Michigan State University College of Human Medicine

55 ***A systematic review of effective strategies for breast cancer screening in low-resource settings***
Dr. Ramin Asgary[2], **Hunter Anderson**[1,2]
[1]Wright State University Boonshoft School of Medicine, [2]George Washington University - Milken Institute School of Public Health

56 ***Episiotomy Practices in the Dominican Republic: A Call for Change***
Paria Remolina[1], Angel Mendoza Barrera, Zeta Acosta
[1]Universidad Nacional Pedro Henriquez Ureña

57 ***Passive Maternal Smoking and Offspring Health in The Gambia: A Cross-sectional Observational Pilot Study***
Dr. Yahya Korteh[1], **Etianna Etienne**[2]
[1]Montefiore Medical Center - Wakefield Hospital, [2]Lone Star College

58 ***PinkDetect: A Digital Health Solution to Battling Stigma Against Breast Health Awareness in a Lower Middle-Income Country***
Syed Waqas[1], Ms. Suha Lalani, Ms. Solmaz Iranpour
[1]Aga Khan University

115 ***Participant Demographics in U.S. Pediatric Leukemia and Lymphoma Trials Since the NIH Revitalization Act of 1993***
Andres Diaz[1], Sohail Daulat, Jasen Alabana, Shreyas Hallur, Shiv Shah, **Sara Diaz**
[1]University of Arizona College of Medicine

59 ***"Amphetamine shortages may disproportionately affect females: A case study of neural circuitry differences by medication type in 6–8-year-olds."***
Darius Shahbazi[1]
[1]Kansas City University College of Osteopathic Medicine

60 ***A Correlation Between a Dysregulated Circadian Rhythm & Early-Onset Alzheimer's Disease: a Transcriptomic Meta-Analysis***
Lilianna Henry[1,2]
[1]Marymount University, [2]The Collegeboard Advanced Placement Capstone Program

61 ***A Medical Student-Run Hospital Tobacco Treatment Program***
Saanya Lingineni[1], Sherry Wu[1], Kevin Shan[1], Matthew Wang[1], John Grable[1]
[1]University of Rochester Medical Center SOM and Dentistry

62 ***A Rapid Decline in A Patient with Creutzfeldt-Jakob Disease***
Mishal Siddiqui[1], **Muhammad Nawaz**, Tamara Williams, Haniya Siddiqui
[1]Campbell University School of Osteopathic Medicine

63 ***A Rare Case of Type II Adult Hypertrophic Pyloric Stenosis Secondary to Chronic Peptic Ulcer Disease: A Case Report***
Riah Lee[1], Sylvia Dygulski[1], Dr. Yasmine Hemida[2], Dr. Guillermo Uy
[1]Touro College of Osteopathic Medicine Middletown, [2]Garnet Health Medical

64 ***A retrospective study to assess demographic, socio-economic and health-care access disparities in skin cancer patients***
Nanditha Srinivasan[1], Dr. Shreya Deoghare, Dr. Marina Samuel Basta, Dr. Selamawit Mammo, Dr. Kambam Sneha Reddy
[1]Sri Ramachandra Institute of Higher Education and Research

66 ***Analyzing the Impact of Social Determinants and Discrimination on Disparities in Coronary Atherosclerotic Disease Rates Among Black and White American Males***
Ida Wilks[1]
[1]University of Houston

67 ***Associations Between Food Insecurity and Self-Perceived Physical and Mental Health Among Urban College Students***
Lily Amorosino[1], Mackenzie Konyar[1], Aditi Venkateswaran[1], Sean Watley[2], Grace Jordan[1], Kaleigh Steigman[2], Andrew Sonn[2], Jennifer Sacheck[3], Gabby Headrick[1]
[1]George Washington University Milken Institute School of Public Health, [2]George Washington University, [3]Brown University School of Public Health

68 ***Beyond Assessments: Sociocultural Impact on Attention Deficit Hyperactivity Disorder Presentation and Diagnosis***
Tetteh-Ocloo Freda[1], Moreen Famosa, Vincent Harvey
[1]American Canadian School of Medicine

69 ***Clinical Manifestations and Effects of Dengue Fever in Post-Operative Renal Transplant Recipient Patients***
Maria Perez, **Daniel Rodriguez**, **Manuel Medina**

70 ***Comparative Effectiveness of Three Potassium Exchangers in the Acute Management of Hyperkalemia***
Francisco Ibarra[1,2], **Victor Fu**[1], Colena Mau[1], Dominic Rivera[1], Alexander Arzoo[1]
[1]California Health Sciences University, [2]Community Regional Medical Center - Department of Pharmacy Services

71 ***Concealed Carry Legislation and Firearm-Related Deaths in the United States: Possible Causes and Ramifications***
Amelia Liu[1], Kyle Willette[1], Jeanette Manger[1]
[1]Wright State University Boonshoft School of Medicine

72 ***Demographic Differences in Cognitive Decline: An Analysis of U.S. BRFSS Data on Age, Gender, Ethnicity, and Region***
Nursen Arslanyilmaz[1]
[1]Youngstown State University

73 ***Development of an AI-assisted mobile application for improving polypharmacy management, medication adherence, and patient education in outpatient settings***
Pavitra Attanayake[1], **Jory Nagel**[2], **Nathaniel Hagan**, Mr. Nicholas Warriner, Joseph Mariscal[1], Dr. Mark Trottier[1]
[1]Michigan State University College of Human Medicine, [2]Western Michigan University Homer Stryker MD School of Medicine n

74 ***Digital Age Headaches: Exploring the Neurological Impact of Screen Time and Blue Light***
Israel Ihunda[1], Mr. Tamaratubor Ambah[1], Mr. Favour Enoch Abidoye[1], Mr. Cejay Alexi McCalla[1], Mr. Mololuwa Kalejaiye[1]
[1]All Saints University School of Medicine, Dominica

75 ***Discordance among apoB, HDL-C, and LDL-C as a Predictor of MACE***
Maeve Shannahan[1]
[1]Emory University

77 ***Emergency Room Visits of Incarcerated Individuals in Texas: A Retrospective Analysis of Trauma-Related Admissions and Health Implications***
Sonya Bhatia[1], Andrea Argenal[1], Sowmya Duddu[1], Julia Paz[1], Tori Sayers[1], Dr. Bharathi Gadad[1], Dr. Kelsey Baker[1]
[1]University of Texas Rio Grande Valley SOM

78 ***From Theory to Practice: How Medical Students Engage with Sunscreen Usage***
Kelsey Liu[1], Xiaoyao Qu[1], Dr. Leslie Goldstein[1]
[1]New York Institute of Technology College of Osteopathic Medicine

79 ***Liberal versus Restrictive blood transfusion in patients with traumatic brain injury: A meta-analysis of randomized controlled trials***
Ogechukwu Obi[1], Pawel Lajczak, Uchenna Nweze, Patricia Asonye
[1]New York Institute of Technology College of Osteopathic Medicine

80 ***Mitigating Suicide Risk: The Impact of Social Connectedness and Daily Functioning in Psychiatric Patients with Substance Use Disorders or a History of Trauma***
Sirapa Vichaikul[1], PhD Evonne Edwards[1,2], PhD Tracy Koehler[2]
[1]Michigan State University College of Human Medicine, [2]Pine Rest Residency and Fellowship

81 ***Orthopedic Burden of Pedestrian Road Injuries: Analyzing Sex Differences in Mortality, YLLs, and HDI Correlations in Georgia, Syria, and Tajikistan Over Three Decades***
Britney Shaw[1], Cameron J. Sabet[1], Phillip C. McKegg[2], Amber Park[3], Sai Kurapati[4], Muhammad Mustafa[5], Dang Nguyen[6], Le Huu Nhat Minh[7]
[1]Georgetown University Medical Center, [2]Department of Orthopaedic Surgery, OhioHealth Grant Medical Center, [3]Lincoln Memorial University-DeBusk College of Osteopathic Medicine, [4]Penn State College of Medicine, [5]Judy Genshaft Honors College, University of South Florida, [6]Massachusetts General Hospital, Corrigan Minehan Heart Center, Harvard Medical School, [7]International Ph.D. Program in Medicine, College of Medicine, Research Center for Artificial Intelligence in Medicine, Taipei Medical University

82 ***Primary parathyroidism from concurrent parathyroid hyperplasia and ectopic parathyroid adenoma***
Clarice Szeto[1], June Yao[2], Chantal Riba[2], Chau Nguyen[2]
[1]Western University of Health Sciences, College of Osteopathic Medicine of the Pacific, [2]Community Memorial Health Systems

83 ***Provider perspectives on addressing stigma and biases in chronic pain management for individuals with HIV and substance use disorder***
Isabella Iregui[1], Sonya Bhatia, Dr. Amy Knowlton, Dr. Tuo-Yen Tseng
[1]Johns Hopkins University

85 ***Social Determinants of Health and Biologics for Children with Severe Persistent Asthma: A Retrospective Review***
Gia-Binh Nguyen[1], Dr. Tanvi Patel[1,2], Dr. Adalberto Torres[1,2]
[1]University of Central Florida College of Medicine, [2]Nemours Children's Hospital

86 ***The Impact of Hidradenitis Suppurativa on Sexual Health in Women Compared to Men: A Systematic Review***
Elissa Cleland[1], Alim Osman[1], Alexandra Nigro[1], Michael Povelaitis[2], Dr. Marc Z. Handler[3,4]
[1]Eastern Virginia Medical School, [2]Hackensack Meridian School of Medicine, [3]New York Medical College, [4]Rutgers School of Medicine

87 ***The Impact of Obesity on Orthopedic Injuries and Fracture Patterns in Motor Vehicle Accidents***
Philip Zitser
[1]New York Institute of Technology, Manhattan, [2]New York Medical College, [3]Richmond University Medical Center, [4]University of Tampa

88 ***The Relationship Between Verbal and Non-Verbal Imitative Learning, Gesture Production, and Social Communication in Children with Autism Spectrum Disorders.***
Karen Linares[1]
[1]Johns Hopkins University

89 ***The Use of Brain PET Scans Pre- and Post- Anaerobic Exercise as a Diagnostic or Exploratory Tool for Glycogen Storage Disease Type 1: A Theoretical Study***
Ava Vanaman[1]
[1]Appalachian State University

90 ***The Vital Role of Sunscreen in Skin Health: Addressing Misconceptions and Enhancing Awareness Among Individuals with Melanin-Rich Skin***
Yusuf Nawaz[1], **Mrs. Mishal Siddiqui**[1]
[1]Campbell University School of Osteopathic Medicine

100 ***Let's Talk About Sex: Assessing the Impact of an 8-week Comprehensive Sexual Health Curriculum on Teenage Youth in Washington D.C. in Teen Promise Project***
Sarah Watkins[1], Erin McLaughlin[1], Anna BuAbbud[2]
[1]George Washington University School of Medicine and Health Sciences, [2]The American College of Obstetrics and Gynecology

101 ***Narrative Justice in Action: Reducing Abortion Stigma in Medical Education Through Patient Storytelling in Case-Based Learning***
Ms Sophie Schott[1], **Ms Chelsea Romero**[1], **Ms Julia O'Gara**[1], Ms Madison Schulz[1], Ms Likhita Nandigam[2], Ms Grace Drew[1], Ms Isha Parikh[1], Dr. Elizabeth Nugent[1]
[1]McGovern Medical School at the University of Texas Health Science Center Houston, [2]Baylor College of Medicine

102 ***Pain in IUD Placement: Pre-, Intra-, and Post-Procedure Interventions to Improve the Patient Experience***
Coleman Schaefer[1], **Isabela Bello-Zap**, Benjamin Ihms[1]
[1]A.T. Still University School of Osteopathic Medicine in Arizona

103 ***Policy Analysis: Implications of the Abortion Ban in Georgia in Relation to Maternal Deaths***
Pranitha Kaza[1], **Divya Tadanki**[1], Maitri Pathak[1], Haya Fatmi[1]
[1]Georgia Institute of Technology

104 ***Promoting Reproductive Justice: Addressing Health Disparities and Maternal Mortality in Marginalized Communities***
Leymis Alfonso-Marquez[1], **Rhieya Rahul**[2], **Henry Le**[3], **Yasaman Dasteh Goli**[4]
[1]Hillsborough Community College, [2]Royal College of Surgeons in Ireland, [3]University of California San Diego, [4]Edward Via College of Osteopathic Medicine

105 ***Reproductive Health and Family Planning: A Student-Led Curriculum Initiative in a State with Abortion Restrictions***
Uma Reddy, Kadambari Suri, **Madison Sobarzo**, Deepak Muthyala, Isabella Berrueta, Dr. Rajesh C Miranda
[1]Texas A&M Health Science Center COM

106 ***Reproductive Rights and Children's Health Outcomes: Exploring the Link Between Policy and Mortality Rates***
Rachel Bobko[1], Kira Markowski[1], Dr. Jeannette Manger[1], Dr. Adrienne Stolfi[1]
[1]Wright State University Boonshoft School of Medicine

107 ***Similar Vascular Function and Oxidative Stress Following a High-Fat Meal in Both Men and Women***
Ms. Naomi Gedion[1], Cynthia Weiner[1], Emily Blake[1], Sara Mascone[1], Shannon Khan[1], Maria da Silva[1], Steven Prior[1], Sarah Kuzmiak-Glancy, Sushant Ranadive[1]
[1]University of Maryland

108 ***Socioecology of Pregnancy Planning among Nulliparous Americans***
Gayatri Aluri[1], Monica Keith[1]
[1]Vanderbilt University

109 ***The Cost of Gaps in Care: A Rare Convergence of Local Anesthetic Systemic Toxicity (LAST) and Preeclampsia***
Jenny Lu, Ms. Alice Huang[1,2], Ms. Nicole Pancotto[1,2], Ms. Kathryn Tovar[2], Dr. Roxana Lazarescu[2]
[1]Touro College of Osteopathic Medicine Harlem, [2]Wyckoff Heights Medical Center

110 ***The Impact of Abortion Restrictions on Medical Students in Georgia***
Danielle Obiri[1], Rayyan Khan[1], Brenna Martin[1], Sakshi Sehgal[1], Olivia Piscano[1]
[1]Medical College of Georgia at Augusta University

111 ***The Impact of the Political Climate on Reproductive Health Perceptions in Texas: A Survey-Based Analysis***
Lizette Villanueva[1], **Paria Mosaffa**[1]
[1]University of Houston

112 ***Transforming Reproductive Healthcare: The Role of Telemedicine in Expanding Access and Equity***
Drumi Shah[1], **Prashant Yadav**[2]
[1]The University of Alabama in Huntsville, [2]Spartan Health Sciences University

91 ***Access, Choice, and Change: Analyzing Trends in Contraceptive Use and Provider Participation in California's Family PACT Program***
Yasamin Pashmineh Azar[1], Amir Reza Pashmineh Azar, Drumi Shah
[1]A.T. Still University School of Osteopathic Medicine in Arizona

92 ***Barriers to and Facilitators of South Asian College Students' Access to Sexual and Reproductive Health Services***
Ms. Zarya Shaikh
[1]Stony Brook University

93 ***Beyond the Classroom: The Impact of Abortion Experience on Reproductive Health Competencies***
Julia O'Gara[1], **Chelsea Romero**[1], Sophie Schott[1], Madison Schulz[1], Grace Drew[1], Isha Parikh[1], Dr. Elizabeth Nugent[1]
[1]McGovern Medical School at the University of Texas Health Science Center Houston

94 ***Champions of Change***
Gabrielle Bowen[1], Zoe Goldberger, Lily Sloan, Haley Pollock, Kristen Liberty, Francesca Galasso, Dr Madi Lindauer, Dr Juhi Varshney, Dr Esther Choo, Dr Dara Kass, Dr Marta Rowh
[1]St. George's University School of Medicine

95 ***Empowering Youth: A Medical Student's Role in Menstrual and Reproductive Health Education***
Alexis Zazvrskey[1]
[1]Sidney Kimmel Medical College at Thomas Jefferson University

96 ***Every Pregnancy Deserves Precision Care: Cover CGMs for Pregnant Women with Gestational Diabetes***
Cerena Clark[1]
[1]University of Central Arkansas

97 ***From Resistance to Liberation – The Fight for Reproductive Justice***
luv agarwal[1], **Naushad Khan**[2], **Dr Ritesh Sheth**[3]
[1]All Saints University School of Medicine, [2]Windsor University School of Medicine, St. Kitts and Nevis, [3]Spartan Health Sciences University

98 ***Impact of Abortion Restrictions on Childhood Health Outcomes***
Rico Carter[1], Griffin Suppa[1]
[1]Wright State University Boonshoft School of Medicine

AWARD WINNERS

Double Award Winner: ***People's Choice-Best Overall Poster in All Categories by a Medical Student and International Impact Projects***

58

PinkDetect: A Digital Health Solution to Battling Stigma Against Breast Health Awareness in a Lower Middle-Income Country

Syed Waqas[1], Ms. Suha Lalani, Ms. Solmaz Iranpour
[1]Aga Khan University

Biography: *A final-year medical student at Aga Khan University, who is passionate about bridging the communication gap in healthcare, particularly for marginalized communities. As chief medical consultant at PinkDetect, he ensures the app is jargon-free and accessible to all users.*

Abstract

Background: In Pakistan, breast cancer poses a severe public health challenge, with one of the highest mortality rates globally. The factors contributing to these alarming statistics include inadequate awareness, prevailing social stigmas regarding women's health, and limited access to healthcare services. Addressing these issues, our solution, PinkDetect, employs a technology-driven approach to democratize breast health awareness.

Methods: We have developed the first mobile application in Pakistan focused on breast health, designed to disseminate breast cancer education. After conducting focused group discussions, we identified social taboos as a major barrier to addressing this issue. To overcome this, we utilized socially acceptable images and vocabulary, while emphasizing privacy, to educate women about breast health. The app features a breast cancer risk assessment, educational resources such as blogs, video demonstrations, and audio clips, a journaling feature for self-breast exams, and a geo-location service to connect users with nearby diagnostic centers.

Results: Since its launch in 2024, our PinkDetect application has been implemented in real-world settings, reaching over 10,000 women through medical camps, workshops, and focus groups. The app's beta version, currently available on the App Store, is designed for women of all ages, from teenagers to adults. We have held nine in-person workshops and camps at local sites, where we demonstrate the app to women while also educating them about breast cancer and teaching breast self-exam techniques. Notably, we led the first breast cancer awareness workshop tailored for visually impaired women, incorporating Braille resources to ensure accessibility.

Conclusion: PinkDetect is a free app that provides interactive guides using culturally appropriate, non-graphic images and easy-to-understand content tailored for South Asian women.

Inspiration: Factors such as lack of women's empowerment, social inequalities, and genetic risks have contributed to the growing burden of breast cancer in Pakistan. Digital health interventions for other non-communicable conditions, such as diabetes, have shown promise in improving early detection and outcomes. This suggests that PinkDetect, our culturally tailored mobile app, can impact breast health awareness in South Asia.

PinkDetect's engagement extends beyond digital platforms. It is deeply embedded in local communities through grassroots initiatives, including medical camps and workshops that empower underserved populations with crucial knowledge about breast health. Data from these efforts demonstrate their effectiveness: Before the sessions, only 30% of attendees were familiar with breast health practices. After the sessions, this number increased significantly to 92%, reflecting a strong foundation in breast self-examinations and early detection strategies.

Poster Snapshot

PinkDetect

A Digital Health Solution to Battling Stigma Against Breast Health Awareness in a Lower Middle-Income Country

Waqas S [1], Lalani S [2], Ebrahimi-Iranpour S [3]

[1]Aga Khan University, [2] Harvard University, [3] Toronto Metropolitan University

INTRODUCTION

In Pakistan, breast cancer represents a critical public health concern, marked by one of the highest mortality rates observed globally. Factors contributing to this dire situation include **insufficient awareness**, entrenched **social stigmas** about women's health, and **inadequate healthcare access**. In response, our initiative, PinkDetect, leverages a technology-driven approach to revolutionize access to breast health education and services.

METHODS

We employed a **community-first**, iterative approach to develop and implement PinkDetect:

- Conducted Focus Group Discussions
- Identified Social Taboos & Barriers
- Partnered with Local Organizations
- Designed & Built the PinkDetect App
- Deployed in Real-World Settings Through Grassroots Initiatives

RESULTS

Grassroots Initiatives through Camps & Workshops

We pioneered Pakistan's **first** breast health app, revolutionizing breast cancer awareness nationwide.

- **9+** Camps Conducted
- **10,000+** Women Reached
- **Karachi's 1st** workshop for Visually Impaired Women
- **92%** increase in awareness post-events
- Held in **rural** & **underserved** areas

Empowering Women Through the PinkDetect App

We have developed the **first** mobile application in Pakistan focused on breast health, designed to disseminate breast cancer education.

- **Risk Assessment Tool** — Understand personal risk
- **Educational Resources** — Localized, easy-to-read content
- **Self-Exam Journal** — Track monthly breast checks
- **Geolocation Tooling** — Nearby diagnostic centres with maps

INSPIRATION

The increasing burden of breast cancer in Pakistan requires concerted efforts. We sought technological solutions, that can impact the lives of individuals and communities.

Evidence from digital health interventions targeting other non-communicable diseases, like diabetes, have demonstrated efficacy. Such findings suggest that PinkDetect could influence breast cancer mortality rates through awareness across South Asia.

FUTURE RECCOMENDATIONS

- **Integration with Healthcare Services** — Cultivate partnerships with medical facilities to ensure uninterrupted access to breast health services
- **Partnerships with Educational Institutions** — Establish alliances with academia
- **Training for Healthcare Workers** — Deploy training programs to empower healthcare professionals in rural setups

CONCLUSION

PinkDetect is a non-profit organization that raises breast health awareness through camps and educational sessions. It also has an app with interactive guides that use culturally appropriate content designed for the South Asian community.

Award Winner: ***People's Choice-Best Overall Poster in All Categories by a Pre-Medical Student, Curriculum Development and Service Projects***

49

The Role of Social Determinants on Diabetes Management: How Housing Stability and Food Security Shape Outcomes in Low-Income Communities

Kaylynn Yune, **Toros Kehribarian**, **Anisha Shukla**, **Kian Chou**, **Manvel Bosnoyan**
[1]University of California, Berkeley

Biography: *Kaylynn is a second-year undergraduate student at the University of California, Berkeley, majoring in Molecular and Cell Biology. She is passionate about global health and finding sustainable solutions for communities facing health disparities. Her interest in diabetes management, particularly in underserved populations, grew from her experiences working on public health projects addressing health education and disease prevention. Kaylynn is especially focused on improving health outcomes for low-income communities, especially for women and children. She has volunteered at a pediatric office, which deepened her commitment to improving healthcare access. With a Background in health education, she is eager to apply her skills to research aimed at addressing healthcare inequities, such as those affecting diabetes management in low-income communities.*

Abstract

Background: Millions of Americans suffer from diabetes with the majority being type 2 diabetes. Existing research highlights the significant impact of social determinants of health on diabetes outcomes, yet, gaps remain in understanding how specific factors like housing stability and food security influence disease management in low-income patients. The Bay Area, despite its economic prosperity, has a significant number of low-income communities that face systemic barriers to healthcare, housing stability, and food security. Economic disadvantages often lead to inconsistent access to healthcare, limited diabetes education, and increased barriers to self-management. While studies show that lower socioeconomic status correlates with poorer glycemic control and higher complication rates, there is limited research on whether improving social conditions directly enhances diabetes outcomes. Addressing this gap is crucial for developing targeted interventions that support better disease management and health equity in underserved populations.

Methods: This study focuses on low-income adults in the Bay Area with type 2 diabetes. In collaboration with the Coalition of Concerned Medical Professionals, we will conduct an educational intervention for participants (ages 25–34) on diabetes management. Participants will complete a pre- and post-presentation Qualtrics survey assessing their knowledge and perceived barriers to management. A resource flyer on local housing and food security services will also be distributed. The effectiveness of the intervention will be evaluated based on changes in participants' understanding of diabetes management and available resources.

Results: Data collection is ongoing, with results expected before the conference. We will analyze shifts in participants' knowledge and awareness of diabetes management strategies and resources.

Conclusion: This study aims to identify key barriers to diabetes management in low-income communities and assess the impact of an educational intervention. By highlighting healthcare inequities, such as limited access to education and resources, we seek to inform future interventions addressing both medical and social determinants of health. Additionally, our literature review will explore racial and ethnic disparities in healthcare access and treatment outcomes.

Inspiration: Our passion for this project stems from witnessing the struggles of low-income communities managing diabetes despite living in a region of economic prosperity. By examining the role of socioeconomic factors in diabetes outcomes, we hope to contribute to public health strategies that reduce systemic healthcare disparities.

Award Winner: ***Advocacy, Grassroots, and Policy Projects***

4

Rates of Uninsurance as a Marker for Community Health in the State of Ohio

Ashni Patel[1], Bayley McRitchie
[1]Wright State University Boonshoft School of Medicine

Biography: *Ashni Patel is a first-year medical student at Wright State University Boonshoft School of Medicine.*

Abstract

Background: While there is a correlation between insurance rates and health outcomes, no study to date has investigated the use of insurance rates as a predictive marker for community health. This study investigates how rates of uninsurance in Ohio correlate with worse health outcomes, as well as how Ohio counties utilize health insurance data to examine trends regarding medical outcomes.

Methods: Our data came from County Health Rankings 2023. We explored the correlation between diabetes, preventable hospitalizations, premature deaths, and uninsurance rates using Pearson and Spearman correlations. We used one way ANOVA to compare uninsurance rates between Ohio and surrounding states. Paired t-tests were used to compare the trends in uninsurance rates in Ohio over time.

Results: We found a significant correlation ($r=0.327$, $p=0.002$) between rates of uninsurance and diabetes in Ohio, but found no correlation between uninsurance and other health indicators such as preventable hospitalizations, years of life lost, and diabetes rates among children. Ohio has similar uninsurance rates in comparison to Indiana, and both states have higher rates of uninsurance in comparison to Kentucky ($F=22.480$, $p=<0.001$). Additionally, Ohio's rate of uninsurance has increased between 2016 and 2023 ($t=-40.63$, $p=<.001$). There was no statistical difference found between uninsurance rates and years of life lost or uninsurance among children and adulthood diabetes within the state of Ohio.

Conclusion: Our study established that in Ohio, uninsurance is correlated with adult diabetes, but other poor health outcomes were not correlated. This suggests that states should consider looking at local data for community-specific markers. Additionally, this could mean that diabetes is left untreated in uninsured populations while other health problems are better managed. Future studies should continue to explore not only community markers of health but also detriments of uninsurance.

Inspiration: When choosing a topic, we knew that we wanted to determine what tangible effects are seen with a lack of access to health insurance. There has been more conversation in the last decade about the US health system and how many Americans do not have access to proper care. We sought to determine if there was a correlation between health outcomes and a lack of access in hopes of drawing attention to adverse effects brought on by systemic shortcomings. While we only found a potential link, we hope these findings inspire further studies to be done and allow those in medicine to address the barriers and improve community health outcomes.

Award Winner: ***Basic and Translational Science Projects***

14

Differential expression of senescence markers in human diabetic kidney disease: a digital spatial profiling study

Farha Deceus[1], Dr Khaled Elhusseiny[2], Dr Lynn Cornell[3], Dr Xiaohui Bian[2], Yaohua Ma[4], Jennifer Kachergus[5], Dr Aubrey Thompson[5], Dr LaTonya Hickson[2]

[1]Mayo Clinic Alix School of Medicine, [2]Division of Nephrology and Hypertension, Department of Medicine, Mayo Clinic, [3]Department of Laboratory Medicine and Pathology, Mayo Clinic, [4]Division of Biomedical Statistics, Mayo Clinic, [5]Department of Cancer Biology, Mayo Clinic

Abstract

Biography: *Farha Deceus is a fourth-year medical student at the Mayo Clinic Alix School of Medicine in Jacksonville, FL. This year, she matched to the Mayo Clinic in Arizona for her Internal Medicine residency training and is interested in pursuing a Nephrology fellowship. She has lived in Florida for most of her life having been raised in southwest Florida and attending the University of Florida for her undergraduate studies. In her free time, she enjoys spending time with loved ones, trivia, and live artistic events such as concerts, musicals/plays, and museums.*

Background: Cellular senescence, or irreversible cell cycle arrest without apoptosis, is garnering ever-increasing attention as a driver of diabetic kidney disease (DKD) pathogenesis and later fibrosis. Despite this, few studies have examined differences in the quantitative and spatial distribution of protein markers associated with senescence. We tested the hypothesis that human kidney tissue in DKD has a pro-senescence profile distinct from normal histology but similar to tubulointerstitial nephritis (TIN), another pro-inflammatory kidney pathology.

Methods: NanoString GeoMx Digital Spatial Profiling technology identified oligonucleotide-labeled antibodies in kidney core biopsy samples [DKD (n=5), TIN (n=4), and normal (n=2)] within regions of interest selected based on kidney compartments (glomeruli, tubules, interstitium). The differential expression of proteins of interest was analyzed using linear mixed modeling.

Results: In DKD tubulointerstitium (vs. normal), markers of cell cycle arrest (PTEN, Phosphorylated RSK and GSK), senescence-associated secretory phenotype (SASP; EGFR, Ms.IgG1, S100B), anti-apoptosis (BCL-2, Cleaved Caspase 9), nuclear changes (Histone H3), DNA damage (PARP), and metabolic changes (S6) were significantly increased with p-values <.05. In DKD glomeruli (vs. normal), markers of cell cycle arrest (Ki-67), SASP (fibronectin), and signaling (NF1) were increased. In contrast, some markers of cell cycle arrest (p53, EpCAM) and metabolic changes (GAPDH) were increased across all compartments in normal tissue (vs. DKD).

When comparing DKD to TIN, no differences in expression were apparent in the glomeruli. In DKD tubulointerstitium, markers of cell cycle arrest (EpCAM), SASP (Ms.IgG1), and pro-fibrosis (SMA) showed increased expression, compared to increased cell cycle arrest marker Ki.67 in TIN tubulointerstitium.

Conclusions: Senescence-related and pro-fibrotic markers were higher across all compartments in DKD compared to normal kidney tissue, with the tubulointerstitium as the primary site where this was observed. Compared to TIN, there were no differences in marker expression in DKD glomeruli but slightly increased expression in the tubulointerstitium. Therefore, therapies targeting senescent cells may have a role in the future of DKD management.

Inspiration: Unfortunately, DKD is a common microvascular complication of diabetes mellitus. With the increasing prevalence of both these morbid conditions, there exists a need for more treatment options to prevent progression to end-stage kidney disease. However, appropriate drug targets must first be identified to develop new therapies. The goal of this study was to add to the body of evidence implicating senescence in DKD pathogenesis as well as reporting novel data on the spatial distribution of previously identified senescence-related markers.

Poster Snapshot

Differential expression of senescence markers in human diabetic kidney disease: a digital spatial profiling study

Farha Deceus, B.S.[1], Khaled Elbassiony, M.B.B.Ch.[2], Lynn Cornell, M.D.[3], Xiaohui Bian, M.D., Ph.D.[3], Yaohua Ma, M.S.[4], Jennifer Kachergus, M.S.[4], Aubrey Thompson, Ph.D.[4], LaTonya Hickson, M.D.[2]
[1]Mayo Clinic Alix School of Medicine, [2]Division of Nephrology and Hypertension, Mayo Clinic Florida, [3]Department of Laboratory Medicine and Pathology, Mayo Clinic Minnesota, [4]Division of Biomedical Statistics, Mayo Clinic Florida, [5]Department of Cancer Biology, Mayo Clinic Florida

BACKGROUND

Cellular senescence, or irreversible cell cycle arrest without apoptosis, is garnering ever increasing attention as a driver of diabetic kidney disease (DKD) pathogenesis and later fibrosis. Despite this, few studies have examined differences in quantitative and spatial distribution of protein markers associated with senescence.

We tested the hypothesis that human kidney tissue in DKD has a pro-senescence profile that is distinct from normal histology but similar to tubulointerstitial nephritis (TIN), another pro-inflammatory kidney pathology.

METHODS

NanoString GeoMx® Digital Spatial Profiling technology identified oligonucleotide-labeled antibodies in kidney core biopsy samples [DKD (n=5), TIN (n=4), and normal (n=2)] within regions of interest (ROI) selected based on kidney compartments (glomeruli, tubules, interstitium). The differential expression of proteins of interest was analyzed using linear mixed modeling.

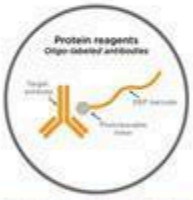


IMAGE 1: Borrowed from *GeoMx® DSP: A Flexible & Scalable Platform for Spatial Biology*[1]

©2025 Mayo Foundation for Medical Education and Research

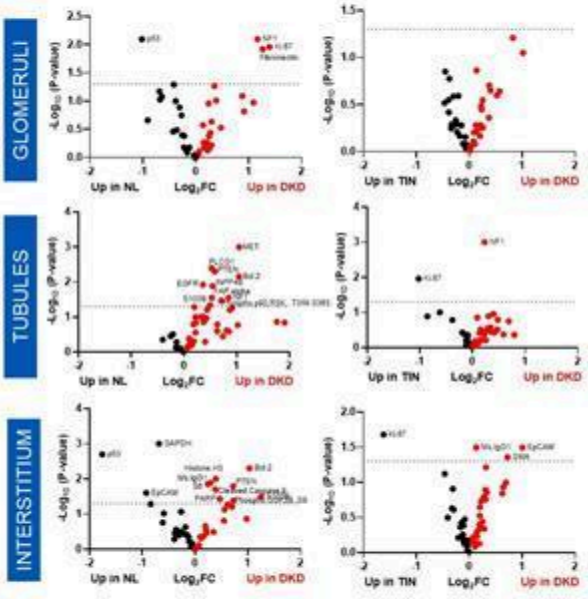


FIGURE 1: Senescent cell marker differential distributions in the glomerular, tubular, and interstitial compartments of Normal, DKD, and TIN kidney tissue.

Volcano plots display differential expression of senescence associated proteins. Data are displayed as Log2 Fold Change (Log2FC). Comparison analyses are shown for DKD vs. NL [left] and DKD vs. TIN [right]. DKD: diabetic kidney disease; NL: normal kidney tissue; and TIN: tubulointerstitial nephritis.

RESULTS

Categories after previously described Nine Hallmarks of Senescence[2]

Markers increased in DKD vs NL
- Cell cycle arrest (GSK, KI-67, PTEN, Phosphorylated RSK)
- DNA damage response (PARP)
- Nuclear changes (Histone H3)
- Anti-apoptotic factors (BCL-2, Cleaved Caspase 9)
- Senescence-associated secretory phenotype (SASP, EGFR, fibronectin, Ms IgG1, S100B)
- Metabolic changes (S6)
- Changes in signaling (hIF1)

Markers increased in DKD vs TIN
- Cell cycle arrest (EpCAM)
- SASP (Ms IgG1)
- Pro-fibrosis (SMA)

CONCLUSIONS

- Senescence-related and pro-fibrotic markers were higher across all compartments in DKD compared to normal kidney tissue, with the tubulointerstitium as the primary site this difference was observed.
- Compared to TIN, there were no differences in protein marker expression in the glomerull but slightly increased expression in the tubulointerstitium.
- Therapies targeting senescent cells will likely play a role in the future of DKD management.

REFERENCES

1. GeoMx DSP Overview. NanoString. https://nanostring.com/products/geomx-digital-spatial-profiler/geomx-dsp-overview/
2. Suryadevara, V., Hudgins, A.D., Rajesh, A. et al. SenNet recommendations for detecting senescent cells in different tissues. Nat Rev Mol Cell Biol 25, 1001–1023 (2024).

Award Winner: ***AMSA Academy Scholars Programs and Institutes Participant Projects***

8

Unprepared and Unsupported: Moral Injury Among Medical Students in the Dominican Republic

Yoalkris Salcedo[1]
[1]Universidad Iberoamericana

Biography: *Yoalkris Salcedo is a fourth-year medical student at Universidad Iberoamericana (UNIBE) in Santo Domingo, Dominican Republic. With an interest in general surgery, she has participated in clinical research on surgical outcomes, patient quality of life, and the physician-patient relationship. As a Project IMG ambassador, she collaborates with peers and mentors through conferences and research initiatives to foster inclusivity in medicine. Outside of medicine, she is a certified coffee barista who enjoys blending craft and community, one cup at a time.*

Abstract

Background: Moral injury occurs when medical students witness or participate in actions that conflict with their ethical beliefs. These experiences often stem from institutional policies, systemic issues, and hierarchical pressures. This study explores the prevalence of moral injury among medical students in the Dominican Republic, the types of ethical dilemmas they face, and the personal and professional consequences. A central focus is the lack of institutional support and its effect on student well-being and identity formation.

Methods: A cross-sectional electronic survey was distributed to medical students in clinical rotations across the Dominican Republic. Administered in English and Spanish, the survey collected both quantitative and qualitative data across five domains: experiences with moral injury, ethical dilemmas, perceived institutional support, confidence in managing such challenges, and proposed support strategies. After providing consent, participants were presented with a definition of moral injury, including clinical examples, before responding.

Results: Of the 127 students who completed the survey, 82 (65.6%) reported experiencing moral injury, 15 (12%) had not, and 28 (22.4%) were unsure. Two were excluded for lack of consent, resulting in a final sample of 125. The primary analysis focused on the 82 students who experienced moral injury. Most (86.6%) had received no formal education on the topic, and many reported no access to mentorship or counseling. Students rated their confidence in managing dilemmas at 2.6/5 and institutional support at 1.6/5. Nearly 75% felt the profession does not adequately address moral injury. Several noted that these experiences negatively shaped their view of medicine and influenced their specialty choices.

Conclusions: Moral injury is a critical yet overlooked issue in medical education. Without institutional support, students are left to navigate ethical distress alone, placing them at risk for long-term psychological and professional harm. Medical schools must implement formal education on moral injury, establish accessible support systems, and create safe spaces for students to reflect and process. Addressing these gaps is essential for fostering ethical resilience and long-term well-being in future physicians.

Inspiration: This study was inspired by my own clinical experiences. I often encountered ethical dilemmas I couldn't name until I joined AMSA's Medical Humanities Scholars Program and learned about moral injury. The emotional weight of those moments stayed with me, and I often wondered if others were feeling the same way but had no outlet to talk about it. That sense of shared but unspoken struggle is what motivated me to explore this topic.

Poster Snapshot

Unprepared and Unsupported: Moral Injury Among Medical Students in the Dominican Republic

Yoalkris E. Salcedo[1]
[1]Universidad Iberoamericana (UNIBE), School of Medicine, Santo Domingo, Dominican Republic

Introduction

Moral injury occurs when individuals witness or participate in actions that violate their moral or ethical beliefs[1]. In healthcare, it often results from hierarchical dynamics, institutional pressure, or being a silent observer[2]. This study explored the prevalence of moral injury among medical students in the DR, the ethical dilemmas they faced, and the personal and professional effects.

Methodology

- A cross-sectional electronic survey was distributed to medical students in clinical rotations across the Dominican Republic.
- Administered in English and Spanish.
- Quantitative and qualitative data were collected across five domains: moral injury experiences, ethical dilemmas, institutional support, confidence in managing such challenges, and proposed support strategies.
- Following informed consent, participants were presented with a definition of moral injury, including clinical examples, prior to reporting their experiences.
- Complete survey instrument is available via QR code.

Results

- Of the 127 students who completed the survey:
  - 82 reported experiencing moral injury (65.6%)
  - 15 indicated they had not (12%)
  - 28 were unsure (22.4%)
- Two students did not provide consent and were excluded, resulting in a final sample of 125.
- The primary analysis was based on the 82 students who reported experiencing moral injury.
- 86.6% had no formal education on moral injury.
- Most lacked access to mentorship or counseling, echoing concerns in global literature about the absence of ethical support systems[4].
- Confidence in managing dilemmas: 2.6/5
- Institutional support rating: 1.6/5
- 74.8% felt the profession does not adequately address moral injury, mirroring global patterns of ethical isolation[3].
- Many students said these experiences negatively impacted their outlook on medicine and even influenced their specialty choice[5].

Figure 1. Moral Injury Among Medical Students

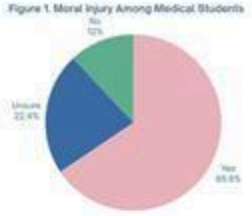
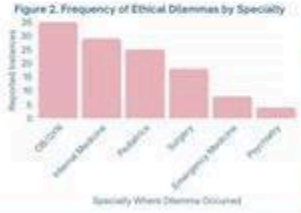


Figure 2. Frequency of Ethical Dilemmas by Specialty



Conclusion

These findings highlight the urgent need to address the structural contributors to moral injury within clinical education. As previous studies have shown, repeated exposure without institutional support can result in moral residue and long-term harm[4]. System-level reform should be paired with efforts to equip students to recognize and manage ethical distress. Medical schools must integrate formal education on moral injury[1], provide accessible support systems, and create safe, reflective spaces for students. These actions are essential to fostering resilience, ethical integrity, and long-term physician well-being[3].

Implications for Research

Future research could explore longitudinal outcomes of moral injury in medical students, including its impact on career trajectory, burnout, and professional identity formation. Additionally, comparative studies across institutions or countries could shed light on how different educational environments mitigate or exacerbate ethical distress. Evaluating the effectiveness of targeted interventions, such as ethics curricula, peer support groups, or institutional debriefing sessions, also represents a promising area for further investigation.

Inspiration

This study was inspired by my own clinical experiences. I often encountered ethical dilemmas I couldn't name until I joined AMSA's Medical Humanities Scholars Program and learned about moral injury. The emotional weight of those moments stayed with me, and I often wondered if others were feeling the same way but had no outlet to talk about it. That shared but unspoken struggle is what motivated me to explore this topic.

References

Scan to access the survey instrument and references.

Take This With You

Scan for reflective tools, readings, and ways to take action.

Award Winner: ***Chapter Activities Projects***

21

Evaluation of the Heart Health Fair and Its Effectiveness in Public Health Initiatives/ screening by Medical Students

Rhieya Rahul[1], **Mr Atharv Katam**[1], **Ms Khushboo Gupta**[1]
[1]Royal College of Surgeons in Ireland

Biography: *Rhieya Rahul is an enthusiastic second-year medical student at RCSI University of Medicine and Health Sciences in Dublin, Ireland. A dedicated and motivated individual, she excels in teamwork, communication, and meticulous attention to detail. Her passion for medicine is reflected in extensive observerships across multiple specialties, from obstetrics and gynecology at Latifa Hospital in Dubai to virtual shadowing programs with Medicine Academy. She has observed a wide range of medical procedures, including laparoscopic hysterectomies, endometriosis surgeries, and cesarean sections.Rhieya is deeply involved in research, focusing on areas like reproductive health, robotic-assisted surgery, and public health initiatives. She has contributed to projects on maternal health, lung cancer awareness, and effective communication in healthcare, and is currently a peer reviewer for the Student Medical Journal. A committed advocate for social change, Rhieya volunteers with organizations such as Plan Ireland, Childline, and the Irish Cancer Society. She also contributes to initiatives like Empower Her and the Autistic Art Club, promoting gender equality and neurodiversity awareness. In leadership roles, she serves on core committees for various societies at RCSI, including AMSI, Red Cross, and UNICEF. Rhieya's passion for education is evident in her tutoring roles with Medefine and Revision Dojo, where she mentors students aspiring to enter medical school. She has also led research projects in public and maternal health and participated in global conferences on gender equality and women in surgery. Her diverse experiences, from teaching and research to advocacy and leadership, reflect her dedication to making a positive impact in healthcare and society.*

Abstract

Background: A student-led Heart Health Fair was developed to address the dual challenges of limited clinical exposure for medical students and the need for accessible cardiovascular health screenings in underserved communities. The initiative aimed to provide comprehensive cardiovascular risk assessments, with medical students conducting screenings under professional supervision, while simultaneously offering early clinical experience for trainees. The program sought to identify cardiovascular risk factors, improve community health knowledge, and enhance medical students' clinical skills through a supervised community health intervention.

Methods: We conducted a literature review across PubMed, Cochrane Library, MEDLINE, CINAHL, and EMBASE to synthesize research on cardiovascular screening and student-led health initiatives. Two independent reviewers screened results using the PICO framework, ensuring rigorous selection of relevant English-language studies with no date restrictions. The Heart Health Fair, a cross-sectional observational study in Dublin, involved 200 community participants and 72 medical student volunteers from RCSI Dublin, utilizing a systematic four-station workflow for screening. Students underwent training to standardize techniques, with quality control measures including equipment calibration, hygiene protocols, and professional supervision to ensure accurate data collection and participant safety.

Results: The Heart Health Fair 2024, supported by studies from Vu et al., Wu et al., Herrera, Fischbein, Cappetto et al., and Alzeera et al., engaged 72 volunteers across academic years. Students reported significant confidence in clinical skills, with 96.8% rating the experience as beneficial for personal learning. The program served 200 patients, of which 45 filled out a satisfaction survey with 93% reporting being "Very Satisfied" overall and 98% very satisfied with student interactions. The research demonstrated the potential of student-run clinics to provide healthcare services while offering crucial experiential learning for medical students.

Conclusion: The Heart Health Fair enhanced medical education and community health by providing hands-on clinical experience and raising cardiovascular awareness. It fostered interdisciplinary collaboration while highlighting the importance of early screening. Despite limitations, it underscored the value of student-led public health interventions.

Inspiration: Our passion stems from addressing cardiovascular disease prevention through early intervention and community empowerment. By bridging medical education with public health, we sought to create impact beyond traditional learning. Our findings suggest student-led initiatives can provide accessible preventive healthcare and enhance medical training. These programs offer a scalable, cost-effective model for community engagement, potentially transforming preventive medicine and education. Empowering future healthcare professionals to engage in community health fosters a symbiotic relationship between medical training and public service.

Award Winner: ***Community Development and Service Projects***

23

Improving Health Equity: Tailored Services for Addressing Disparities in Underserved Asian Communities

Jaishree Ramamoorthi[1], **Ashanti Ambriz**[1], **KG Samford**[1], **Zibiah Ho**[1]
[1]University of California, Davis

Biography: *Jaishree Ramamoorthi, Ashanti Ambriz, KG Samford, and Zibiah Ho are undergraduate students at the University of California, Davis, and serve as Undergraduate Co-Directors of the Paul Hom Asian Clinic. This student-run clinic, affiliated with the UC Davis School of Medicine, has been providing healthcare to underserved Asian populations in the greater Sacramento area since its founding in 1971. As the oldest continuously operating Asian clinic in the United States, the Paul Hom Asian Clinic operates as a 501(c)(3) nonprofit organization. It is dedicated to offering free, linguistically and culturally sensitive healthcare to uninsured and underserved Asian communities, while welcoming patients of all Backgrounds.The clinic's multidisciplinary team, including physicians, professional students, and undergraduate Patient Advocates, comes together every Saturday to deliver a wide range of primary and specialty care services. These services include psychiatry, hepatitis and diabetes care, cardiopulmonary services, women's health, and more. In addition, the clinic helps qualifying patients access health insurance and affordable prescription medications. Jaishree, Ashanti, KG, and Zibiah are passionate about continuing the legacy of Dr. Paul Hom by addressing healthcare disparities and fostering health equity within the community. Through their leadership, they strive to uphold the clinic's mission of compassion and service while connecting patients to vital healthcare resources.*

Abstract

Background: Our project was initiated to address the health and wellness challenges faced by the Asian community, particularly those without access to adequate healthcare. As a 501(3)(c) student-run clinic, we are dedicated to providing holistic care that addresses the physical health concerns of our patients, and their mental & emotional well-being. Many of our services focus on bridging gaps in healthcare needs specific to the Asian population, such as hepatitis and diabetes management, as well as de-stigmatizing mental health services.

Methods: Undergraduate volunteers help translate various languages to accommodate our diverse patient population. This includes Mandarin, Cantonese, Taishanese, Korean, Vietnamese, Mongolian, and Spanish. Local community outreach and health events have expanded the number and demographic of patients we see each year. After each clinic, we record how many patients were seen, their language, insurance status, and various health screening questions. All new patients are screened for Hepatitis through blood tests and given psychiatric questionnaires (PHQ-9 and GAD-7) in their preferred language.

Results: Our clinic serves approximately 250 patients every 10 weeks (roughly 35% Chinese, 30% English, 25% Vietnamese, 7% Spanish, and 3% speaking other languages). Continuity of care is strengthened through specialty service follow-ups, such as diabetes and hepatitis monitoring due to the Asian community's higher susceptibility. Establishing the Psychiatry Committee has increased follow-up mental health services and patient engagement. Online lab-ordering implementation has proven effective and inspired transitioning to electronic medical records (EMR), which is ongoing and monitored throughout the year.

Conclusion: Although we primarily focus on the Asian community, we have expanded our services to individuals from various cultural and ethnic backgrounds. We achieved this by fostering a collaborative environment where undergraduates, medical students, and physicians volunteer their time and expertise to offer free, comprehensive support. Our main goal is to create a space where patients feel heard, supported, and empowered to address their healthcare needs in a compassionate, culturally sensitive manner.

Inspiration: Our passion to serve the underserved Asian population illustrated the barriers and health disparities preventing their access to adequate healthcare. The prevalence of Hepatitis B for Asians is relatively high compared to other ethnic groups. To break these barriers, our undergraduates provide interpretation services to bridge the understanding between patients and healthcare providers. Our services are at no cost to support anyone seeking healthcare. Providing culturally competent and accessible care to everyone is critical for the future of medicine.

Poster Snapshot

Improving Health Equity: Tailored Services for Addressing Disparities in Underserved Asian Communities

Ramamoorthi J., Ambriz A., Samford K., Ho Z.
University of California, Davis

Introduction

Paul Horn Asian Clinic was founded in 1971, with the mission to serve the underserved Asian community in Sacramento who lacks adequate healthcare due to cultural, economic, and language barriers. Undergraduate students, PA students, medical students, phlebotomists, dietitians, and physicians volunteer on Saturdays to provide healthcare and interpretation services at no cost. We have 10 different health committees, including Covered California, Hepatitis, and Psychiatry, offering various specialty care services to patients.

Objective

How has Paul Horn Asian Clinic addressed health disparities in the underserved Asian population in the Greater Sacramento area?

- Patient demographics (language and insurance status)
- Hepatitis & psychiatry services
- Health Fair patient growth

How can we improve our services in the future?

Methods

To keep track of our total patient count, a database is updated after each clinic to show how many total patients we have seen, their insurance status, and preferred language. Similarly, our hepatitis committee maintains its own database, ensuring all new patients are screened for hepatitis through diagnostic tests. From there, we follow up accordingly, such as by referring them for liver ultrasounds or having them attend our free vaccination clinics.

This past year, we have developed and expanded our psychiatry committee to bridge the gap between our patient population and receiving mental health support. We screen all our patients using the PHQ9 and GAD7 forms and follow up with patients who may need extra support through our monthly psychiatry specialty clinics.

We host an annual Health Fair at the UC Davis School of Medicine, where we provide all of our specialty services in one visit. Additionally, we held health workshops throughout the event, such as stretching, tai chi, and healthy eating habits.

UCDAVIS
UNIVERSITY OF CALIFORNIA

Results

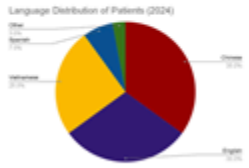


Figure 1. Language Distribution of Patients
This pie chart shows the primary languages spoken by patients, with Chinese (35%), English (30%), and Vietnamese (25%) being the most common.

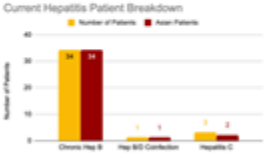


Figure 3. Hepatitis Patient Breakdown
This bar chart shows hepatitis cases by type and racial distribution. Chronic hepatitis B cases are exclusively among Asian patients, emphasizing a key health disparity.

Figure 5. Health Fair Attendance Over Time
This chart shows health fair attendance growth, doubling from 40 in 2022 to 83 in 2024, reflecting increased community engagement.

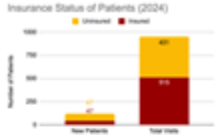


Figure 2. Insurance Status of Patients
This stacked bar chart compares insured vs. uninsured patients for new enrollments and total visits, highlighting the clinic's role in serving uninsured populations.

Figure 4. Psychiatry Patient Score Distribution
This bar chart categorizes psychiatric patients by severity, showing that 18 have high-priority scores (>20), while 35 fall into the moderate range (12-20).

The results illustrate that the clinic primarily serves uninsured patients, specifically Chinese (Cantonese & Mandarin), Vietnamese, and English speaking patients. With the exception of one patient, all patients actively being treated for hepatitis in the clinic are of Asian background. The addition of the Psychiatry Committee has resulted in 251 patients added to the database, with 53 being closely monitored for psychiatry concerns. Health Fair attendance has doubled in April 2024 compared to the previous one held in October 2022.

Conclusion & Future Directions

The clinic continues to expand its services to individuals of all backgrounds while addressing the specific health needs of the Asian community, as seen with the Psychiatry and Hepatitis Committees, as well as outreach programs such as the Health Fair.

As Paul Horn Asian Clinic grows, we are focusing on EMR (Electronic Medical Records) implementation and expanded patient outreach to improve accessibility for underserved Asian communities in Sacramento. EMR systems will securely manage patient information and have multilingual capabilities, allowing patients to access records in languages like Chinese, Vietnamese, and Korean. This will bridge language barriers and ensure better understanding of care plans.

For outreach, we plan to engage directly with the community by setting up informational stands at local Asian supermarkets. These will provide health resources, promote clinic services, and help recruit new patients, especially those unaware of our free care. By enhancing EMR capabilities and outreach efforts, we aim to increase patient engagement, improve health literacy, and reduce healthcare disparities, ultimately providing more equitable care tailored to community needs.

Award Winner: ***Curriculum Development and Educational Projects***

47

The Impact of Combined Mandatory and Optional Mindfulness-Based Interventions on Stress Levels in First-Year Medical Students

Sonali Notani[1], **Karina Butani**[1]
[1]Tulane University School of Medicine

Biography: *Sonali is a second-year medical student at Tulane University Medical School. She is originally from Dallas, Texas and has lived in New Orleans for the past four years. Sonali was the 2024 president of the AMSA chapter at Tulane University where she planned and held events for the student body addressing social determinants of health, mental health and incarceration, and reproductive rights in Louisiana. Sonali is a site-coordinator for NOARHP, a program providing sex education at various schools in New Orleans and a clinic leader at the homeless shelter Ozanam Inn where she provides STD and hepatitis C testing. Outside of school, Sonali enjoys meditation, exercising, cooking, and volunteering.*

Karina is a second-year medical student at the Tulane University School of Medicine from the Bay Area, California. Karina currently serves as a clinic leader for Acacia, an organization that provides screening services for sexually transmitted infections, including hepatitis C, syphilis, and HIV. She is actively involved in the TUSOM student admissions interview committee and serves on the executive board of the Culinary Medicine Society, reflecting her passion for promoting health and nutrition within the local community. In her free time, Karina loves trying new recipes, practicing pilates, singing, traveling, and spendin*g time with her friends and family.*

Abstract

Background: Medical students experience high rates of burnout and stress, leading to an increased interest in mindfulness interventions. However, variability among mindfulness program structure and length across institutions creates challenges to assess long-term effectiveness. This study seeks to integrate mindfulness into the medical school curriculum as a mandatory intervention for first-year medical students with optional follow-up interventions.

Methods: The study included first-year medical students from the classes of 2026 and 2027 who participated in a one-hour mindfulness meditation session. Pre- and post- session surveys anonymously assessed students' stress levels on a scale from 1-10, and a follow-up survey was distributed to students three months later. Data analysis involved paired t-tests to measure stress reduction and qualitative feedback was categorized to reflect student perceptions.

Results: The class of 2026 (n=111) and 2027 (n=130) exhibited significant reductions in self-reported stress levels following the mindfulness sessions. The mean stress level decreased from 5.86 (±2.21) to 3.94 (±2.27) for the class of 2026 ($p<0.001$) and from 5.5 (±1.91) to 3.57 (±2.02) for the class of 2027 ($p<0.001$). At the three-month follow-up, 75% of the Class of 2026 and 58% of the Class of 2027 students reported practicing mindfulness since the session, with feedback highlighting increased relaxation and enhanced focus.

Conclusion: This study revealed significant short-term benefits in reducing stress levels among first-year medical students. The results demonstrate that even a one-hour mandatory session was beneficial to students with rigorous schedules, and many claimed they continue to incorporate mindfulness into their routine. While this study displays potential for mandatory mindfulness curriculums to be incorporated into additional medical schools, further research may assess long-term impacts on mental health and academic performance.

Inspiration: This project was inspired by the growing recognition of mental health challenges and stress-related burnout faced by medical students. As future physicians, we believe that promoting emotional resilience and well-being is crucial in caring for our patients. We assert that integrating mindfulness into the curriculum offers a unique opportunity for students to learn a new stress management technique, improving their experience in medical school and preparing them for the emotional demands of patient care. With further studies conducted on mindfulness-based interventions in schools, the broader implication would be to create a culture of well-being among healthcare professionals to benefit practitioners as well as their patients.

Award Winner: ***Global Autoimmune Institute Projects***

53

Skin of Color Specifications in Visible Light Phototherapy for Immune-Mediated Dermatological Conditions: Psoriasis, Vitiligo, and Atopic Dermatitis

Sooin Choi, Taylor Murphy, Priya Patel, Matthew Hoffman, Guneet Shah, Tyler Wong, Kurt Ashack, M.D.
[1]Michigan State University College of Human Medicine

Biography: *Sooin Choi, M.D. Candidate 2027, is a second-year medical student at Michigan State University College of Human Medicine in Grand Rapids, MI. She earned her Bachelor of Science in Neuroscience, with a Minor in Social Class and Inequality, from the University of Michigan in Ann Arbor, MI. Sooin's academic interests focus on the intersection of dermatology, psychiatry, and allergy/immunology, with a particular emphasis on how access to insurance, or lack thereof, impacts health outcomes. Her long-term goal is to integrate her diverse interests and drive change in healthcare accessibility and patient care.*

Abstract

Background: Visible light therapy (380-700 nm) has shown promise in treating immune-mediated dermatological conditions, such as psoriasis, vitiligo, and atopic dermatitis, but studies often overlook skin of color populations. Melanin, the pigment in skin, absorbs light across a wide range of wavelengths (200–900 nm), resulting in differences in light absorption across skin tones. The goal of this review is to explore whether studies (1) include skin of color individuals in their trials and (2) if specific considerations are recommended to optimize treatment outcomes for these populations.

Methods: A search was conducted on PubMed in February 2025, limited to English-language studies, focusing on visible light therapies (blue, red, and LED light) for psoriasis, vitiligo, and atopic dermatitis. The search identified 158 studies, including randomized controlled trials (RCTs) and clinical trials. Studies will be selected based on predefined criteria, excluding non-visible light therapies, non-human studies, and non-English publications. Data will be extracted and analyzed descriptively, with results presented narratively. No significant deviations from the methodology are expected.

Results: The search identified [X] studies that meet the inclusion criteria. These studies, including RCTs and clinical trials, explored the use of visible light therapy for the selected dermatological conditions. Study characteristics such as therapy type (e.g., blue light, red light, LED), sample size, and treatment protocols will be summarized following data extraction.

Conclusion: This review seeks to evaluate the use of visible light therapy for immune-mediated dermatological conditions in individuals with varying skin tones. The findings will highlight gaps in research regarding the inclusion of skin of color populations and provide insights into necessary treatment modifications. Future research should focus on standardizing treatment protocols and further exploring the efficacy of visible light therapy for diverse populations.

Inspiration: This project was inspired by the underrepresentation of skin of color populations in dermatological research, particularly in autoimmune conditions like vitiligo and psoriasis, where individuals with darker skin tones often experience more pronounced symptoms. The findings in this review could help advance personalized dermatological care and ensure that all individuals with varying skin tones benefit equally from therapeutic advancements.

Award Winner: ***International Impact Projects***

58

PinkDetect: A Digital Health Solution to Battling Stigma Against Breast Health Awareness in a Lower Middle-Income Country

Syed Waqas[1], Ms. Suha Lalani, Ms. Solmaz Iranpour
[1]Aga Khan University

Biography: *A final-year medical student at Aga Khan University, who is passionate about bridging the communication gap in healthcare, particularly for marginalized communities. As chief medical consultant at PinkDetect, he ensures the app is jargon-free and accessible to all users.*

Abstract

Background: In Pakistan, breast cancer poses a severe public health challenge, with one of the highest mortality rates globally. The factors contributing to these alarming statistics include inadequate awareness, prevailing social stigmas regarding women's health, and limited access to healthcare services. Addressing these issues, our solution, PinkDetect, employs a technology-driven approach to democratize breast health awareness.

Methods: We have developed the first mobile application in Pakistan focused on breast health, designed to disseminate breast cancer education. After conducting focused group discussions, we identified social taboos as a major barrier to addressing this issue. To overcome this, we utilized socially acceptable images and vocabulary, while emphasizing privacy, to educate women about breast health. The app features a breast cancer risk assessment, educational resources such as blogs, video demonstrations, and audio clips, a journaling feature for self-breast exams, and a geo-location service to connect users with nearby diagnostic centers.

Results: Since its launch in 2024, our PinkDetect application has been implemented in real-world settings, reaching over 10,000 women through medical camps, workshops, and focus groups. The app's beta version, currently available on the App Store, is designed for women of all ages, from teenagers to adults. We have held nine in-person workshops and camps at local sites, where we demonstrate the app to women while also educating them about breast cancer and teaching breast self-exam techniques. Notably, we led the first breast cancer awareness workshop tailored for visually impaired women, incorporating Braille resources to ensure accessibility.

Conclusion: PinkDetect is a free app that provides interactive guides using culturally appropriate, non-graphic images and easy-to-understand content tailored for South Asian women.

Inspiration: Factors such as lack of women's empowerment, social inequalities, and genetic risks have contributed to the growing burden of breast cancer in Pakistan. Digital health interventions for other non-communicable conditions, such as diabetes, have shown promise in improving early detection and outcomes. This suggests that PinkDetect, our culturally tailored mobile app, can impact breast health awareness in South Asia.

PinkDetect's engagement extends beyond digital platforms. It is deeply embedded in local communities through grassroots initiatives, including medical camps and workshops that empower underserved populations with crucial knowledge about breast health. Data from these efforts demonstrate their effectiveness: Before the sessions, only 30% of attendees were familiar with breast health practices. After the sessions, this number increased significantly to 92%, reflecting a strong foundation in breast self-examinations and early detection strategies.

Poster Snapshot

PinkDetect

A Digital Health Solution to Battling Stigma Against Breast Health Awareness in a Lower Middle-Income Country

Waqas S [1], Lalani S [2], Ebrahimi-Iranpour S [3]

[1]Aga Khan University, [2] Harvard University, [3] Toronto Metropolitan University

INTRODUCTION

In Pakistan, breast cancer represents a critical public health concern, marked by one of the highest mortality rates observed globally. Factors contributing to this dire situation include **insufficient awareness**, entrenched **social stigmas** about women's health, and **inadequate healthcare access**. In response, our initiative, PinkDetect, leverages a technology-driven approach to revolutionize access to breast health education and services.

METHODS

We employed a **community-first**, iterative approach to develop and implement PinkDetect:

- Conducted Focus Group Discussions
- Identified Social Taboos & Barriers
- Partnered with Local Organizations
- Designed & Built the PinkDetect App
- Deployed in Real-World Settings Through Grassroots Initiatives

RESULTS

Grassroots Initiatives through Camps & Workshops

We pioneered Pakistan's **first** breast health app, revolutionizing breast cancer awareness nationwide.

- **9+** Camps Conducted
- **10,000+** Women Reached
- **Karachi's 1st** workshop for Visually Impaired Women
- **92%** increase in awareness post-events
- Held in **rural** & **underserved** areas

Empowering Women Through the PinkDetect App

We have developed the **first** mobile application in Pakistan focused on breast health, designed to disseminate breast cancer education.

- **Risk Assessment Tool** — Understand personal risk
- **Educational Resources** — Localized, easy-to-read content
- **Self-Exam Journal** — Track monthly breast checks
- **Geolocation Tooling** — Nearby diagnostic centres with maps

INSPIRATION

The increasing burden of breast cancer in Pakistan requires concerted efforts. We sought technological solutions, that can impact the lives of individuals and communities.

Evidence from digital health interventions targeting other non-communicable diseases, like diabetes, have demonstrated efficacy. Such findings suggest that PinkDetect could influence breast cancer mortality rates through awareness across South Asia.

FUTURE RECCOMENDATIONS

- **Integration with Healthcare Services** — Cultivate partnerships with medical facilities to ensure uninterrupted access to breast health services
- **Partnerships with Educational Institutions** — Establish alliances with academia
- **Training for Healthcare Workers** — Deploy training programs to empower healthcare professionals in rural setups

CONCLUSION

PinkDetect is a non-profit organization that raises breast health awareness through camps and educational sessions. It also has an app with interactive guides that use culturally appropriate content designed for the South Asian community.

Award Winner: ***Patient-Oriented and Epidemiology Projects***

78

From Theory to Practice: How Medical Students Engage with Sunscreen Usage

Kelsey Liu[1], Xiaoyao Qu[1], Dr. Leslie Goldstein[1]
[1]New York Institute of Technology College of Osteopathic Medicine

Biography: *Kelsey is a second-year medical student at the New York Institute of Technology College of Osteopathic Medicine (NYITCOM) and a 2023 Biology graduate from New York University (NYU). Her current research focuses on understanding barriers to sunscreen adherence among medical students to promote preventive health practices. She previously conducted research at the VA, gaining experience in survey design and data analysis. Kelsey is driven by a desire to serve the public as a future physician and is open to exploring different specialties as she advances in her medical training. Joyce is a second-year medical student at the New York Institute of Technology College of Osteopathic Medicine (NYITCOM) and a 2021 Neuroscience graduate from the University of Pittsburgh. Her current research focuses on understanding the barriers to sunscreen adherence among medical students, with the goal of providing insights to improve preventive health practices. Previously, she investigated insulin resistance and inflammatory pathways in obesity and Alzheimer's disease mouse models, gaining valuable experience in research proposal design and data analysis. Joyce envisions herself establishing long-term patient relationships, promoting preventive care education, and providing personalized care in her future medical practice.*

Abstract

Background: Medical students, as future advocates of preventative care, often overlook consistent sunscreen use, a simple yet effective measure to prevent skin cancer. Despite high awareness, adherence remains low, even among those educated about ultraviolet risk. Prior research has explored general knowledge, but few studies have examined barriers or motivators to sunscreen-adherence. We propose that personal and social factors, along with product characteristics, influence sunscreen-use behavior. Our study aims to identify these factors and provide physicians with recommendations to guide patients in sunscreen use, ultimately reducing skin cancer risk.

Methods: A cross-sectional survey was conducted among medical students across all four years and campuses at a selected medical institution. The survey gathered data on demographics, skin type, sunscreen-use consistency, and barriers/motivators to adherence. Adapted from Diehl et al. (2021), nineteen barrier questions were grouped into six categories: commitment, risk awareness, application, side effects, peer influence, and product characteristics. Six motivator questions assessed the impact of professional advice, social influence, and skin cancer awareness. Data were analyzed using Jamovi ver.2.5.7.

Results: The study sample (N=417) included 58.5% aged 18-25 years, 69.3% female, and 51.1% White. Predominant skin types were Type III (33.8%) and Type IV (28.5%), with lower sunscreen-use adherence observed among those with darker skin tones (Type V and VI). Chi-squared analysis revealed significant associations between sunscreen frequency and sex ($p<0.001$), skin type ($p=0.018$), and dermatologist visits ($p=0.009$).

Dermatology visits encouraged sunscreen use, with 30% of patients consistently using it versus 8% never using it. Key barriers ($p<0.01$) included lack of commitment (43.8%) and application difficulties (28.3%). Side effects like stickiness ($p=0.007$), eye irritation ($p=0.016$), and cosmetic concerns ($p<0.01$) further discouraged use. Conversely, social media ($p<0.01$) significantly encouraged adherence.

Conclusions: Despite their health knowledge, many medical students struggle with consistent sun protection. We recommend targeted strategies like addressing misconceptions about darker skin tones, expanding sunscreen options, and utilizing social media and dermatologist advice to encourage better adherence.

Inspiration: This project was inspired by the disconnect between medical knowledge and personal health practices. Preventative care is a cornerstone of reducing disease burden, and improving personal habits, like consistent sunscreen use, is a crucial first step. By identifying barriers, we aim to develop actionable strategies that empower healthcare workers to lead by example. Ultimately, our vision is to inspire more preventative care practices, enabling healthcare professionals to advocate more effectively for their patients' well-being and long-term health.

Poster Snapshot

NEW YORK INSTITUTE OF TECHNOLOGY
College of Osteopathic Medicine

From Theory to Practice: How Medical Students Engage with Sunscreen Usage

Kelsey Liu, OMS-II; Xiaoyao Qu, OMS-II; Leslie Goldstein, Pharm.D., FNAOME

BACKGROUND

- Skin cancer is one of the most commonly diagnosed cancers, with ultraviolet (UV) radiation exposure being a major preventable risk factor. In 2025, over 100,000 new cases of melanoma are expected to be diagnosed in the United States, emphasizing the importance of prevention.
- Sunscreen use is widely recognized as effective in reducing UV-related damage. However, even medical students training to be future advocates of preventative care overlook consistent sunscreen use. Despite high awareness, protective practice adherence remains suboptimal among this population educated about UV risk.
- Prior research has focused on general knowledge and awareness of sunscreen use, but few studies have investigated the personal barriers preventing consistent sunscreen use. By identifying key factors influencing sunscreen habits, we can develop targeted interventions.
- We propose that personal, social, and product-related factors collectively influence sunscreen adherence.
- Our study aims to identify these factors and provide recommendations to improve sunscreen use, ultimately reducing skin cancer risk and equipping future physicians to guide patients.

METHODS

- A cross-sectional anonymous survey was conducted via REDCap among New York Institute of Technology College of Osteopathic Medicine medical students (Classes of 2025–2028) at the Old Westbury, NY and Jonesboro, AR campuses.
- The survey gathered data on demographics, skin type, sunscreen use consistency, and perceived barriers and motivators to adherence. Questions were adapted a previously published item set [1].
- Students were recruited via email and GroupMe messages. Participation was voluntary, with implied consent via the survey link.
- Nineteen barrier questions were grouped into six themes: commitment, risk awareness, application, side effects, peer influence, and product characteristics. Six motivator items assessed professional advice, social influence, and skin cancer awareness.
- Data were cleaned, preprocessed, and statistically analyzed using Jamovi (ver.2.6.2) and Jupyter Notebook to explore the patterns and outcomes related to Chi-square tests and ordinary least squares (OLS) regression.

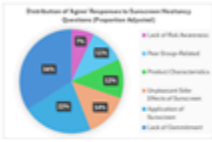
Demographics

		Count (%)
Age (years)	18-25	244 (58.5)
	26-35	156 (37.8)
	36-45	11 (2.6)
	>45	4 (1)
Race	Asian	162 (38.8)
	Black or African American	18 (4.3)
	Hispanic Non-White	8 (1.9)
	White	213 (51.1)
	Other	16 (3.8)
Sex	F	286 (69.3)
	M	126 (30.2)
	Other	2 (0.5)
Medical Campus	Jonesboro, Arkansas	126 (30)
	Old Westbury, Long Island	292 (70)
Medical Class	Class of 2025	59 (14.1)
	Class of 2026	59 (14.1)
	Class of 2027	130 (31.2)
	Class of 2028	169 (40.5)
Skin Type	I	17 (4.1)
	II	84 (20.1)
	III	141 (33.8)
	IV	139 (28.5)
	V	48 (11.5)
	VI	8 (1.9)

RESULTS

Chi-Square Analysis of Demographics and Sunscreen Usage

	Value	df	p
Sex	52.5	6	<.001
Skin Type	26.6	15	<0.05
Recent Dermatology Visit	11.7	3	<0.01
Race	20.5	12	0.056
Age	13.6	9	0.138
Medical School Year	5.07	9	0.828
Medical School Campus	0.5	3	0.915



Top Discouraging Factors (All Participants)

	Coefficient	P-value
...I do not need sunscreen	-0.743	<0.001
...I often forget to apply sunscreen	-0.465	<0.001
...I am too lazy to use sunscreen	-0.454	<0.001
...applying sunscreen takes too much time	-0.363	<0.001
...I get pimples when I use sunscreen	-0.187	0.034

Top Encouraging Factors (All Participants)

	Coefficient	P-value
...beauty standards (e.g. lightening/evening my skin, preventing benign sun spots)	0.372	<0.001
...social media	0.204	0.011
...advice from medical professionals	0.246	0.063

Top Discouraging Factors (Female)

	Coefficient	P-value
...I often forget to apply sunscreen	-0.690	**<0.001**
...applying sunscreen takes too much time	-0.499	**<0.001**
...I get pimples when I use sunscreen	-0.310	**0.001**
...I am too lazy to use sunscreen	-0.336	**0.002**
...I do not need sunscreen	-0.456	**0.015**

Top Discouraging Factors (Male)

	Coefficient	P-value
...I am too lazy to use sunscreen	-0.527	**0.005**
...I do not need sunscreen	-0.826	**<0.001**

DISCUSSION

- 97.12% of students recognized that sunscreen prevents skin cancer. However, only 21.8% reported daily use. This highlights a clear gap between medical knowledge and personal health practices.
- Barriers related to lack of commitment and inconvenience were most frequently selected, indicating that internal motivation and daily habits may be stronger deterrents than product accessibility or cost.
- Chi-square analysis showed significant differences in sunscreen use by sex and skin type, but not by medical school year or campus. Despite differences in climate—Jonesboro, AR typically receives more sun exposure than Old Westbury, NY—usage did not vary, suggesting that personal identity and perception may outweigh environmental factors in influencing behavior.
- Students who saw a dermatologist in the past year were more likely to use sunscreen consistently. This suggests that personal healthcare experiences may influence behavior more than education alone. Encouraging students to prioritize their skin health could serve as a behavioral model for future patient education.
- A heatmap showed that students with Fitzpatrick Skin Types IV-VI were less likely to use sunscreen consistently, reflecting a common misconception that darker skin is protected from UV damage. Addressing this belief is key to improving skin cancer prevention in populations of color.
- The top barriers to sunscreen use differed significantly between female and male students. Tailoring strategies to these sex-based differences may enhance the effectiveness of sunscreen adherence interventions.
- Students who believed that sunscreen improves appearance or is promoted on social media were more likely to use it. While not statistically significant, medical advice showed a positive trend ($p = 0.063$), suggesting a potential behavioral influence worth further exploration.

CONCLUSIONS

- Despite their health knowledge, many medical students struggle with consistent sun protection.
- The significant barriers identified (e.g., low motivation, perceived inconvenience, and misconceptions about UV risk in darker skin) highlight key areas for intervention.
- We recommend targeted strategies such as addressing misconceptions that darker skin is immune to sun damage, expanding sunscreen product accessibility and appeal, and leveraging social media and dermatologic advice to promote better sunscreen adherence among medical students.
- Encouraging personal engagement in skin health may also help future physicians better counsel patients and model preventative behaviors.

REFERENCES

1. Diehl K, Schneider S, Seufert S, Greinert R, Görig T. Who Are the Nonusers of Sunscreen, and What Are Their Reasons? Development of a New Item Set. J Cancer Educ. 2021;36(5):1045-1053. doi:10.1007/s13187-020-01732-2.
2. American Cancer Society. Facts & Figures 2025. Atlanta: American Cancer Society; 2025.
3. Mihalis EL, Wysong A, Buscaglia MJ, Tang R, Chren MM, Arron ST. Factors affecting sunscreen use and sun avoidance in a U.S. national sample of organ transplant recipients. Br J Dermatol. 2010;164(2):346-353. doi:10.1111/j.1365-2133.2010.10210.x
4. Rodríguez-Gambietta R, Moscoso-Porras M, Tejada-Rondan A. Factors associated with regular sunscreen use by medical students of a Peruvian university. J Prev Med Hyg. 2019;57(3):E172-E177.
5. Henrikson NB, Morrison CC, Blasi PR, Nguyen M, Evans CV, Patnode CD. Behavioral counseling for skin cancer prevention: a systematic evidence review for the U.S. Preventive Services Task Force. AHRQ Pub No. 2018;17-05230-EF-1. Agency for Healthcare Research and Quality. Published March 2018.

Award Winner: ***Reproductive Justice and Abortion-Related Projects (1)***

101

Narrative Justice in Action: Reducing Abortion Stigma in Medical Education Through Patient Storytelling in Case-Based Learning

Ms Sophie Schott[1], **Ms Chelsea Romero**[1], **Ms Julia O'Gara**[1], Ms Madison Schulz[1], Ms Likhita Nandigam[2], Ms Grace Drew[1], Ms Isha Parikh[1], Dr. Elizabeth Nugent[1]
[1]McGovern Medical School at the University of Texas Health Science Center Houston, [2]Baylor College of Medicine

Biography: *Sophie Schott is a first-year medical student at UTHealth Houston McGovern Medical School. Chelsea Romero is a 4th year MD/MPH student at UTHealth Houston McGovern Medical School who has recently been accepted into an OBGYN residency at Houston Methodist Hospital Willowbrook. Julia O'Gara is a fourth-year medical student at UTHealth Houston McGovern Medical School who has recently been accepted into a General Surgery residency at Baylor College of Medicine. Madison Schulz is a fourth-year medical student at UT Health Houston McGovern Medical School who has recently been accepted into an OBGYN residency at UTHouston. Likhita Nandigam is a third-year medical student at Baylor College of Medicine.Grace Drew is a second-year medical student and president of Medical Students for Choice at UT Health Houston McGovern Medical School.Isha Parikh is a second-year medical student at UT Health Houston McGovern Medical School.*

Abstract

Background: Abortion stigma creates significant educational barriers for medical trainees, especially for those in states with restricted abortion access. To address these concerns, virtual reproductive health modules that integrate patient stories with national APGO and MSFC Medical Educational Learning Objectives were developed for use throughout the pre-clerkship and clerkship curriculum. This interactive storytelling curriculum aims to reduce abortion stigma through exposure to patient stories, preparing students to safely care for patients in family planning, obstetrics, and gynecology. Each module targets identified gaps in medical students' reproductive health knowledge.

Methods: To identify gaps in medical student's reproductive health knowledge, a 25-item questionnaire was administered to medical students at three Houston-area medical schools. Descriptive and correlation statistics were used to examine the relationships between self-reported comfort level, previous training opportunities, and lived experiences related to pregnancy and reproductive health. Data collection for the first iteration of the survey will be complete by April 19, 2025, but data collection from the survey will be ongoing as it will be repeated serially for the next four years to assess changes in student knowledge and comfort levels with various reproductive health topics over time. Data collection on the impact of the virtual modules will be ongoing at the time of the presentation.

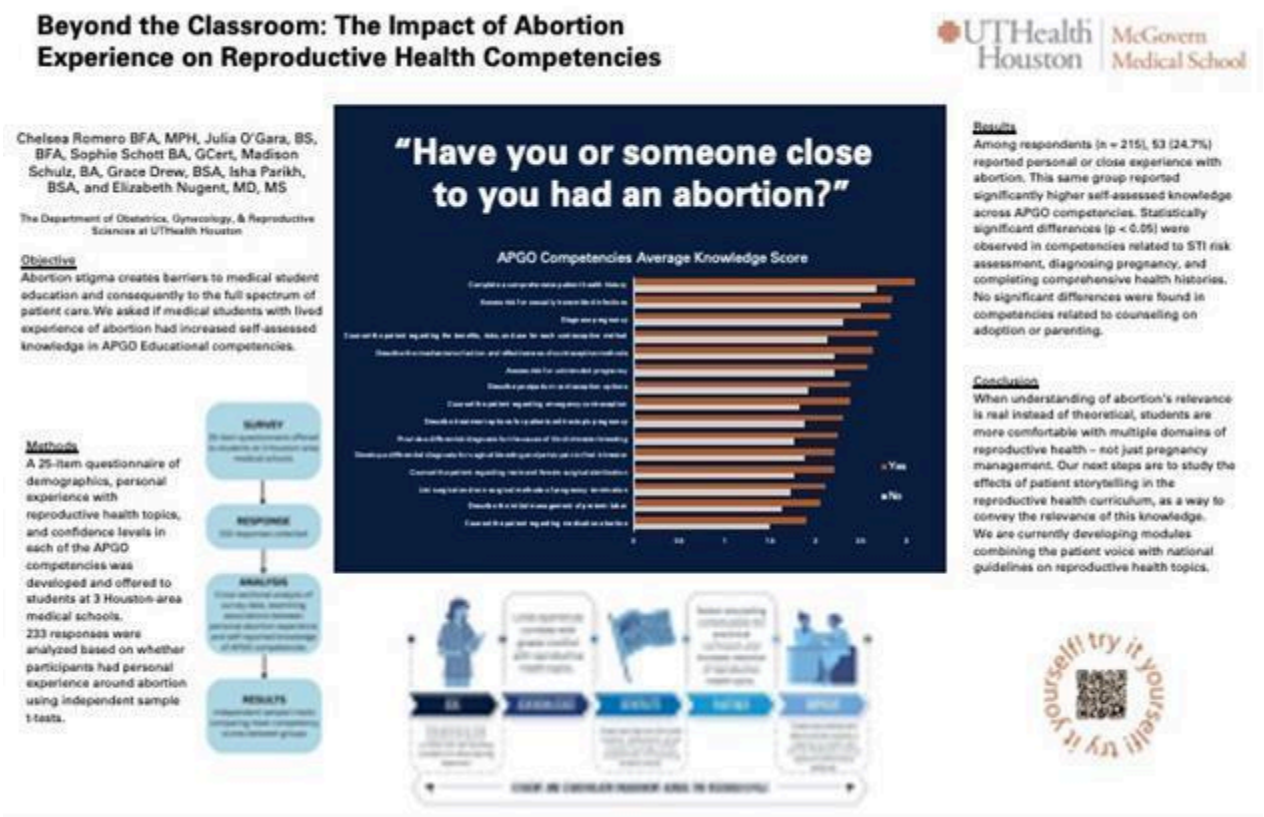
Results: Early results show a relationship between students' lived experiences and higher self-reported comfort levels with various reproductive health topics. Analysis of curricular impact is ongoing, with preliminary findings indicating that exposure to patient narratives in the virtual modules may reduce abortion stigma in medical education.

Conclusions: This project aims to reduce abortion stigma in medical education by integrating patient stories aligned with national OBGYN learning objectives for preclinical and clinical students. Each virtual module targets identified gaps in medical students' reproductive health knowledge and may be modified by educators to fit their unique institutional needs.

Inspiration: This interactive storytelling curriculum promotes health equity by empowering patients to shape and contribute to medical education by sharing their lived experiences through storytelling. The stories featured in the modules highlight the public health impact of the legal status of abortion as well as how socioeconomic and environmental factors impact access to reproductive health care.

Additionally, this curriculum aims to mitigate abortion stigma while expanding family planning education in states that restrict abortion, where racism, socioeconomic inequality, inequitable access to healthcare, and other forms of oppression harm medical learners and the communities that they care for.

Poster Snapshot



Award Winner: ***Reproductive Justice and Abortion-Related Projects (2)***

102

Pain in IUD Placement: Pre-, Intra-, and Post-Procedure Interventions to Improve the Patient Experience

Coleman Schaefer[1], **Isabela Bello-Zap**, Benjamin Ihms[1]
[1]A.T. Still University School of Osteopathic Medicine in Arizona

Biography: *Coleman Schaefer is a third year medical student at A.T. Still University School of Osteopathic Medicine Arizona currently at their New Jersey community partner site. Prior to starting medical school he completed his MPH at the University of Southern California, focusing on creating equitable pain management policy reform, and Georgetown University's Special Masters Program. He plans on using his background to create holistic, impactful changes while pursuing a career in pain management. Isabela Bello-Zap is a third year medical student at A.T. Still University School of Osteopathic Medicine in Arizona currently at their Scranton, Pennsylvania community partner site. Prior to medical school, she completed her undergraduate degree in Public Health at Rutgers University with the goal of addressing health disparities, destigmatizing mental health in marginalized communities, and promoting harm reduction related to on-campus alcohol and drug use. She plans to apply these experiences to the women's health atmosphere, providing comprehensive and creative solutions to optimize care as she pursues a career in obstetrics and gynecology.*

Abstract

Introduction: To address patient pain and improve subjective outcomes of intrauterine device insertion, patient centered reforms require integration of pharmacologic, methodological, and socially-aware changes throughout all stages of care.

Methods: A narrative review of Medline Complete was conducted using keywords intrauterine device, IUD insertion, pain management, and analgesics. Results were filtered out by articles prior to 2019, duplicates, and retracted articles. The search produced 27 articles.

Results: Three major categories were identified following literature review: pre-procedure ("what is my care going to look like"), intra-procedure ("what is the physician doing"), and post-procedure ("what are my outcomes going to be"). Pre-procedure changes included comprehensive evaluation for anxiety, self administration of vaginal dinoprostone, acupuncture, and anti-inflammatory agents. Intra-procedure changes included paracervical blocks, alternative instruments, distraction methods, and local analgesia. Post-procedure changes used ultrasound guidance for reassurance. Pain ratings were highest during sounding, tenaculum placement, insertion of the device, and adolescent and nulliparous women.

Implications: A relationship between pre-procedure anticipated discomfort was associated with intra-procedure pain in some articles, highlighting the potential role of anxiety as a contributing factor to perceived pain. Pharmacologic management is effective in reducing pain scores intra- and post-procedurally, while maintaining procedure length. Alternative tools are equally efficacious without causing trauma and distraction methods effectively attenuated anxiety. Ultrasound guided insertion confirms proper placement, allowing women confidence. Pain assessment varied between scales and timing of evaluation, limiting direct comparisons of articles. Methods discussed have broader application to optimize patient satisfaction through improved pain control in other gynecologic procedures. Specific research on multifaceted procedural revision is needed to evaluate additive effects of procedure modifications in improving patient experience.

Inspiration: We were inspired to write this paper based on our individual experiences during our OB GYN rotations professionally. This was a way for us to work together on a project merging our unique passions for pain management and women's reproductive health and create something to better the scientific community. This first paper in the series is meant to be an outline of the procedure modifications being researched for IUD placement. Subsequent papers will focus on the comparison of different methods within the categories outlined in this paper. Our goal is to ultimately create an improved protocol for IUD placement which better addresses patient pain and anxiety throughout the entirety of the procedure. A secondary goal is to inspire other researchers to explore the effectiveness of a multifaceted revision to IUD placement.

Poster Snapshot

ATSU
A.T. Still University

Pain in IUD Placement: Pre-, Intra-, and Post-Procedure Interventions to Improve the Patient Experience

Coleman Schaefer MPH, Isabela Bello-Zap, Benjamin Ihms DO
AT Still University School of Osteopathic Medicine Arizona

ATSU
School of Osteopathic Medicine in Arizona

Background

- Intrauterine devices (IUDs) are the third most commonly used method of contraception in the United States.
- Current guidelines on addressing pain during IUD insertions are vague, leaving the possibility of inadequately treated pain during the procedure.
- Integrating pharmacological, methodological, and socially-aware changes are required in approaching patient centered reforms that address pain and anxiety during IUD insertion.

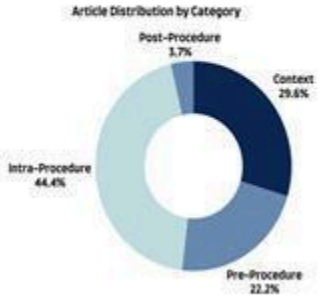
Objectives

- Identify areas within the IUD insertion that produce the most pain for women.
- Create a comprehensive list of interventions actively being researched.
- Propose a multifaceted procedural revision to IUD insertion to reduce pain and improve the patient experience.

Methods

- A narrative review of EBSCOhost Medline Complete was conducted.
- Keywords used included intrauterine device, IUD insertion, analgesics, and pain management.
- Twenty seven articles met inclusion criteria after being screened for duplicates and retractions.

Preliminary Findings/Results



Discussion

- Pre-procedural interventions reduced feelings of anxiety, intra-procedural pain, and gave women autonomy through self administration.
- Anxiety may contribute to pain perception prior to the procedure.
- Pharmacologic pain management significantly reduced intra- and post-procedural pain without increasing procedure length.
- Alternative tools and distraction methods were effective.
- Use of ultrasound intra-procedure provided women with confirmed placement, reducing anxiety.

Conclusions

- There are many opportunities to create positive refinement of pain control during the IUD insertion procedure.
- Combining multiple of these interventions could result in significant improvement in the patient experience.
- Methods discussed have broader applications for other gynecologic procedures.
- Further research on the additive effects of interventions is needed to determine which combination is more effective.

References

Attached as additional appendix. Please scan QR code to access.

Award Winner: ***Reproductive Justice and Abortion-Related Projects (3), Pre-Medical Student***

96

Every Pregnancy Deserves Precision Care: Cover CGMs for Pregnant Women with Gestational Diabetes

Cerena Clark[1]
[1]University of Central Arkansas

Biography: *Cerena is a recent graduate from the University of Central Arkansas. She is an incoming Master's in Biomedical Sciences student at NYIT-College of Medicine.She is currently enrolled in the AMSA Advocacy Scholars program.She hopes to use her platform to advocate for better women's healthcare in Arkansas at the policy level.*

Abstract

Background: Arkansas continuously ranks near the bottom of all states in women's health. Every year that women's healthcare is ignored, the NICU rates increase. Healthcare leaders in Arkansas have expressed their concern for the staggering NICU admittance rates amongst diabetic mothers especially.

Methods: I began this process by researching current healthcare policies in place related to the care of a gestational diabetic mother. I found out that there is no coverage of a continuous glucose monitor for women with Gestational Diabetes. At the time, I started this project, there were no bills or laws in place related to this subject. In December 2024, an Arkansas lawmaker proposed a bill to require Medicaid to cover CGM's for women with Gestational Diabetes. In January 2025, I reached out to him and he agreed to a meeting.

Results: Early findings show 28.9% of women in Arkansas that have a preterm birth also had diabetes. There are currently no insurance coverage options for women with gestational diabetes to wear a continuous glucose monitor, despite research showing this is the best form of preventive care. A meeting with a lawmaker is set for a TBD date. This advocacy work is still in place and the results are not clear if they will be complete by April 19,2025.

Conclusion: Insurance coverage is currently not available for pregnant women with gestational diabetes to obtain a continuous glucose monitor. Preventive care is essential to prevent preterm birth.

Inspiration: Women's healthcare has a wide variety of problems that need to be addressed to obtain better outcomes. The 2024 March of Dimes report rates Arkansas a preterm birth grade F. Many common denominators and chronic health conditions that lead to a preterm birth are known, yet without insurance's approval, nothing will be changed. To foster a future of healthcare innovation, the problem must be addressed at all ends which includes but is not limited to, creating laws that force insurance companies to cover the best standard of care.

Poster Snapshot

Every Pregnancy Deserves Precision Care: Cover CGMs for Pregnant Women with Gestational Diabetes

Cerena Clark

Introduction:

Gestational diabetes affects up to 10% of pregnancies, putting both mothers and babies at risk of serious health complications. However, many insurance plans fail to cover continuous glucose monitors (CGM's) for women with Gestational diabetes, despite evidence showing these devices can reduce complications and save healthcare costs.

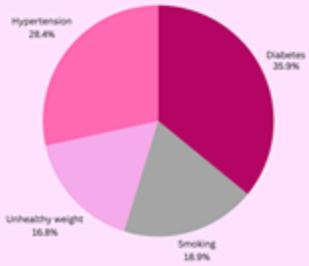
Advocacy Goal:

Expand insurance coverage to include continuous glucose monitors (CGMs) for ALL pregnant people with gestational diabetes, regardless of whether they pass or fail glucose tolerance tests. CGMs are crucial for better blood sugar management and can reduce the risk of complications like NICU admissions, preterm labor, and long-term diabetes.

Methods:

1. Research local insurance policies and coverage gaps related to CGMs for women with Gestational Diabetes.
2. Reach out to lawmakers
3. Reach out to Arkansas Maternal Perinatal Quality Committee.
4. Follow up with lawmakers and reach out to local media

Causes of Preterm Birth in Arkansas



Source: March of Dimes 2024 Report Card

Results:

I was able to get a reply from only one lawmaker Rep. Pilkington. He welcomed my insights and invited me to meet in person. Once the committee hearings started in January I no longer got a response. I continued reaching out to media outlets to write an op-ed. In February 2025, HB 1061 merged into the Healthy Moms Healthy Babies Act and CGMs for gestational diabetes now has to be covered by pregnancy medicaid.

Arkansas Democrat Gazette

Local News | Legislative Session | Opinion | Puzzles | Obituaries | New

Bill to boost maternal health passes

Senate panel backs House legislation aimed at Medicaid

February 18, 2025 by Josh Snyder

Next Steps:

Next steps should focus on making this a law for all insurance companies to cover CGMs for pregnant people. Additionally, this law should be brought forward to federal legislation to become a law nationwide. In the meantime, I urge you to start the conversation on getting this law passed in your state.

Urge it to be Nationwide law!

ABSTRACTS

ADVOCACY,
GRASSROOTS,
AND
POLICY PROJECTS

1

A Federal Health Insurance Agency's Roadmap for Health Equity: A Survey of Healthcare Leaders on Organizational Preparedness

Keerit Mander[1]
[1]Glenwood High School, [2]SIU School of Medicine-McNeese Physician Preparatory Pathway Program, [3]Motherland Community Project

Biography: *Keerit Mander is a Junior at Glenwood High School, who loves all things STEM and believes in making a difference in whatever she does. She intends to pursue biology and health policy as an undergraduate. Witnessing disparities in healthcare access, she is motivated to better understand social determinants of health outcomes and the value of preventative medicine. Keerit is Head of Service of her Student Council and Lieutenant Governor of Division 28 of Illinois-Eastern Iowa District, Key Club. She is an intern at Motherland Garden Community Project, a non-profit organization that transforms vacant lots into urban farms in underserved neighborhoods to address food insecurity and promote community resilience. Keerit serves as their Volunteer and Community Outreach Coordinator, and has mobilized her high school student council to help further their mission for greater impact. She is a participant of the McNeese Physician Preparatory Pathway Program at Southern Illinois University School of Medicine, a four year after-school program that focuses on problem based learning, laboratory aptitude development, research, special lectures, skill training, and job shadowing. She spends her summers as a Junior Samaritan at HSHS St. John's Hospital, providing housekeeping assistance to patients and their families. Keerit also loves to play tennis and is a varsity player on her high school team.*

Abstract

Background: Federal health and insurance agencies have identified the achievement of health equity as a factor that will drive the action on the nation's leading health priorities and have developed a framework with five priorities focusing on data collection, disparity assessment, healthcare capacity building, cultural competency, and accessibility enhancement. The objective of this study was to evaluate the progress of healthcare organizations in an urban county in implementing the five priorities outlined by the framework and identify barriers to their fulfillment.

Methods: A survey was conducted of 30 healthcare leaders in an urban county that serves as a medical hub with two tertiary care hospitals and a medical school. Respondents rated their organizational preparedness for each priority on a five-point scale (1=poor to 5=excellent) and ranked potential implementation barriers.

Results: Mean preparedness scores for the five priorities were: Priority 1 (Data Collection) 3.37±0.928, Priority 2 (Disparity Assessment) 2.47±0.937, Priority 3 (Capacity Building) 2.40±0.894, Priority 4 (Cultural Competency) 2.90±0.995, and Priority 5 (Accessibility) 2.83±0.950. One-sample t-tests comparing these means to the scale midpoint of 3 (adequate) revealed that Priority 1 was significantly above adequate ($p = .039$, Cohen's $d = 0.40$, 95% CIdiff: [0.02, 0.71]), while Priority 2 ($p = .004$, Cohen's $d = -0.57$, 95% CIdiff: [-0.88, -0.18]) and Priority 3 ($p < .001$, Cohen's $d = -0.67$, 95% CIdiff: [-0.93, -0.27]) were significantly below adequate. Priority 4 ($p = .586$, Cohen's $d = -0.10$, 95% CIdiff: [-0.47, 0.27]). "Funding and resources" was most frequently ranked as the highest barrier (53.3%).

Conclusion: Healthcare leaders in the county rated their organizational readiness at or near merely adequate across all five framework priorities, falling short of what's needed for meaningful health equity. Barriers, especially in funding and resources, indicate significant challenges in implementing the framework. This study's findings can guide healthcare organizations in prioritizing health equity.

Inspiration: Health equity means everyone has a fair chance to achieve their highest level of health, and is influenced by Social Determinants of Health (SDH)—the conditions in which people are born, grow, work, and age. SDH has shown to account for 30-55% of health outcomes. As a community volunteer, experiencing firsthand how socio-economic disparities impact individuals' quality of life and health outcomes, I was curious to know what local health organizations were doing to combat these disparities. By prioritizing disparity reduction, health organizations can advance health equity and decrease preventable negative health outcomes in their communities.

Advocacy, Grassroots, and Policy Projects

2

A Survey of the Role of Compensation in Medical Student Specialty Choice

Allison Platt[1], Dr. Sabah Servaes
[1]Amherst College

Biography: *Allison Platt is a junior Neuroscience major at Amherst College. She is on the pre-med track and currently works as an EMT. She has been working with Dr. Sabah Servaes at West Virginia University for the past year on a project about medical students' specialty choices.*

Abstract

Background: The number of medical school graduates entering pediatrics in the United States has gradually declined, resulting in critical shortages in many pediatric subspecialties. We hypothesize that a reason for this shortage is a difference in compensation, as current reimbursement systems result in lower compensation for pediatric specialties and subspecialties.

Methods: We sent an anonymous online survey to medical students to assess the role of salary in specialty choice. We asked students for the maximum pay cut they would be willing to accept for a “specialty that was fulfilling and worked with [their] ideal patient population” under two conditions: equal work and a higher call burden. We also assessed potential external factors that influence career choice, such as student loans and interest in private practice vs. academic medicine. The distributions were analyzed and compared using a Chi-square test.

Results: Overall, 22.90% of medical students (n=35) would not be willing to accept less compensation for a specialty that also has a higher call burden, as pediatrics often does. Using the benchmark of a 25% salary reduction for pediatric medicine compared to adult practice, we found that 68.6% of our sample would not accept a comparable pay cut for a specialty with an equal call burden, and 91.5% would not accept this pay reduction for a specialty with a higher call burden. To help preserve anonymity, we decided not to associate data with demographic information.

Conclusion: Our results indicate that lower compensation is likely an influential deterrent from pediatrics for current medical students. Despite being early on in their career, we found that roughly a quarter of medical students sampled would not be willing to accept lower compensation for comparable work, a percentage that was higher for specialties with higher call burdens.

Inspiration: Overall, equal pay for equal work should be the goal, and systemic change should be considered to address these discrepancies in salary. We propose that higher compensation would address current physician shortages in pediatric specialties. Since pay cuts can act as a strong deterrent from these specialties, higher pay overall would likely boost interest among medical students. Greater representation in the RVU decision process is also crucial, as the current system doesn’t account for the special skills needed to get results for the pediatric population. Thus, policy change on this matter is crucial in ensuring that children receive the highest quality care.

Advocacy, Grassroots, and Policy Projects

Poster Snapshot

A Survey of the Role of Compensation in Medical Student Specialty Choice

Allison S. Platt,[1] Sabah Servaes, MD[2]
[1] Amherst College, Department of Neuroscience
[2] West Virginia University, Department of Pediatric Radiology

INTRODUCTION

- The number of medical school graduates entering pediatrics and pediatric subspecialties in the United States has gradually declined, resulting in critical shortages.[1]
- Lifetime earning potential is 25% more ($1.2 million higher) for physicians providing care to adults compared to those caring for the pediatric population.[2]
- Pediatrics has a higher call burden than adult primary care, anesthesia, cardiology, OB/GYN, psychiatry, and urology.[3]

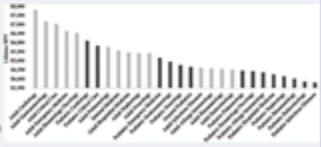


Fig 1: Lifetime net present value (NPV) Pediatric vs. Adult[2]

EXPERIMENTAL QUESTION

- What role does compensation play in medical students' specialty choice, and is it possible that lower compensation is a deterrent from pediatrics, thus contributing to the shortage?

HYPOTHESIS/PREDICTION

- Lower compensation likely acts as a deterrent from the field of pediatrics for medical students.

METHODS

- We sent an anonymous online survey to current medical students.
- We asked the maximum pay cut they would be willing to accept for a "specialty that was fulfilling and worked with [their] ideal patient population" under two conditions:
  1. Equal call burden
  2. Higher call burden
- We also assessed potentially influential external factors:
  - Student loans
  - Interest in private practice vs. academic medicine
- We assessed demographic information but, to preserve anonymity, did not associate it with data.

RESULTS

- Using the benchmark of a 25% salary reduction for pediatric medicine compared to adult practice
  - 68.6% of would not accept for a specialty with an equal call burden
  - 91.5% would not accept for a specialty with a higher call burden
- Roughly a quarter of medical students sampled would not be willing to accept lower compensation for comparable work.

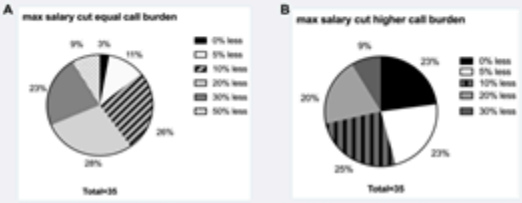


Fig 2: Proportion of sample willing to accept each level of pay cut for a subspecialty with equal call (A) and higher call (B).

CONCLUSIONS

- Compensation is likely an influential deterrent for current medical students from pediatrics.
- Equal pay for equal work should be the goal, and systemic change should be considered to address these discrepancies in salary.
- Greater representation in the Relative Value Unit (RVU) decision process is also crucial, as the current system doesn't account for the special skills needed to get results for the pediatric population.
- Policy change on this matter is crucial in ensuring that children receive the highest quality care.

REFERENCES

1. Vinci RJ. The Pediatric Workforce: Recent Data Trends, Questions, and Challenges for the Future. *Pediatrics*. 2021;147(6):e2020013292. doi:10.1542/peds.2020-013292
2. Catenaccio E, Rochlin JM, Simon HK. Differences in Lifetime Earning Potential Between Pediatric and Adult Physicians. *Pediatrics*. 2021;148(2):e2021051194. doi:10.1542/peds.2021-051194
3. Buckhead FMV. 2019 https://www.aao.org/Assets/e121a303-5014-47d6-bbf0-8c3255d3f91c/637091860317630000/bfmv-physician-call-coverage-burden-and-compensation-survey-2019-pdf?inline=1

3

Empowering Future Physicians: Financial Planning Services for Minnesota's First-Generation Medical Students

Isaiah Nolan[1], **Aarohi Shah**[1], Dr. Ana Núñez
[1]University of Minnesota Medical School

Biography: *Aarohi Shah (she/her) is a second-year medical student at the University of Minnesota Twin-Cities. A native Minnesotan, she has an interest in advocating for underrepresented medical students and their communities. Aarohi is excited by the opportunity to connect with students from other institutions, learn from their experiences, and collaborate on strategies to advocate for more inclusive and equitable healthcare.*

Abstract

Background: Financial literacy and planning are essential to achieve financial security, yet many first-generation medical students face significant barriers due to a lack of generational wealth, substantial student loan debt, and systemic inequities. In Minnesota, where education inequity is vast, first-generation students bear a disproportionate burden. Studies have found that financial literacy is more important than schooling for explaining variations in household wealth and pension contributions and that improved financial literacy can have large wealth payoffs. The Financial Planning Association of Minnesota and the University of Minnesota Medical School have partnered to address these disparities through the Financial Planning for First-Generation Students (FP4FG) program.

Methods: The FP4FG program offers first-generation medical students annual access to free financial planning services provided by certified financial planners (CFPs) volunteering on a pro-bono basis. These services include personalized strategies for managing student loan debt, budgeting, saving, and investment planning. The program also organizes "Finance Days" during the first and final years of medical school to provide seminars on financial literacy and opportunities for one-on-one consultations with financial planners. To measure the program's impact, participants complete surveys before and after their involvement, capturing changes in financial confidence, literacy, and stress.

Results: Preliminary data anticipates increased financial preparedness for attending-physician life, improved academic performance, and reduced stress due to enhanced financial education. Analysis of pre-surveys is underway, with a follow-up post-survey planned for January 2026 to evaluate the program's impact on financial education and well-being.

Conclusion: Many Minnesota resident-physicians struggle to meet their basic needs in residency. With financial literacy on the decline, wealth inequality, and large amounts of debt, there is a great need to provide financial literacy education and free financial services to first-generation medical students. This initiative not only fosters individual financial security but also contributes to addressing broader systemic inequities in healthcare access and provider diversity.

Inspiration: A quote by Dr. Alexandra Killewald highlights our inspiration for this program: *"Wealth is distinctive because it can be used as a cushion and can be directly passed down across generations, providing greater opportunity in the present and the future*." The FP4FG program represents a step toward ensuring that future physicians from underrepresented backgrounds are not only able to meet their immediate financial needs but are also positioned to build a secure future to uplift themselves and their communities. I am excited about this future!

Advocacy, Grassroots, and Policy Projects

Poster Snapshot

AMSA ACADEMY SCHOLARS PROGRAMS AND INSTITUES PARTICIPANT PROJECTS

5

Assessing the Impact of the Installation of Aunt Flow Free Menstrual Product Dispensers on Northeast Ohio Medical University's (NEOMED) Campus

Elsa Khan[1]
[1]Northeast Ohio Medical University

Biography: *Elsa Khan is a current second year medical student at Northeast Ohio Medical University (NEOMED). Some of her passions include advocacy work for marginalized communities, health literacy, and making healthcare more accessible and equitable for all. Some of her hobbies include any form of crafting, whether that be sewing, painting, crocheting as well as cooking or baking and sharing her creations with others. Elsa is an aspiring Psychiatrist and has been dreaming to work with Doctors Without Borders since she first found out about the organization.*

Abstract

Background: The purpose of this project is to determine how the installation of Aunt Flow machines have impacted NEOMED's campus and their students. Assessing the impact of these dispensers will help highlight the importance of increasing accessibility to every-day products and how it could contribute to a more welcoming campus environment. It will also help determine the usage rate of these dispensers around campus.

Methods: A survey sent out to the NEOMED campus asked those who have used the Aunt Flow dispensers to fill it out. The survey being used primarily is on a Likert Scale gauging how much a student agrees with a set of questions related to Aunt Flow and its impact in their lives. I am determining the average score per question and analyzing the trends seen based off of the responses. The responses will measure how satisfied students are with the Aunt Flow dispensers and its overall impact on campus. It will also determine if the dispensers improved the perception of NEOMED as a campus.

A secondary survey will be sent out to Campus Operations staff to determine how many refill orders have been sent to determine how often they are used.

Results: Although the project is still gathering data, what I have seen and heard so far have been overwhelmingly positive. The general theme is that many students have mentioned that having access to menstrual products is important to them and that they are thankful that NEOMED has several dispensers throughout campus. I will be done gathering data by early April, results will be finalized then.

Conclusions: To reiterate above, the project is still underway.

Inspiration: As a class representative on the Student Council at NEOMED, I pitched the idea of installing these free menstrual product dispensers. Accessibility and equity will always be topics I advocate on behalf of. The inspiration behind the assessment was from overhearing peers happily talk about how much they appreciated having the dispensers on campus.

I wanted to collect data regarding the impact of these dispensers not only in the students' lives but also to see if it changed their perception of NEOMED while exploring if the installation of Aunt Flow machines made them feel more considered on campus. The preliminary results highlight the importance of accessibility, and how meeting a basic need can drastically improve the well-being of a campus.

7

Redefining Reproductive Healthcare Stigmas: Using Empathy as a Clinical Tool

Alesandra Sheffler[1]
[1]Lake Erie College of Osteopathic Medicine, Seton Hill Campus

Biography: *Alesandra Sheffler is a second-year medical student at the Lake Erie College of Osteopathic Medicine – Seton Hill Campus. She earned her undergraduate degree from Seton Hill University, where she majored in biology and minored in psychology. Passionate about reproductive health, she is dedicated to promoting equity, advocacy, and patient-centered care. Alesandra looks forward to beginning her clinical rotations in June, where she hopes to further develop her skills in compassionate and inclusive healthcare. She aspires to become an OB-GYN who fosters a supportive environment for all patients, ensuring they feel heard, respected, and empowered in their reproductive health journeys.*

Abstract

Stigma within reproductive healthcare remains a significant barrier to equitable, patient-centered care. Rooted in historical biases and systemic discrimination, stigma disproportionately impacts marginalized communities, including racial and ethnic minorities, LGBTQ+ individuals, and those seeking contraceptive or abortion services. These biases contribute to negative patient experiences, increased healthcare disparities, and reluctance to seek necessary care.

This presentation explores the role of empathy as a transformative tool in reducing stigma and fostering trust in reproductive healthcare. Empathy-driven care enhances patient-provider communication, improves adherence to treatment plans, and mitigates the effects of implicit bias. Integrating empathy-focused training by including role-playing exercises, cultural competency education, and stigma-reduction modules into medical curricula can prepare future physicians to deliver more inclusive, compassionate care.

By prioritizing empathy in clinical interactions, healthcare providers can dismantle harmful stereotypes and create a more supportive, equitable environment for all patients. This call to action urges medical students and educators to embrace empathy-based education as a crucial step toward reshaping reproductive healthcare for the better.

Poster Snapshot

Redefining Reproductive Healthcare Stigmas: Using Empathy as a Clinical Tool

Alesandra L. Sheffler, OMS-II
Lake Erie College of Osteopathic Medicine at Seton Hill, American Medical Student Association
1 Seton Hill Drive, Greensburg, PA, 15601

What and Where is Stigma in Reproductive Healthcare?

Historical Origins of Stigma in Reproductive Healthcare

- Stigma is defined as "**labeling, stereotyping, separation, status loss, and discrimination**" in a situation where power is exercised.[1]
- Stigma and discrimination are highly pervasive in **sexual and reproductive healthcare settings**. This adversely affects patient experiences, outcomes, and the physician-patient relationship.[2]
- Historically, reproductive healthcare has been a **male-dominated field**, often marginalizing women's needs. This is based in societal views on women's roles, sexuality, and morality.[2]
- **Systemic racism** has long shaped reproductive healthcare, with **Black and Hispanic individuals** historically experiencing higher rates of adverse outcomes in comparison to White individuals.[3]

Stigma in Contraceptive and Abortion Care

- **Contraceptive care and abortion** are often framed as **immoral and taboo**, contributing to the permeating stigma.[4]
- **Implicit bias** from the lens of the provider can lead to miscommunication, underestimation of concerns, and unequal treatment for patients.[3] For many women, the **fear and anticipation of being judged** by their healthcare provider causes mental distress, fear, and depression. These assumed implicit biases can contribute to **delays in care-seeking** among patients.[4]
- Issues specifically targeting **contraception and abortion** are stigmatized based on the societal standards of gender roles and familial structure. This ultimately perpetuates a cycle of marginalization in healthcare, where particularly women of color and unmarried women, experience the most stigmatization.[3,4]

Stigma and Disparities in Maternal Healthcare

- **Racial and ethnic minorities** – particularly **Black and indigenous women** – experience disproportionately higher rate of maternal morbidity and mortality in the United States.[3] These groups often have a more limited access to quality healthcare, further exacerbating these issues.[4]
- **Black women are three to four times more likely to die** from a pregnancy-related cause in comparison to white women, even with educational and income levels being controlled.[3]

Stigma Against LGBTQ+ Patients

- **LGBTQ+ and non-binary individuals** routinely face stigma often stemming from hetero- and cis-normative assumptions.[1]
- Traditional healthcare models are not inclusive and exclude education for diverse sexual and gender identities, contributing to discrimination and reluctance to treat certain patient populations.[1]
- **Fear of discrimination** causes avoidance of medical care, including **STI testing, fertility testing, or gynecological counseling**.[5]
- Transgender men and nonbinary individuals seeking reproductive care often report **alienation or psychological harm** due to lack of provider training.[7]
- Studies show LGBTQ+ patients that have empathetic and affirmative providers are significantly more likely to **engage in regular and preventative reproductive healthcare**.[6,7]

Why is Empathy Important?

Empathy as a Tool for Reducing Stigma in Patient Care

- In a clinical setting, empathy is defined as "the **ability to understand the patient's situation, perspective, and feelings**, communicate that understanding to them, and act on it in a helpful and therapeutic way."[8]
- Empathy creates a more **inclusive, supportive, and respectful** healthcare environment.[3] Empathetic providers are more likely to have patient trust and comfort, allowing patients to **disclose sensitive information**, especially in a reproductive health context.[9]
- Empathetic interactions directly **challenge harmful stereotypes and implicit biases**, promoting a more compassionate and equitable approach to healthcare.[9]

Figure 1. Common Themes in Utilized in Empathy Training. Using a variety of formats and themes in empathy training can help foster growth and understanding from a clinician's perspective.[9]

Empathy and Improved Patient Trust

- **Trust** is the foundation of high-quality healthcare. When patients feel acknowledged and respected they are most likely to develop trust in their healthcare providers.[3,4]
- This trust is essential in reproductive healthcare, due to **shame, fear, and stigma** that complicate disclosure and treatment-seeking.[4]
- Empathetic communication, including **culturally aware interactions** and **inclusive language**, has been shown to increase trust among historically marginalized populations.[3,4]

How Empathy Can Enhance Adherence to Care Plans

- Empathy in clinical interactions is strongly associated with **improved patient outcomes** and **patient adherence to treatment plans**.[3]
- In reproductive healthcare, where patients fear stigma due to contraceptive use, abortion, infertility, or identity, empathetic care can help overcome reluctance toward seeking treatment.[4]
- This model is critical in marginalized communities, in which past negative experiences often impact **ongoing care** engagement.[3,4]

How Can Empathy be Implemented in Medical School Training?

Empathy Training Through Clinical Role-Playing and Simulations

- Embedding **stigma-reduction** and **empathetic communication** modules in medical school curricula can prepare future physicians to deliver competent and compassionate reproductive healthcare.[7]
- Structured simulations and **role-playing exercises** give students the opportunity to step into multiple perspectives (patient, provider, support person) and practice communication for emotionally sensitive topics like abortion, contraception, and maternal care.[3]

Incorporating Inclusivity and Cultural Competence in Medical Curricula

- **Simulation-based empathy training** allows students to build confidence and communication skills in a supportive, low-risk environment.[3]
- This curricula allows students to **gain cultural humility** and explore how factors like **race, gender identity, sexual identity, or class** may affect a patient's healthcare experience.[4]
- Incorporating **inclusive language**, addressing implicit biases, and emphasizing **equitable care** for all patients, regardless of background, are vital components to medical education.[3,4]
- **Cultural competency training** can reduce provider discomfort and enhance trust and satisfaction among marginalized patient communities.[4]

Medical Student Call to Action

- Empathy training in reproductive healthcare education is a **crucial strategy to dismantle stigma**, **improve patient outcomes**, and **strengthen physician-patient relationships**.
- Future physicians have the power to **transform the reproductive healthcare space** by advocating for inclusive and patient-centered training modules in their education.
- By embracing empathy, students and future providers can shift healthcare toward an **environment that is more equitable, empowering, and most of all - human**.
- **The time for change is now** – and medical education is just the right place to start.

References

Kaur GS S, Banks PA, Mukherjee D, Dsouza R. Strategies to reduce stigma and discrimination in sexual and reproductive healthcare settings: A systematic review. PLOS Glob Public Health. 2023;3(8):e0000562. doi:10.1371/journal.pgph.0000562

Bulman MA, Vazquez Corona M, Ortega DJ, et al. Strategies to reduce stigma and discrimination in sexual and reproductive healthcare settings: A mixed-[illegible] systematic review. PLOS Glob Public Health. 2023;3(8):e0000562. doi:10.1371/journal.pgph.0000562

Sutton MY, Anachebe NF, Lee R, Skanes H. Racial and Ethnic Disparities in Reproductive Health Services and Outcomes, 2005-[illegible]. Obstet Gynecol Clin North Am. 2021;48(3). doi:10.1016/j.ogc.2021.04.003

Mohammed F, Kohan S, Mostafavi F, Ghodsi A. The Stigma of Reproductive Health Services Utilization by Unmarried Women. Iran Red Crescent Med J. 2017;19(4):e42431. doi:10.5812/ircmj.42431

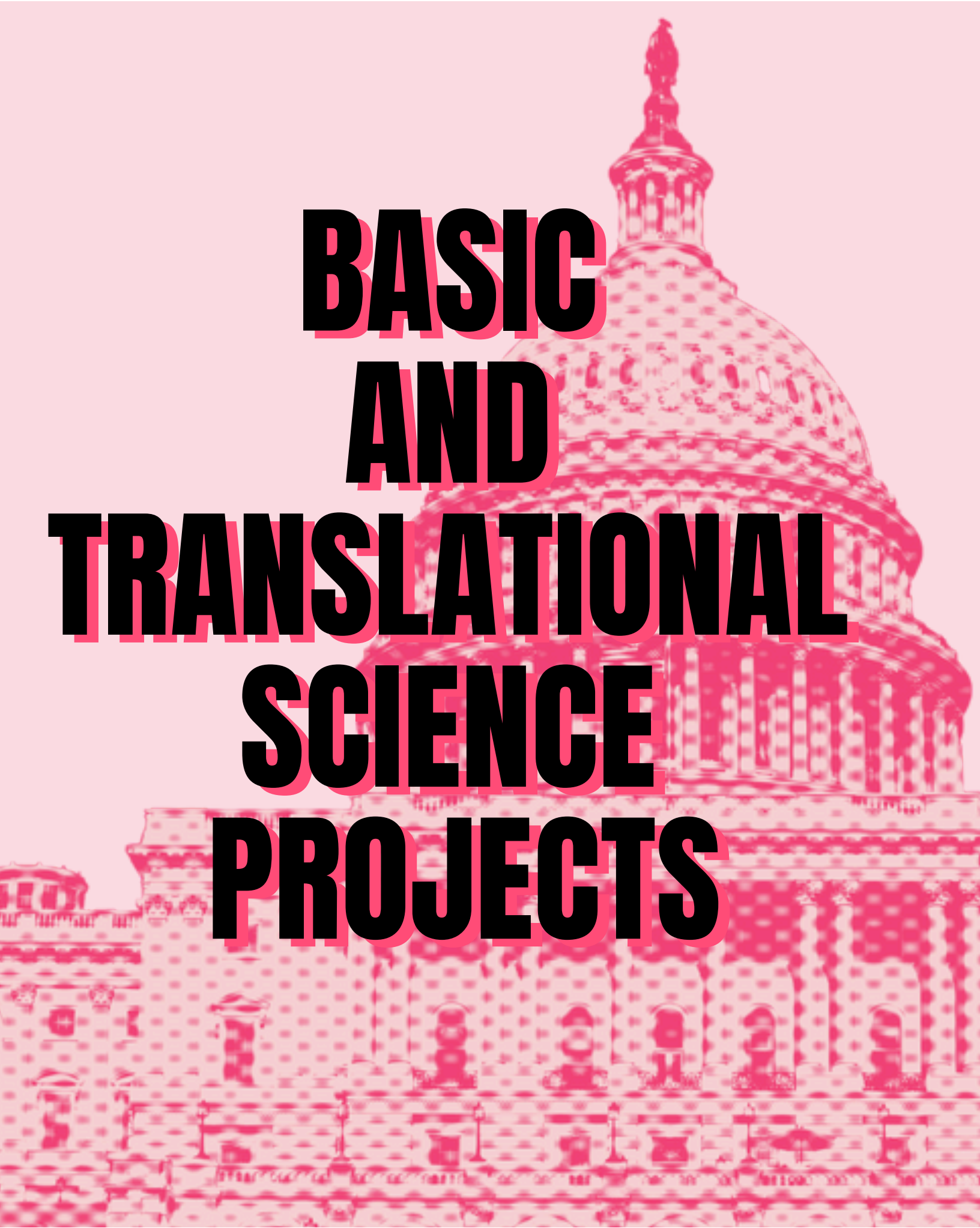
Petersen EE, Davis NL, Goodman D, et al. Racial/ethnic disparities in pregnancy-related deaths - United States, 2007-2016. MMWR Morb Mortal Wkly Rep. 2019;68(35):762-765. doi:10.15585/mmwr.mm6835a3

Daniels S, Lewis T. Next up for debate: LGBTQ people need and deserve tailored sexual and reproductive healthcare. Guttmacher Institute. 2020. Available at [illegible]

Wingo S, Ingraham N, Roberts SCM. Reproductive health care priorities and barriers to effective care for LGBTQ people assigned female at birth: A qualitative study. Womens Health Issues. 2018;28(1):19-27. doi:10.1016/j.whi.2017.09.005

Winter R, Lepage N, Roberts K, Kovacs B, Hosein J. Experiences of empathy training in healthcare: A systemic review of qualitative studies. Patient Education and Counseling. 2022;105(10):3017-3037.

Kaur GS S, Clark MA, Hester M. Reproductive [illegible] stigma and its impact on health outcomes: A review. J Health Commun. 2022;26(3):225-237.


BASIC
AND
TRANSLATIONAL
SCIENCE
PROJECTS

10

Breaking the Protocol: Revisiting the BIG 3 Upgrade for Patients on Anti-Platelet Agents with Minor Brain Injury

Nicholas Sookhoo[1], Omran Majumder[1], Jack Flanagan[1], Adam Ostrovsky[3], Amanda Reynolds[2], Rachel Caiafa[2], Nakesha King[2], Jason Ho[2], Jason Cheng[2], Jeff Nicastro[2], Ronald Simon[2]
[1]State University of New York Downstate Medical Center COM, [2] Maimonides Medical Center, [3]Sidney Kimmel Medical College at Thomas Jefferson University

Biography: *Nicholas Sookhoo is a second-year medical student at SUNY Downstate Medical Center with aspirations of becoming a surgeon. He graduated magna cum laude from Drexel University, earning a Bachelor of Science degree and recognition as a Pennoni Honors College Scholar. Nicholas has an extensive research Background, including roles in pediatric neurology, trauma surgery, and academic cell biology, with presentations at both national and regional conferences. His research focuses on improving surgical outcomes, bridging science and practice to enhance patient care. A passionate advocate for health equity, Nicholas contributes to multiple community and professional organizations, including the Brooklyn Free Clinic, White Coats for Black Lives, and Street Medicine Downstate. He also serves as an Advisory Council Member and Alumni Council Founder for the GlamourGals Foundation, demonstrating a commitment to intergenerational community support. Nicholas's work has been published in the Anesthesia & Analgesia journal, and he has co-hosted podcasts addressing critical topics like gender-affirming healthcare and death justice. His dedication to advancing surgery, leveraging research, and promoting health equity underscores his approach to medicine.*

Abstract

Background: Traumatic brain injury (TBI) affects millions annually, with significant mortality and morbidity. The Brain Injury Guidelines (BIG), established in 2014, stratify TBI management based on injury severity and clinical factors, including antiplatelet therapy. Current BIG protocols escalate patients on antiplatelet agents with minor injuries (BIG 1) to BIG 3, requiring resource-intensive interventions like repeat head CT (rHCT) and neurosurgical consultation. This study evaluates whether such escalation is warranted to optimize care without compromising safety.

Methods: A retrospective analysis of 196 patients aged >65 years with minor brain injuries (BIG 1) was conducted. The study assessed the relationship between antiplatelet therapy (aspirin or clopidogrel) and intracranial injury progression on rHCT. Statistical analysis included chi-square tests with an alpha level of 0.05. Data collection was derived from patient registries and medical records, though limitations such as incomplete documentation of DDAVP use were noted.

Results: Patients on antiplatelet therapy with BIG 1 injuries were not significantly more likely to experience intracranial injury progression on rHCT compared to those not on such therapy. These findings support prior institutional data, suggesting that automatic escalation to BIG 3 for these patients may not be necessary. While retrospective, the data provides evidence to validate aspects of the 2014 BIG guidelines for older populations. The small number of patients with injury progression underscores the need for further multicenter studies.

Conclusions: Revisiting BIG escalation criteria for patients on antiplatelet therapy could optimize resource allocation and improve TBI management. Evidence-based guidelines are essential to refining treatment pathways, enhancing resource utilization, and ensuring better patient outcomes.

Inspiration: This project was inspired by a desire to challenge resource-intensive practices that may not improve outcomes, particularly for older patients. Observing the impact of unnecessary interventions on healthcare efficiency and patient well-being drove my passion for optimizing TBI management. By questioning existing protocols, this study aims to pave the way for more personalized and evidence-based care. The findings underscore the importance of balancing safety with resource allocation, ultimately contributing to a future in medicine where treatment pathways are guided by both data and patient-centered values.

Basic and Translational Science Projects

Poster Snapshot

Breaking the Protocol: Revisiting the BIG 3 upgrade for patients taking anti-platelet agents with minor brain injury

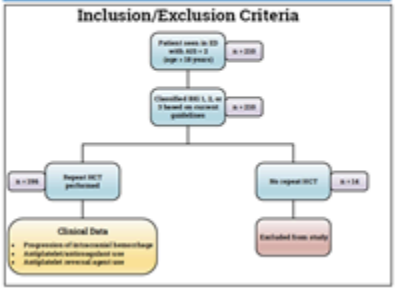
[1]Nicholas Sookhoo, [1]Omran Majumder, [1]Jack Flanagan, [1]Adam Ostrovsky MS, [1]Amanda Reynolds MD, [1]Rachel Casefa MD, [1]Nakeisha King MD, [1]Jason Ho MD, [1]Jason Cheng MD, [1]Jeff Nicastro MD, [1]Ronald Simon MD

[1] = Medical Center, Department of Trauma Surgery, Brooklyn, NY; [2] = SUNY Downstate Medical Center; [3] = Sidney Kimmel Medical College

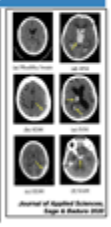
Introduction

Traumatic brain injury (TBI) contributes to 190 deaths each day affecting nearly 2.5 million people yearly. Trauma surgeons developed the Brain Injury Guidelines (BIG) in 2014 to evaluate and manage TBI using a scale of 1 (mild) to 3 (severe). The BIG score is based on the type, size, and distribution of intracranial hemorrhage, presence or absence of a skull fracture and fracture displacement, level of consciousness, neurologic examination findings and the pre-injury use of anticoagulants or anti-platelet agents. It also details management, including the need for repeat head CT (rHCT), neurosurgery (NSG) consultation, and hospital admission. The BIG enable adequate allocation of scarce resources for those in need while avoiding overtreatment for those with mild, often self-resolving conditions. Currently, BIG escalates TBIs from level 1 to level 3 for any patient on anticoagulant or anti-platelet agents. This requires hospital resources for an injury that, without its use, would not warrant such intervention. Previous data at this institution has investigated the role of anti-platelet agents such as aspirin and clopidogrel (Plavix) in the progression of intracranial hemorrhage in acute TBI for patients with an Abbreviated Injury Scale (AIS)=2. In this new data we evaluate 196 patients and hope to determine whether the upgrade of BIG 1 to BIG 3 is warranted in the face of anti-platelet agents.

Methods

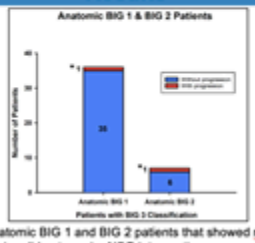


Methods cont.



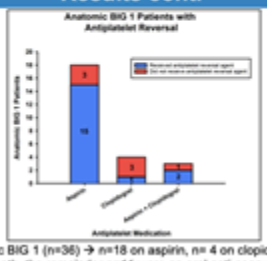
We retrospectively reviewed patients seen in the ED with an AIS=2. They were then classified as BIG 1, 2, or 3. Those on anticoagulants, with no rHCT, and/or an AIS≠2 were excluded. Charts were then reviewed for progression of injury on rHCT, and whether any neurosurgical intervention such as intracranial pressure monitoring, or craniotomy were performed. Patients were divided into Anatomic BIG 1 (n=36, BIG 3 on anti-platelets), Anatomic Big 2 (n=7, BIG 3 on anti-platelets) and True BIG 3 (n=153, not on anti-platelets). The anatomic BIG 1 and BIG 2 patients were analyzed for rHCT progression.

Results



- *The anatomic BIG 1 and BIG 2 patients that showed rHCT progression did not require NSG intervention.
- *No patient with an anatomic BIG 1 needed NSG intervention.

Results cont.



- Anatomic BIG 1 (n=36) → n=18 on aspirin, n= 4 on clopidogrel, n=3 on both, the remainder n=11 were on oral anti-coagulants as well as anti-platelet agents.

Discussion

Prior data from this study suggest that taking anticoagulant or anti-platelet medications does not increase the likelihood of injury progression on rHCT in patients with anatomic BIG 1 injuries. The 2014 BIG suggest that patients on aspirin or clopidogrel with anatomic BIG 1 injury require a rHCT or neurosurgery consultation. Evaluation of new patient data lends support in rethinking the upgrade of anatomic BIG 1 patients on aspirin or Plavix to BIG 3 due to the lack of progression on rHCT.

This study also serves as a retrospective validation for current BIG as it applies to an older populations. The sample analyzed here had a mean age of 67 years, whereas the original 2014 study population had a mean age of 40.8 years[3].

Our findings validate the 2014 BIG and suggest that rHCT and neurosurgical consultation may not be required to manage patients with morphologic BIG 1 injuries taking anti-platelet agents. Based on previous data from this institution and additional analysis of 29 new patients, the automatic promotion to BIG 3 while on anti-platelet agents appears unwarranted and will conserve hospital resources in TBI treatment.

Maimonides Medical Center

12

Comparing Neurobehavioral Profiles of Genetic Disorders with Shared Mechanisms

Dr. Sydney Jacobs[1], **Seyda Kilic**[2], Dr. LeeAnne Snyder[3], Dr. Katrina Boyer[1], Dr. Siddharth Srivastava[1]
[1]Boston Children's Hospital, [2]Tufts University, [3]Simons Foundation

Biography: *Şeyda Kilic, BS, is currently a community health worker at Mass General Brigham, supporting the Mobile Postpartum Care Unite, which is dedicated to improving maternal health outcomes and advancing health equity in Greater Boston. She addresses social determinants of health by connecting patients with essential resources, advocating for equitable care, and addressing unmet social needs. Şeyda is passionate about empowering communities and ensuring that individuals and families receive the comprehensive support they need to achieve better health outcomes and long-term well-being.With a Bachelor of Science in Community Health and Biology from Tufts University, Şeyda has a diverse Background in maternal health policy, public health advocacy, and nonprofit work supporting immigrant communities. In addition, she has contributed to research on rare neurodevelopmental disorders, specifically investigating how shared transcriptional regulation across genes may influence behavioral symptomatology. Her work examining racial and ethnic disparities in clinical trial enrollment has further fueled her commitment to increasing representation and access for historically marginalized populations. At the Future Physicians for Change conference, Şeyda will present findings from her research on neurodevelopmental disorders, exploring how advances in genetic testing can refine diagnosis, prognosis, and treatment approaches. Her experiences—spanning grassroots advocacy, coalition-building, and patient-centered research—have shaped her vision for a future where healthcare systems proactively address structural inequities. Set to begin medical school in Summer 2025, Şeyda is committed to a career in medicine, where she will continue engaging in impactful research that bridges clinical care and scientific discovery. She believes in the power of collaboration, storytelling, and policy reform to drive lasting change in healthcare.*

Abstract

Background: Neurodevelopmental disorders (NDDs) are often studied as distinct conditions, yet many share genetic underpinnings, particularly in genes regulating transcription. Advances in genetic testing have expanded our understanding of these disorders, but the extent to which they present with overlapping clinical symptoms remains unclear. This project aims to identify shared neurobehavioral patterns across four NDDs—SETBP1, HIVEP2, MED13L, and CSNK2A1—to improve diagnosis, prognosis, and treatment approaches.

Methods: We analyzed data from 115 individuals with pathogenic or likely pathogenic variants in SETBP1, HIVEP2, MED13L, and CSNK2A1, collected through Simons Searchlight. Participants ranged from 8 to 330 months old, and their adaptive, social-emotional, and behavioral functioning were assessed using caregiver-reported measures, including the Vineland Adaptive Behavior Scales (VABS-II), Social Responsiveness Scale (SRS), Social Communication Questionnaire (SCQ), and Child Behavior Checklist (CBCL). Statistical analyses, including Kruskal-Wallis tests and correlation analyses, were conducted to compare symptom profiles across genetic conditions and explore associations with developmental factors such as birth weight, gestational age, and neurological comorbidities.

Results: Overall, neurobehavioral profiles were similar across the four genetic conditions, suggesting shared underlying mechanisms. However, preschool-aged participants with the CSNK2A1 variant exhibited significantly higher internalizing symptoms (e.g., anxiety, withdrawal, emotional reactivity) compared to those with the SETBP1 variant. Across all groups, a greater number of neurological diagnoses correlated with increased behavioral symptoms and lower adaptive functioning. Additionally, individuals with an autism diagnosis showed lower adaptive functioning and greater social difficulties, but their diagnosis did not correlate with overall behavioral or emotional symptoms.

Conclusions: Our findings suggest that transcription-related genetic variants contribute to overlapping neurobehavioral symptoms, reinforcing the importance of recognizing shared clinical features across NDDs. Identifying at-risk populations based on genetic profiles may aid early intervention strategies, particularly for conditions like CSNK2A1, where emotional challenges may be more pronounced in early childhood.

Inspiration: My passion for this research stems from a commitment to bridging clinical care and scientific discovery to improve patient outcomes, particularly in neurology. Understanding the genetic and neurobehavioral overlap in NDDs can help refine diagnostic tools and tailor interventions to significantly impact a child’s development. Early diagnosis in pediatric care allows for timely interventions that enhance cognitive, social, and emotional outcomes. This work highlights the importance of integrating genetic insights into clinical practice for equitable access to precision medicine. By advancing personalized approaches in care, I aim to help reduce healthcare disparities and provide families with the resources they need to navigate complex diagnoses.

Basic and Translational Science Projects

13

Development of a Novel Phage Display Protocol to Identify a Peptide Diagnostic for Early-Stage Epithelial Ovarian Cancer

Vera Rivard[1], Jennifer Dimitrov[1], Princesa Gonzalez[1], Hailey Lombardi[1], Colin McGarry[1], John Nangle[1], Ulises Orellana[1], Callum Park[1], Riley Stogsdill[1], Shannon Hogan[1]
[1]Regis College, Watson-Hubbard Science Center

Biography: *Tenacious and detail-oriented biology major with one year's hands-on experience in discovering a potential early-stage diagnostic peptide. Driven to further my knowledge of interdisciplinary approaches in the medical field by exploring how different expertise collaborate to improve healthcare outcomes and advance innovation.*

Abstract

Background: Epithelial ovarian cancer (EOC) is among the deadliest cancers affecting women, responsible for up to 5% of cancer-related deaths. In stages I and II, there are very few symptoms and no reliable screening methods. These factors, in combination, lead to high mortality rates because patients are not diagnosed until stages III or IV. Soluble Folate Receptor Alpha (sFOLR1) is overexpressed in EOCs in all stages of disease and is a potential target for biotherapeutic inhibitors. A fluorescently tagged peptide binding specifically to sFOLR1 could serve as a non-invasive diagnostic tool for early-stage detection. Peptide phage display is an experimental platform that may be used to identify potential diagnostic or therapeutic peptides at low cost and in a relative short time period.

Methods: We produced a novel phage display protocol using a cyclized 7-mer peptide library to screen recombinant sFOLR1, showing increasing output at each round throughout the screening campaign. Following third round enrichment, PCR amplification of DNA sequences encoding the putative binding peptide was performed. These amplicons will be sequenced and analyzed to assess sequence collapse, which may indicate a potential biotherapeutic. If available, a candidate peptide will be synthesized with a C-terminal biotin tag and evaluated through our target-based ELISA using clinically relevant sFOLR1 concentrations.

Results: Our screening campaign demonstrated progressive enrichment of potential sFOLR1-binding phage throughout all three rounds of selection. Post-third-round sequence amplification and purification is currently being performed and once all samples meet sequencing criteria, they will be sent for sequencing and we will further characterize, looking for sequence collapse.

Conclusion: Our approach produced successfully enriched potential diagnostic peptides targeting sFOLR1. Upon further validation, these peptides may hold promise as non-invasive diagnostic tools for early-stage ovarian cancer detection. We aim to improve clinical outcomes through earlier intervention for all ovarian cancer patients.

Inspiration: This research is driven by the need for an affordable and equitable blood screening assay for early detection of ovarian cancer. Our subsequent findings could significantly improve patient survival rates in women, 50 years of age and older. Lastly, this tool could also be used to track chemotherapeutic outcomes, enhancing these approaches for ovarian cancer patients.

Basic and Translational Science Projects

Poster Snapshot

Development of a Novel Phage Display Protocol to Identify a Peptide Diagnostic for Early-Stage Epithelial Ovarian Cancer

Vera Rivard[1], Jennifer Dimitrov[1], Princesa Gonzalez[1], Hailey Lombardi[1], Colin McGarry[1], John Nangle[1], Ulises Orellana[1], Callum Park[1], Riley Stogsdill[1], Shannon Hogan[1]

[1]Regis College, Watson-Hubbard Science Center, 235 Wellesley St., Weston, Ma, 02493

Abstract

Epithelial ovarian cancer (EOC) is among the deadliest cancers affecting women, responsible for up to 5% of cancer-related deaths. In stages I and II, there are very few symptoms and no reliable screening methods. These factors, in combination, lead to high mortality rates because patients are not diagnosed until stages III or IV. Soluble Folate Receptor Alpha (sFOLR1) is overexpressed in EOCs in all stages of disease and is a potential target for biotherapeutic inhibitors. A fluorescently tagged peptide binding specifically to sFOLR1 could serve as a non-invasive diagnostic tool for early-stage detection. Peptide phage display is an experimental platform that may be used to identify potential diagnostic or therapeutic peptides at low cost and in a relative short time period. However, the synthesized peptide did not show sufficient affinity in initial testing. Next, the team modified the negative selection protocol to improve specificity and achieved a significant reduction in non-specific binding. A significant reduction in titer was achieved with the new negative selection protocol. We have begun amplifying phage DNA inserts and will move to DNA sequencing next. A successful high-affinity peptide could be used as a universal screening tool, potentially reducing ovarian cancer mortality by over 50% in women over 50 years of age.

Keywords: Phage display, folate receptor alpha 1 (FOLR1), ovarian cancer, diagnostic peptide

Introduction

Epithelial ovarian cancer (EOC) is among the deadliest cancers affecting women, responsible for up to 5% of cancer-related deaths. In stages I and II, there are very few symptoms and no reliable screening methods. These factors, in combination, lead to high mortality rates because patients are not diagnosed until stages III or IV. Soluble Folate Receptor Alpha (sFOLR1) is overexpressed in EOCs in all stages of disease and is a potential target for biotherapeutic inhibitors. A fluorescently tagged peptide binding specifically to sFOLR1 could serve as a non-invasive diagnostic tool for early-stage detection. Peptide phage display is an experimental platform that may be used to identify potential diagnostic or therapeutic peptides at low cost and in a relative short time period.

Phage display is a technique used to generate peptides that specifically bind to a target protein. By cloning DNA sequences into bacteriophages and creating a phage display library, peptides can be isolated that bind to the target protein. In this study, a peptide phage display selection campaign was conducted to find a high-affinity binder for soluble FOLR1 (sFOLR1). While a specific sequence was identified, subsequent testing showed that the peptide failed to bind to sFOLR1 in a target-based ELISA. Further investigation revealed that the negative selection sub-protocol may need optimization to eliminate non-specific binding phages and facilitate the identification of a genuine binding peptide. The researchers have altered the negative selection sub-protocol and are subsequently amplifying phage insert DNAs from this campaign to determine if sequence collapse has been achieved using this novel method.

Materials and Methods

Peptide Phage Display Selection

We performed a peptide phage display screening campaign using recombinant sFOLR1 (R&D Systems, Minneapolis, MN) as the target. The phage library that was used was the Ph07 library (New England Biolabs (NEB), Ipswich, MA). Manufacturer's protocols were followed with changes made to the post-round 1, negative selection sub-protocol. Here, after the library was added the blocked beads, one negative selection was performed in an incubator at 37°C for 10 min and one for 10 min at room temperature. Both samples were shaken at 500rpm on a platform shaker. The libraries that resulted from these negative selections were combined to ensure there were enough viruses present for phage library amplification.

Plaque Picking and PCR Amplification of Phage Insert DNA

Blue plaques from X-gal/IPTG plates were picked using a sterile 20µl pipet tip. Plaques were soaked in 10µl of water for 10 min. at room temperature. Next, 5ml of this solution was used in a 50µl PCR using the Phusion® High-Fidelity PCR Kit (NEB, Ipswich, MA) following the manufacturer's protocols. A standard agarose gel electrophoresis protocol was used to show amplified phage DNA inserts.

Results

Round	Input (pfu/ml)	Output (pfu/ml)
1	1.00E+11	5.70E+05
NS	5.30E+06	8.30E+04
2	1.80E+11	7.40E+06
3	2.60E+11	5.30E+07

Table 1. Phage Display Results for All Selection Rounds, and Negative Selection (NS).
The input and output titers of phage for all rounds in the selection campaign, including the newly developed negative selection. Here, the output from round one is used as the input for the negative selection.

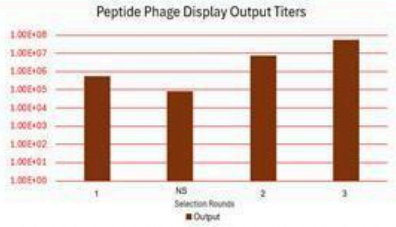


Figure 1. Peptide Phage Display Output Titers.
Representative phage titers for each round of selection, including the updated negative selection sub-protocol.

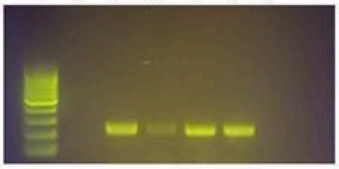


Figure 2. Agarose Gel Showing 234bp Amplified Insert DNA From Multiple Phage
1. Molecular Weight Ladder; 2. Blank ; 3. Phage Insert 1; 4. Phage Insert 2; 5. Phage Insert 3.; 6. Phage Insert 4; 7. Negative Control

Discussion

Our screening campaign demonstrated progressive enrichment of potential sFOLR1-binding phage throughout all three rounds of selection. Post-third-round sequence amplification and purification is currently being performed and once all samples meet sequencing criteria, they will be sent for sequencing and we will further characterize, looking for sequence collapse. This data show that our newly generated negative selection protocol achieves a 6.87-fold removal of, potentially, non-specific binders from the output of round one; see Table 1. From here, we were able to achieve a 12.98 -fold enrichment of peptide phage binders; see Figure 1. Our previous selection campaign did not show a reduction in titer post-negative selection. The enrichment factor was also less than 10-fold post round three in this experimentation. We have developed a reliable plaque PCR protocol for the amplification of DNA inserts which ultimately code for the peptides displayed on the M13 phage in the Ph07 library; see Figure 2. We will continue to amplify DNA inserts so that we can determine if sequence collapse occurs among the phage inserts. Our approach produced successfully enriched potential diagnostic peptides targeting sFOLR1. Upon further validation, these peptides may hold promise as non-invasive diagnostic tools for early-stage ovarian cancer detection. We aim to improve clinical outcomes through earlier intervention for all ovarian cancer patients. Post-third-round sequence amplification and purification has been performed and will be sent for sequencing, and we will further characterize, looking for sequence collapse.

This research is driven by the need for an affordable and equitable blood screening assay for early detection of ovarian cancer. Our subsequent findings could significantly improve patient survival rates in women, 50 years of age and older. Lastly, this tool could also be used to track chemotherapeutic outcomes, enhancing these approaches for ovarian cancer patients. This could have the potential of reducing mortality rates by over 50% in women over 50 years of age[1].

References

[1] Rivard, V., Dimitrov, J., Park, C. et al. Development of a Novel Phage Display Protocol to Identify a Peptide Diagnostic for Early-Stage Epithelial Ovarian Cancer. Poster Presentation, Regis College, Weston, MA, 2024.

REGIS
A CATHOLIC UNIVERSITY IN GREATER BOSTON

15

Exploring Hypermobile Ehlers-Danlos Syndrome Related Phenotypes in a Novel Mouse Model with Col5a1 Missense Mutations

Rory Sheng[1,2], Daphine Anand[2], Shirley Zhang[1,2], Ali Nunes[2], Dr. Mainak Sarkar[2], Rohan Mandhan[2], Dr. Mariana Kersh[1], Carly Lockard[3], Dr. Bruce Damon[1,3], Dr. Amy Wagoner Johnson[1,2], Dr. Christina Laukaitis[1,2]
[1]Carle Illinois College of Medicine at the University of Illinois Urbana-Champaign, [2]Carl R. Woese Institute for Genomic Biology at the University of Illinois Urbana-Champaign, [3]Stephens Family Clinical Research Institute at Carle Health

Biography*: Rory is currently a second year medical student at the Carle Illinois College of Medicine at the University of Illinois Urbana-Champaign.*

Abstract

Background: The Ehlers-Danlos Syndromes (EDS) are a clinically and genetically heterogeneous collection of connective tissue disorders with 13 currently recognized subtypes. A definite diagnosis of 12 of the EDS subtypes relies on identification of causative genetic variants, except for the hypermobile Ehlers-Danlos Syndrome subtype (hEDS). This project aims to provide a better understanding of the genetic basis of hEDS. While classical EDS (cEDS) can result from a glycine substitution in the COL5A1 or COL5A2 gene, disrupting the Gly-X-Y repeat structure in type V collagen, many people with hEDS have COL5A1 or COL5A2 variants at the X or Y position of the Gly-X-Y repeat. We hypothesize that these X or Y variants are responsible for some cases of hEDS.

Methods: We have generated a transgenic mouse line with a missense point mutation changing the X position of one of the Gly-X-Y repeats in Col5a1. As positive controls, we obtained mice with haploinsufficient knockout of Col5a1 and generated an additional transgenic mouse line with a missense point mutation at the glycine position of the Gly-X-Y repeat of Col5a1, both of which model cEDS. To characterize these three lines, we are: (1) tracking their daily weights from P0 (postnatal day 0) to P30 and weekly weights from P35 to P180; (2) conducting grip strength test at P30, P90, and P180; and (3) performing a broad pathological survey of multiple organs at P90. In addition, we are conducting open-field test to gather more behavioral data, have generated primary fibroblasts from ear tissue of the three lines to study the mechanical properties of the cells and their surrounding extracellular matrix, are evaluating gait and mechanical properties of tissues, and are imaging at tendons and ligaments at various scales.

Results: These evaluations have allowed us to identify unique features of the novel the cEDS and hEDS mouse lines. The daily and weekly weight data, grip strength and open-field test results, and the histopathology survey results of multiple organs for the three lines will be presented in April.

Conclusions: This ongoing project will contribute to addressing the dire need for an improved clinical definition of hypermobile Ehlers-Danlos Syndrome and its delineation from other hypermobility-causing disorders.

Inspiration: The search for a genetic cause of hEDS will allow for a more accurate and precise diagnosis for current and future patients with hypermobile Ehlers-Danlos Syndrome.

Basic and Translational Science Projects

16

Food-based approach for oral cancer prevention and treatment: Lessons learned from in vivo and clinical studies

Amanda Penn[1], Neha Bhandari[1], Riley Petrovich[1], Dr. Anupam Bishayee[1]
[1]Lake Erie College of Osteopathic Medicine Bradenton

Biography: *Amanda Penn is a third year medical student at Lake Erie College of Osteopathic Medicine in Bradenton Florida. She started performing research during her first year at LECOM and has progressed to being a research mentor to a group of second year students. She has previous research experience during her undergraduate career at the University of Central Florida in the field of forensics, and is currently working on other research products during her rotation years. She is doing her rotations in Winter Haven Florida. After having some experience in each core rotation, she has gravitated toward the field of obstetrics and gynecology, and plans to do her residency in that field.*

Abstract

Background: Oral cancer is a disease with high mortality and rising incidence worldwide. Lack of early detection markers, exorbitant healthcare costs, and other risk factors necessitate improvements in preventative and treatment modalities. Although fragmentary literature on the anti-oral cancer effects of plant products has been published, a comprehensive analysis of all available in vivo and clinical findings is lacking. The objective of this analysis is to investigate all currently available in vivo and clinical data concerning edible plants and their effects on oral cancer.

Methods: A comprehensive evaluation of oral cancer preventative or therapeutic effects of dietary plants was conducted following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. The databases used included PubMed Science Direct, Scopus, and Web of Science. Animal studies were screened for bias with a Risk of Bias (RoB) tool developed by the Systematic Review Centre for Laboratory Animal Experimentation (SYRCLE). An exhaustive analysis was performed and results from each study were aggregated, grouped by plant source, and presented by study type and chronology.

Results: Data from in vivo reports showed decreased oral tumor incidence, multiplicity, volume, weight, and burden due to dietary plant treatment. Many studies revealed several mechanistic actions, including the modulation of various signaling pathways, such as antiproliferation, cell cycle regulation, apoptosis, and anti-angiogenesis. Administration of dietary plants in clinical trials demonstrated the ability of these agents to decrease the incidence of oral cancer.

Conclusion: Our study supports the use of dietary plants for oral cancer prevention and intervention. The current literature surrounding the use of these agents both in vivo and in clinical trials is promising in terms of efficacy and tolerability. Nevertheless, further research is required to determine the mechanistic effects of these dietary compounds, and additional mechanistic in vivo experiments and randomized clinical trials are required.

Inspiration: Worldwide, oral cancer is the seventh most common cancer in incidence and ninth most frequent cause of cancer-related mortality. Current treatment options, including surgery, chemotherapy, and radiation therapy, are effective but come with unwarranted side effects. Considering the severity of the disease and current treatment limitation, there is an urgent need for complementary and integrative treatments for oral cancer. The preventative and therapeutic potential of edible plants, as evidenced from our analysis, may advance evidence-based clinical practice to decrease the overall incidence of oral cancer.

Basic and Translational Science Projects

Poster Snapshot

Food-based approach for oral cancer prevention and treatment: Lessons learned from *in vivo* and clinical studies

Amanda Penn, OMS3; Neha Bhandari, OMS3; Riley Petrovich, OMS3; Anupam Bishayee, Ph.D.
Department of Pharmacology, College of Osteopathic Medicine, Lake Erie College of Osteopathic Medicine, Bradenton, FL 34211

Abstract

Background: Oral cancer is a disease with high mortality and rising incidence worldwide. Although fragmentary literature on the anti-oral cancer effects of plant products has been published, a comprehensive analysis is lacking. The objective of this analysis it to investigate all available *in vivo* and clinical data concerning edible plants and their effects on oral cancer.

Methods: The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines were employed to query authentic databases, such as PubMed, ScienceDirect, Scopus, SpringerLink, and Web of Science.

Results: Data from *in vivo* reports showed decreased oral tumor incidence, multiplicity, volume, weight, and burder due to dietary plant treatment. Many studies revealed mechanistic actions, including modulation of various signaling pathways. Administration of dietary plants in clinical trials demonstrated the ability of these agents to decrease the incidence of oral cancer.

Conclusion: Our study supports the use of dietary plants for oral cancer prevention and intervention. The current literature surrounding the use of these agents both *in vivo* and in clinical trials is promising in terms of efficacy and tolerability. Nevertheless, further research is required to determine the mechanistic effects of these dietary compounds, and additional mechanistic *in vivo* experiments and randomized clinical trials are required.

Inspiration: Worldwide, oral cancer is the seventh most common cancer in incidence and ninth most frequent cause of cancer-related mortality. Current treatment options, including surgery, chemotherapy, and radiation therapy, are effective but come with unwarranted side effects. Considering the severity of the disease and current treatment limitation, there is an urgent need for complementary and integrative treatments for oral cancer. The preventative and therapeutic potential of edible plants, as evidenced from our analysis, may advance evidence-based clinical practice to decrease the overall incidence of oral cancer.

Introduction

- Oral cancer encompasses a cluster of neoplasms that affect the lip, floor of the mouth, buccal mucosa, tongue, retromolar trigone, hard palate, and upper and lower gums (Montero et al., 2015).
- In 2020 alone, there were approximately 377,713 new oral cancer cases and 177,757 deaths globally (Tranby et al., 2022).
- Conventional treatments may include surgery, chemotherapy, radiotherapy, or immunotherapy (Inchingolo et al., 2020); however, adverse effects such as xerostomia, dysphagia, and orofacial pain necessitate identification of alternative options (Togni et al., 2021).
- Dietary plants have historically been used as remedies for various conditions (Prakash et al., 2021), including malignancies, and their secondary metabolites have been suggested to possess synergistic activity (Peritore et al., 2019).
- Compared to pharmacological treatments, whole plants or their extracts possess advantages in terms of ease of production and sustainability, and may be efficacious for dietary cancer prevention irrespective of socioeconomic barriers.
- This review aims to fill a gap in current literature by presenting an up-to-date and comprehensive analysis of preclinical and clinical data investigating the role of various dietary plants, including their extracts, fractions, and commercial products, in the prevention and treatment of oral cancer with focus on their underlying cellular and molecular mechanisms of action.

Methods

Figure 1. PRISMA literature search and selection process flowchart.

The Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) criteria (Liberati et al., 2009; Page et al., 2021) was used for the selection of articles as demonstrated in **Figure 1**.

- Databases queried: PubMed, Science Direct, Scopus, and Web of Science
- Keywords searched: "Oral squamous cell carcinoma", "oral cancer", "treatment", "therapy", "prevention", "anticancer", "*in vivo*", "clinical trial"
- Inclusion criteria: Published; English language; specific to oral cancer; whole plants or impure extracts; monotherapy
- *In vivo* studies were further evaluated for bias utilizing a risk of bias (RoB) tool developed by the SYstematic Review Centre for Laboratory animal Experimentation (SYRCLE), which is an adaptation of the Cochrane Collaboration RoB tool (Hooijmans et al., 2014) as depicted in **Figure 2.**

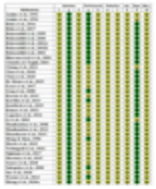


Figure 2. Results of the risk of bias assessment for each of the 36 *in vivo* studies included in this review according to the tool developed by SYRCLE. Unknown. Yes.

Results

- *In vivo* analyses showed a decrease in tumor burden, tumor incidence, multiplicity, volume, and weight, as well as hyperplastic and dysplastic changes.
- Several cancer pathways, including PI3K/AktmTOR, VEGF, and NF-κ , were shown to be negatively regulated by dietary plants and their extracts based on *in vivo* results.
- Other primary mechanistic targets include apoptotic regulatory proteins (caspase-3, caspase-7, caspase-9, Bcl-2, and Bax) and cell cycle regulators (CDKs and p53).
- Clinical trials demonstrated the ability of select agents to reduce the risk of oral carcinogenesis.
- Plant products were well-tolerated by participants in clinical trials.

Results (cont.)

Table 1. *In vivo* studies demonstrating the anti-oral cancer effects of edible plant extracts.

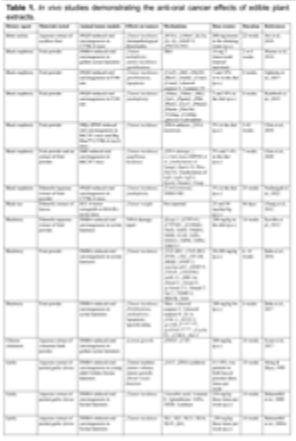
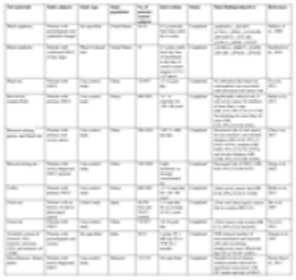


Table 2. Clinical studies on dietary plant products for oral cancer prevention and intervention.



Results (cont.)

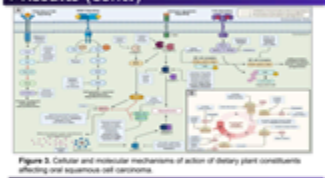


Figure 3. Cellular and molecular mechanisms of action of dietary plant constituents effecting oral squamous cell carcinoma.

Conclusion

Executive summary:

- An analysis of the anticancer effects of dietary plants and their extracts, fractions, and commercial products against oral cancer was performed by examining available data from *in vivo* studies as well as clinical trials with an emphasis on associated mechanisms of action.
- Dietary plants alter cell signaling pathways, leading to anti-oral cancer effects by inhibiting cell motility and invasion, suppressing proliferation and metastasis, decreasing viability, upregulating apoptotic mechanisms, and increasing cell cycle arrest (**Tables 1 & 2** and **Figure 3**).
- Due to the abundant anticancer effects represented by dietary plants, it is clear that the plant-derived agents possess the potential for prevention and treatment of oral cancer.

Challenges:

- Further investigation is necessary to delineate the mechanisms of action due to insufficient explanation of anticancer findings in various studies mentioned in this review.
- There are limited amounts of clinical studies utilizing dietary plants as a prevention or treatment for oral cancer.

Future research:

- Future studies should address the sources of bias within the animal handling protocol in order to progress *in vivo* animal model experiments towards human clinical trials.
- Different methodologies may be used by investigators to better characterize the efficacy of dietary plants in the context of oral cancer, such as using different edible plants and utilizing new extraction techniques.
- An ideal clinical trial would evaluate a first-line therapy plus plant-based adjuvant against first-line therapy alone.

References

1. Hooijmans CR, Rovers MM, de Vries RB, Leenaars M, Ritskes-Hoitinga M, Langendam MW. SYRCLE's risk of bias tool for animal studies. BMC Med Res Methodol. 2014;14:43. doi:10.1186/1471-2288-14-43
2. Inchingolo F, Santacroce L, Ballini A, Topi S, Dipalma G, Haxhirexha K, et al. Oral Cancer: A Historical Review. International Journal of Environmental Research and Public Health. 2020; 17:3166. doi: 10.3390/ijerph17093166
3. Liberati A, Altman DG, Tetzlaff J, Mulrow C, Gøtzsche PC, Ioannidis JP, et al. The PRISMA statement for reporting systematic reviews and meta-analyses of studies that evaluate healthcare interventions: explanation and elaboration. Bmj. 2009;339:b2700. doi:10.1136/bmj.b2700
4. Montero PH, Patel SG. Cancer of the oral cavity. Surg Oncol Clin North Am. 2015;24:491-508. doi:10.1016/j.soc.2015.03.008
5. Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. Br Med J. 2021;372:n71. doi: 10.1136/bmj.n71
6. Peritore AF, Siracusa R, Crupi R, Cuzzocrea S. Therapeutic Efficacy of Palmitoylethanolamide and Its New Formulations in Synergy with Different Antioxidant Molecules Present in Diets. Nutrients. 2019;11:2175. doi:10.3390/nu11092175
7. Prakash S, Radha, Kumar M, Kumari N, Thakur M, Rathour S, et al. Plant-Based Antioxidant Extracts and Compounds in the Management of Oral Cancer. Antioxidants. 2021;10:1356. doi:10.3390/antiox10091356
8. Togni L, Mascitti M, Ingrosso A, Alia S, Santoro D, Bambini A, et al. Treatment-Related Dysgeusia in Oral and Oropharyngeal Cancer: A Comprehensive Review. Nutrients. 2021;13:3325. doi:10.3390/nu13103325
9. Tranby EP, Hasdan LJ, Tomar SL, Kelly AL, Fager GL, Buckley M, et al. Oral Cancer Prevalence, Mortality, and Costs in Medicaid and Commercial Insurance Claims Data. Cancer Epidemiol Biomarkers Prev. 2022;31:1869-1877. doi:10.1158/1055-9965.EPI-22-0114

18

Lymph node lymphangiogenesis constrains the germinal center structure to enhance selection and functional antibody production during cutaneous virus infection

Mr Luan Firmino Cruz[1], Ms Tenny Mudianto[1], **Lina Fikri**[2], Ms Ritika Luthra[1], Mrs Amanda Lund[1], Ms Carla Nowosad[1]
[1]NYU Grossman Sch. of Med., [2]Tufts University

Biography: *Lina Fikri is from Casablanca, Morocco. She is a recent graduate of Tufts University, where she earned a B.S. in Biochemistry and a minor in German. During her undergraduate studies, she conducted research at the Tufts University School of Medicine, focusing on the role of epigenetics in the development of breast cancer. She also interned at the NYU Grossman School of Medicine, studying the link between lymphangiogenesis and the adaptive immune response. Currently, Lina works as both a clinical assistant and a study coordinator in a gastroenterology and allergy clinic in Boston, where she hopes to increase the understanding of disease and improve patients' quality of life. She is also passionate about education and mentorship. In the future, she wishes to become a physician who incorporates scientific innovation into her patients' care. Her hobbies include drawing, working out, and learning languages.*

Background: Viral infections drastically alter the immune system. During cutaneous viral infection, we previously observed vascular endothelial growth factor receptor 2 (VEGFR2)-dependent lymphangiogenesis, which led to lymphatic sprouting around B cell follicles during germinal center (GC) reaction; however, the impact of lymphatic growth on the functional germinal center response is yet to be investigated. This project aims at investigating how lymphangiogenesis affects the immune response in GCs in the face of viral stimulus to further the understanding of the role of the lymphatic system in antiviral immunity.

Methods: To investigate the impact of perifollicular lymphangiogenesis in the GC response, we used a localized infection by vaccinia virus (VacV, scarification) to induce GCs in draining LNs of mice lacking expression of VEGFR2 in lymphatic vessels. LN tissues were immunostained and visualised via photon microscopy.

Results: With VEGFR2-deficient lymphatic vessels, draining LNs show decreased perifollicular lymphatic growth and a surprising increase in GC area, with associated with lower levels of VacV-specific IgG2b. This led to investigating whether the change in GC structure altered functionality. To do so, we blocked VEGFR2 in GC B cells fate-mapper Aicda cre/+ Rosa26 confetti/confetti mice. Here, GCs exhibited less selection, which together with reduced VacV-specific IgG2b indicates that lymphatic dependent GC restraint optimizes GC fitness and thereby anti-viral immunity.

Conclusion: Our findings suggest that perifollicular lymphangiogenesis, mediated by VEGFR2 in lymphatic vessels, plays a crucial role in regulating GC structure and function. The absence of VEGFR2-induced lymphatic growth leads to altered GC architecture and reduced selection, highlighting the importance of lymphatic regulation for optimal GC selection and effective anti-viral immunity.

Inspiration: It is well known that the immune response and the lymphatic system are deeply intertwined; however, the question of how structure affects functionality is still under investigated. This led me to further study the interplay between the two. I was also drawn to developing basic research skills through various methods associated with this project, from the precise cutaneous infection of mice to producing colorful images of GCs surrounded by fluorescent networks of lymphatic vessels. Most importantly, the global burden of viral infections such as influenza on healthcare systems cannot be ignored, and a more comprehensive understanding of the immune system is essential to enhance the effectiveness of vaccines.

Basic and Translational Science Projects

19

Sporadic Hemiplegic Migraine and Random Forest – A Diagnosis After 13 Years Using Machine Learning

Anusha Reddy[1]
[1]San Juan Bautista SOM

Biography: *Anusha Reddy is a medical student at San Bautista School of Medicine.*

Abstract

Background: Migraines are a neurological condition characterized by an intense unilateral throbbing of the head. Sporadic hemiplegic migraine is a rare type of migraine with aura that causes weakness on one side of the body.

Case Presentation: The patient is a 23-year-old female who has a 13-year history of migraine. For each migraine attack, symptoms first present as blind spots. Symptoms progress to tingling and numbness limited to one side of the body (hemiplegia), beginning at the arm or leg and moving up to the neck and face. Symptoms culminate in a unilateral migraine headache with severe throbbing pain. Alleviating factors include taking Advil to help relieve some of the pain associated with the intense headache. Aggravating factors include bright lights, loud sounds, and strong smells. The first onset was at ten years old. The patient takes two 200 mg Advil tablets when the headache begins. This helps reduce the one-sided head pain, but does not eliminate it. The headache pain averages five hours. The day after the migraine attack, the patient experiences a mild head throbbing that can be worsened by jumping or climbing stairs. This sensation resolves by the next day. The patient does not experience any lasting effects of the migraine.

Random Forest, a type of sophisticated machine learning algorithm that utilizes various decision trees in order to make predictions using many different sets of data, was utilized for this case. This randomness introduces variability among individual decision trees and leverages the power of the ensemble technique, which ensures that each tree focuses on different aspects of data. This leads to a more accurate overall prediction performance.

Results: With this patient's migraine data, the Random Forest model provided an accuracy of 100% for sporadic hemiplegic migraine.

Conclusion: Healthcare professionals should utilize machine learning tools to aid them in reaching a diagnosis in a more efficient manner.

Inspiration: When the patient experienced the symptoms of a migraine for the first time at ten years old, they were given the diagnosis of migraines. However, the symptoms of blind spots and hemiplegia were indicative of a specific type of migraine: sporadic hemiplegic migraine. This diagnosis, however, was not first given by any of the healthcare professionals the patient had visited. When the characteristics of the patient's migraine were input into the random forest algorithm, it gave the diagnosis of sporadic hemiplegic migraine. After 13 years, an answer was finally provided.

Poster Snapshot

Sporadic Hemiplegic Migraine and Random Forest – A Diagnosis After 13 Years Using Machine Learning

Anusha Reddy[1], Ajit Reddy
[1]San Juan Bautista School of Medicine

Background

Migraine or migraine headache is a neurological condition characterized by an intense unilateral throbbing of the head.[1] Sporadic hemiplegic migraine (SHM) is a rare type of migraine with aura that causes weakness on one side of the body.[2]

Case Presentation

The patient is a 23-year-old female who has a 13-year history of migraine. For each migraine attack, symptoms first present as blind spots. Symptoms progress to tingling and numbness limited to one side of the body (hemiplegia), beginning at the arm or leg and moving up to the neck and face. Symptoms culminate in a unilateral migraine headache with severe throbbing pain. Alleviating factors include taking Advil to help relieve some of the pain associated with the intense headache. Aggravating factors include bright lights, loud sounds, and strong smells. The first onset was at ten years old. Possible triggers for each migraine attack could include stress, sleep deprivation, skipping meals, and dehydration. The patient takes two 200 mg Advil tablets when the headache begins. This helps reduce the one-sided head pain, but does not eliminate it. Additionally, the patient has noticed that if, while experiencing a migraine, a meal is had without taking Advil, emesis will result; but, if, while experiencing a migraine, Advil is taken and then a meal is had, emesis will not result. The headache pain averages five hours. The day after the migraine attack, the patient experiences a mild head throbbing that can be worsened by jumping or climbing stairs. This sensation resolves by the next day. The patient does not experience any lasting effects of the migraine.

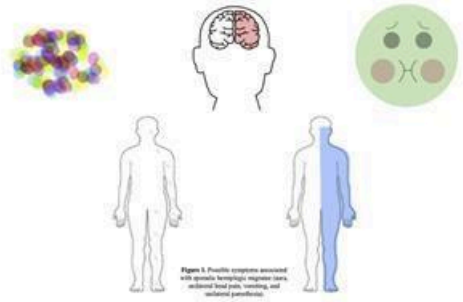


Figure 1. Possible symptoms associated with sporadic hemiplegic migraine (aura, unilateral head pain, vomiting, and unilateral paresthesia).

Methods

Random Forest is a type of sophisticated machine learning algorithm that utilizes various decision trees in order to make predictions using many different sets of data. This randomness introduces variability among individual decision trees and leverages the power of the ensemble technique, which ensures that each tree focuses on different aspects of data. This leads to a more accurate overall prediction performance.[3]

Results

With this patient's migraine data, the Random Forest model provided an accuracy of 100% for sporadic hemiplegic migraine.

Data Attributes

Duration (in days) = 1	Vomiting (no - 0, yes - 1) = 1	Dysarthria (no - 0, yes - 1) = 0	Ataxia (no - 0, yes - 1) = 1
Frequency (per month) = 1	Phonophobia (no - 0, yes - 1) = 1	Vertigo (no - 0, yes - 1) = 0	Consciousness (no - 0, yes - 1) = 0
Location (none - 0, unilateral - 1, bilateral - 2) = 1	Photophobia (no - 0, yes - 1) = 1	Tinnitus (no - 0, yes - 1) = 0	Bilateral Paresthesia (no - 0, yes - 1) = 0
Character (none - 0, throbbing - 1, constant - 2) = 1	Visual Symptoms (no - 0, yes - 1) = 1	Hypoacusis (no - 0, yes - 1) = 0	Family history = 0
Intensity (none - 0, mild - 1, medium - 2, severe - 3) = 3	Sensory Symptoms (no - 0, yes - 1) = 1	Diplopia (no - 0, yes - 1) = 0	**Type = Sporadic hemiplegic migraine** Random forest precision: 100% Random forest accuracy: 99.25%
Nausea (no - 0, yes - 1) = 0	Dysphasia (no - 0, yes - 1) = 0	Bilateral Visual Defects (no - 0, yes - 1) = 1	

Table 1. Patient's migraine characteristics inputted into the Random Forest algorithm

Discussion

When the patient experienced the symptoms of a migraine for the first time at ten years old, they were given the diagnosis of a migraine. However, the symptoms of blind spots and hemiplegia were indicative of a specific type of migraine: sporadic hemiplegic migraine. This diagnosis, however, was not first given by any of the healthcare professionals the patient had visited. When the characteristics of the patient's migraine were input into the random forest algorithm, it gave the diagnosis of sporadic hemiplegic migraine. After 13 years, an answer was finally provided.

Conclusion

Machine learning tools should be utilized by healthcare professionals when making diagnoses. Physicians should use these tools to aid them in their differential diagnoses to make the diagnostic process more efficient for everyone involved.

References

1. Migraine. National Institute of Neurological Disorders and Stroke. https://www.ninds.nih.gov/health-information/disorders/migraine.
2. Hemiplegic Migraine. Cleveland Clinic. https://my.clevelandclinic.org/health/diseases/hemiplegic-migraine.
3. Ho, T. K. (1998). The Random Subspace Method for Constructing Decision Forests. IEEE Transactions on Pattern Analysis and Machine Intelligence, 20(8), 832–844. https://doi.org/10.1109/34.709601
4. Classification. IHS Classification ICHD-3. https://ichd-3.org/classification-outline/.

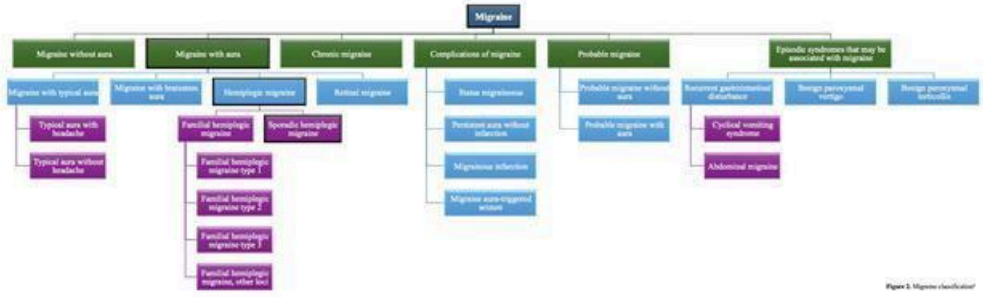


Figure 2. Migraine classification[4]

20

Synaptic Plasticity Alterations in the Infralimbic Cortex Following Cocaine Self-Administration

Mansi Madaik[1], Lily Vu[1], Christopher Driskill[1], Laney Waydick[1], Zarin Hasan[1], Mackenzi Dodd[1], Sven Kroener[1]
[1]The University of Texas at Dallas

Biography: *Mansi Madaik is a junior Biology major and Psychology minor at the University of Texas at Dallas. She works as an undergraduate research assistant under Dr. Kroener's Cellular and Synaptic Plasticity Lab, where she studies the neural mechanisms underlying cocaine addiction and vagus nerve stimulation (VNS) treatment. In the future, she hopes to attend medical school and become a physician.*

Abstract

Background: Cocaine use disorder involves the inability to control cocaine use despite harmful consequences, leading to dysregulation of prefrontal cortex circuits. The infralimbic cortex (IL), a subregion of the prefrontal cortex, plays a role in suppressing drug-seeking behavior through its connections to the nucleus accumbens shell (NAcShell). While prior studies have shown that cocaine self-administration affects synaptic plasticity in the prelimbic cortex (PL) to nucleus accumbens core (NAcCore) pathway, which drives drug-seeking behavior, it remains unclear how the IL to NAcShell pathway is impacted. This project investigates how cocaine self-administration alters dendritic spines in the IL to NAcShell pathway, focusing on spine head diameter and density.

Methods: Rats received retrograde adeno-associated virus (AAV) infusions in the NAcShell to induce GFP and Cre protein expression and Cre-dependent FLAG protein in the IL, labeling the IL to NAcShell pathway. After catheter implantation in the jugular vein, rats underwent two weeks of cocaine self-administration in operant chambers with light and tone cues paired to lever presses. A yoked-saline control group received saline infusions linked to cocaine-lever presses of paired rats. Brain slices were then collected and stained to label dendritic spines, GluA1 subunits, and cFos protein. Confocal microscopy and Imaris software were used to generate 3D models of dendrites and analyze spine morphology.

Results: Cocaine exposure was associated with a leftward shift in cumulative spine head diameter and a decreased trend in average spine head diameter, suggesting reduced synaptic strength and stability. Smaller spines, linked to immature or weaker synapses, may reflect disrupted synaptic plasticity in the IL to NAcShell pathway. This impairment could weaken the brain’s ability to suppress drug-seeking behavior by disrupting extinction-related signaling from the IL to the NAcShell.

Conclusion: These results provide insight into how cocaine impairs the IL to NAcShell pathway, weakening the brain's ability to suppress drug-seeking behavior. These findings lay the groundwork for exploring treatments like vagus nerve stimulation (VNS), which may reverse cocaine-induced changes in this pathway and help reduce drug-seeking behavior.

Inspiration: Substance use disorder is a pervasive, complex issue affecting individuals, families, and communities worldwide, presenting an urgent need for innovative research and treatment approaches. Exploring how cocaine disrupts neural mechanisms offers valuable insights into the biological basis of substance use disorders and informs potential therapeutic interventions like vagus nerve stimulation (VNS). Ultimately, this work aims to contribute to the future of medicine by advancing our understanding of substance use disorders.

Basic and Translational Science Projects

9

3D Modeling for the Production of a Biosafety Level 2 Facility

Princesa Gonzalez[1]
[1]Regis College

Biography: *Third-Year Biology Pre-Med Student at Regis College | Skilled in Laboratory Operations Management | Passionate About Advancing Lab Techniques.*

Abstract

Background: This project addresses the feasibility for designing and building a safe, efficient, and regulatory-compliant Biosafety Level 2 (BSL2) laboratory space for researching moderate-risk biological agents. The primary challenge here, was ensuring that the overall lab design meets state grant budgetary requirements as well as federal, state, and town chemical and biological safety standards while optimizing functionality and workflow.

Methods: This project involved using 3D modeling software (Westlab Spaces 3D Laboratory Model & Planning software) to design a BSL2 laboratory at my university. The design process incorporated comprehensive biological risk assessments, ergonomic considerations, and compliance with OSHA standards and local ordinances. The primary focal points surrounded the laboratory's spatial arrangement, equipment placement, and operational workflow, particularly airflow and biosafety equipment placement. We also identified potential design flaws prior to construction.

Results: The design model successfully depicted a fully functional BSL2 laboratory incorporating robust risk mitigation strategies and regulatory standards. Preliminary feedback from an expert review panel indicated that the layout maximized both safety and efficiency, with optimized airflow systems clearly identified. The project is ongoing, with data collection expected to conclude by summer 2025 upon project completion. Early findings suggest that utilizing the 3D model significantly reduces design flaws and enhances laboratory safety prior to construction.

Conclusions: The project demonstrated the importance of integrating 3D modeling into laboratory design to minimize risks and ensure safety. The results highlight how this approach improves the efficiency and functionality of BSL2 laboratories while guaranteeing compliance with regulatory safety standards. This method has potential applications for future lab planning and construction, advancing biosafety protocols in research environments.

Inspiration: My passion for this project was driven by my interest in biosafety and my desire to enhance protection measures in scientific research settings. Recognizing the dangers posed by pathogenic biological agents emphasized the critical importance of effective biosafety planning. By improving laboratory safety designs, I aim to contribute to safer research environments, supporting innovative scientific advances and ultimately protecting public health through enhanced laboratory practices.

Basic and Translational Science Projects

Poster Snapshot

3D Modeling for the Production of a Biosafety Level 2 Facility

Princesa Gonzalez[1], Shannon Hogan[1]

[1]Regis College, Watson-Hubbard Science Center, 235 Wellesley St., Weston, Ma, 02493

Abstract

Planning and designing a BSL-2 laboratory gave me a unique opportunity to utilize my substantial understanding of laboratory operations and biosafety in a real-world situation. The project required extensive planning, integration of safety standards, and regulatory compliance, all while enhancing the space's functionality. Advanced design software was important in visualizing the plan and identifying solutions to space limits, enabling for the installation of critical equipment and safety measures. Every part of the design has to strike a balance between the strict safety regulations required for handling biological materials and the practical requirements of a dynamic research environment. The resulting lab will be a cutting-edge resource for both advanced biological research and hands-on student training, preparing the next generation of scientists. This experience not only broadened my understanding of laboratory design, but also demonstrated the significance of seamless integration of safety, efficiency, and creativity. Finally, this effort has helped to create a space that encourages both academic progress and advanced research in the biological sciences, ensuring that it will be a valuable resource for many years to come.

Introduction

Biosafety Level 2 (BSL2) laboratories are specialized facilities designed for research involving moderate-risk biological agents that pose a potential hazard to human health but are not typically airborne. BSL2 laboratories are required to follow strict safety protocols to prevent exposure to biological materials that can cause infections through ingestion, inhalation, or skin contact.

The addition of a BSL2 laboratory at Regis College offers significant benefits to both the institution and its STEM community. This facility will provide faculty with a secure and controlled environment to conduct research on moderate-risk biological agents, advancing studies in microbiology, molecular biology, and biotechnology. While only trained faculty members will be authorized to work within the BSL2 lab, it will serve as a critical resource for enhancing research opportunities and fostering collaborations within other schools in the area. The facility will also strengthen Regis College's ability to attract research funding, creating potential for external partnerships, and better prepare students for careers in the medical field through second-hand experience.

While working on a laboratory portion of my Laboratory Operations Management (LOM) course, I was given the unique opportunity to contribute to this project by leading the planning and designing this Biosafety Level 2 Facility utilizing 3D modeling software. As an undergraduate student, I felt prepared to take on this role since I had a solid basis in laboratory operations and biosafety from earlier courses and mentoring. This project not only allowed me to use what I had learned, but it also allowed me to combine design principles and biosafety laws to develop a functional, safe, and efficient laboratory layout.

Materials and Methods

Westlab Spaces 3D Laboratory Model & Planning Software

This software was used to design and model the layout of the Biosafety Level 2 laboratory. It enabled exact spatial planning and equipment placement.

Results

The design model of the BSL2 laboratory has been a crucial component in demonstrating how to integrate both safety and operational efficiency into a high-risk environment. By leveraging advanced digital modeling tools, the project has provided a comprehensive visual representation of the laboratory's layout, systems, and workflows, ensuring that all potential hazards are anticipated and mitigated before physical construction begins. The design takes into account essential risk mitigation strategies such as proper containment measures, waste management, and clear labeling for hazardous areas, all which are integral to maintaining a safe compliant laboratory.

The feedback on this project has been overwhelmingly positive, especially with regard to the laboratory's layout, which has been optimized to ensure smooth workflow and minimize the risk of accidental exposure or contamination. The strategic placement of equipment and workstations has maximized both safety and efficiency, facilitating effective movement and interaction between laboratory staff while ensuring adherence to safety guidelines.

Figure 1. A, B, C
Different perspectives of the room. A. Left side of the room. B. Center view of the room. C. Right side of the room.

Figure 2. A, B, C
Different perspectives of the 3D Model. A. Left side of the design. B. Center view of the design. C. Right side of the design.

Discussion

Regis College's Biosafety Level 2 (BSL-2) laboratory was designed and planned using a rigorous and iterative approach that included regulatory research, equipment analysis, and spatial optimization. The research began with a thorough assessment of key biosafety requirements, such as OSHA laws, CDC protocols, and municipal safety standards. This foundational research established that the design followed all necessary safety precautions for handling moderate-risk biological agents, with a focus on both compliance and lab staff safety. With these laws in mind, I then reviewed the technical specifications and measurements of the necessary laboratory equipment, assuring optimal selection and placement to maximize workflow and reduce potential dangers.

The following step was integrating the BSL-2 lab into the existing space, taking into account air flow, lab access points, and safety zones. This necessitated a careful balance between utility and safety, ensuring that the laboratory could run effectively while maintaining safety and regulatory standards. Using 3D modeling software, I was able to digitally simulate the lab layout, allowing for several adjustments before to construction. This technique helped to optimize the spatial design, ensure that equipment was strategically located, and anticipate any concerns that could develop during the construction phase. The ability to tweak the design in a virtual environment facilitated a smoother transition from planning to implementation.

This project provided an excellent opportunity to use my expertise of laboratory operations and biosafety in a real-world setting. The integration of safety requirements with actual research objectives caused difficulties, particularly in reconciling space limits with the required equipment and safety measures. Collaboration with academics and staff, as well as the use of advanced design software, allowed me to contribute to a safe, efficient, and regulatory-compliant BSL-2 lab that will serve as a crucial resource for both research and student preparation in biological sciences.

References

REGIS
A CATHOLIC UNIVERSITY IN GREATER BOSTON

COMMUNITY
DEVELOPMENT
AND
SERVICE PROJECTS

25

Steps Towards Healing: Bringing Wound Care Treatment to the Skid Row Population

Kathleen Kilroe[1], Dr. Mary Marfisee[1]
[1]University of California, Los Angeles, David Geffen School of Medicine

Biography: *Kathleen Kilroe is a third year medical student at the University of California Los Angeles David Geffen School of Medicine. As a part of her third-year studies, she is a part of the Health Justice & Advocacy curriculum under which she has launched a community care project focusing on providing wound care to the unhoused in Skid Row. She is dedicated to addressing healthcare disparities, particularly within underserved populations. Her commitment to working with the unhoused predates her medical school journey and she is excited to share her experiences using medicine to advocate for vulnerable populations.*

Abstract

Background: Unhoused individuals face increased risk of acute and chronic wounds due to limited care access, poor hygiene, and environmental stressors. Skid Row, a major homeless hub in Los Angeles, has a critical need for wound care that current systems do not meet. This study aims to explore wound care needs on Skid Row to better serve this vulnerable population.

Methods: The DGSOM Student Run Homeless Clinic, partnered with Union Rescue Mission, conducts weekly street medicine clinics in Skid Row. To identify best practices for launching a community-based wound care clinic, we administered cross-sectional surveys to consenting patients. For each patient, we collected data on wound type, current care regimen, wound etiology, and barriers to care. Healthcare providers documented the supplies used to determine the minimum necessary resources for care.

Results: We found that 41% (54/131) of triaged medical concerns were wound-related, with 66% of wound care patients being male (average age: 40.3) and 34% female (average age: 42.3). Chronic wounds (59%) were more prevalent than acute wounds (41%), with common chronic wound etiologies being traumatic (22%) and injection wounds (15%). Common acute wound causes include lacerations (27%), abrasions (22%), and penetrating wounds (13%). Barriers to care included self-management or delaying care (32%), lack of transportation/supplies (17%), fear of hospitals or law enforcement (15%), and responsibilities preventing care access (15%). Most patients used tap water and cloth/plastic covers for wound care, and 76% felt they could self-care if provided with supplies. The most used supplies were gloves, tape, gauze pads/rolls, soap, bacitracin, and adhesive bandages.

Conclusion: We have demonstrated a clear need for wound care in the Skid Row community and highlighted the importance of outreach due to barriers to care and a ‘wait and watch’ approach. Our findings also demonstrate that street medicine wound care can be effectively provided with minimal supplies.

Inspiration: My dedication to wound care for the unhoused stemmed from witnessing the significant health disparities this community faces. Walking through Skid Row, I saw many untreated wounds due to limited care access and fear of pursuing care largely due to stigma, often leading to infection and complications. I wanted to address this critical gap, improve their health outcomes, and help bridge the accessibility divide by bringing wound care to those who need it most. This directly aligns with my goal to serve not only as a physician, but truly an advocate for the underserved.

Community Development and Service Projects

Poster Snapshot

Steps Towards Healing: Bringing Wound Care Treatment to the Skid Row Population

Kathleen Kilroe[1], Maggie Owens[1], Rebbecca Barnes[1], Mary Marfisee[2], MD, MPH

[1]David Geffen School of Medicine at UCLA, [2]Department of Family Medicine

Introduction

Skid Row, a neighborhood located in Downtown Los Angeles, serves as a concentration of homelessness and poverty, with over 4,000 unhoused individuals, most of whom live on the streets.[1] Union Rescue Mission, open since 1891, is a faith-based organization on Skid Row that provides low-barrier emergency and transitional shelter to persons experiencing homelessness. The UCLA Student-Run Homeless Clinic (SRHC), in partnership with URM, offers cost-free healthcare services. SRHC operates a street medicine clinic in which medical students, under attending supervision, walk directly through Skid Row alongside URM chaplains with outreach ministry and housing services. Unhoused individuals are at increased risk for acute and chronic wounds due to limited access to care, inadequate nutrition, poor hygiene, and exposure to environmental stressors. Wounds are often left untreated leading to infection and further complications.[2,3] Wound care represents a critical need in the Skid Row community that current safety-net systems struggle to meet.

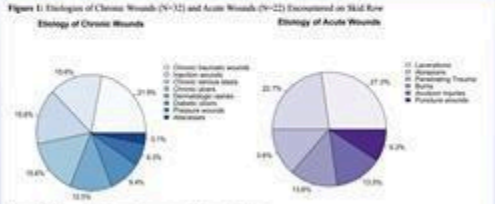
Objective

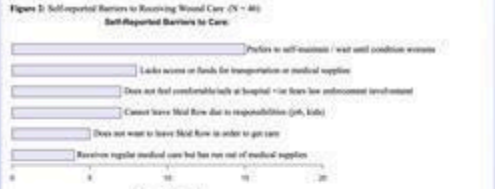
To evaluate the overall need for wound care services and wound characteristics in the Skid Row population. Additionally, to assess the barriers to wound care access and logistically, what resources are needed to effectively operate a street-based, direct-outreach wound care intervention.

Methods

Data was collected during weekly street medicine clinics, ranging from 1-4 hours. To identify best practices for launching a street-based wound care clinic, we administered mixed-methods surveys to consenting patients. For each patient, we collected data on wound type, current care regimen, wound etiology, and barriers to care. Healthcare providers documented the exact supplies used to determine the minimum necessary resources for care.

Results





"I wash it in the community showers when I can, usually three times a week, and then cover it with a bandana or plastic bag the rest of the time".

"If I can afford to get OTC antibiotic I will, but I mostly save the money for other things".

"I put hand sanitizer on the scratches to disinfect them, it killed the wound but also my skin".

Results

- Since the initiation of Skid Row Street Medicine Clinic in 2023, approximately **700** patients have been served, 131 of whom were evaluated for inclusion in this study.
- We found that **41**% (54/131) of all triaged medical concerns were wound-related, with 66% of wound care patients being male (average age: 40.3) and 34% female (average age: 42.3)
- Chronic wounds (**59**%) were more prevalent than acute wounds (**41**%) - common etiologies displayed in Figure 1.
- **76**% (35/46) of patients felt capable of self-managing wounds if provided with supplies.

Conclusions

- **High need for wound care**: our results indicate that wound care represents a significant medical need (41% of all triaged medical needs) in Skid Row and is currently not well-managed.
- **Prevalence of chronic wounds**: higher rate of chronic vs. acute wounds, most commonly due to poor-healing traumatic wounds, injection wounds, and non-healing ulcers - highlighting the importance of early intervention in acute wound care.
- **Importance of outreach**: the majority of patients endorsed preferring to self-manage their wounds & a high confidence level in self-care if access to supplies was available. This highlights the importance of direct outreach care and education
- **Minimum of supplies:** very little supplies is needed for most street wounds (Figure 3), but close follow-up is key.

References

1. Los Angeles Homeless Services Authority. Greater Los Angeles Homeless Count Data. Available at: https://www.lahsa.org/news?article=879-2024-greater-los-angeles-homeless-count-data
2. Goto T, Wang C, Kanai C, Nguyen C, Salgari LN. Community-Based Wound Care Programs for Unhoused Individuals. J Epidemiol Glob Health. 2023 Dec;13(4):804-814. doi: 10.1007/s44197-023-00137-6. Epub 2023 Oct 17. PMID: 37847466; PMCID: PMC10686911.
3. Thorndike AL, Yeimyo HE, Thorndike MA, Jeffrys M, Rowe M. Unmet health needs and barriers to health care among people experiencing homelessness in San Francisco's Mission District: a qualitative study. BMC Public Health. 2022;22(1). doi:https://doi.org/10.1186/s12889-022-13499-w

Acknowledgements

Thank you to all members of the URM staff and chaplains who significantly enhance the care that we provide and helped make this project possible.

113

Quantifying Patient Savings: The Economic Impact of Willow Clinic's Services

Zane Haidar[1], **Claire Lin**[1], **Taylor Schwarz**[1], **Marco DelFava**[3], Dr. Kate Richards[2], Dr. Kirti Malhotra[2]
[1]University of California, Davis, [2]UC Davis Medical Center, [3]First Step Communities

Biography: *Zane Haidar is a fourth-year UC Davis student and aspiring physician dedicated to community-driven healthcare. As the co-manager of the Willow Clinic, Zane focuses on enhancing healthcare accessibility, patient-centered care, and advocacy efforts. Additionally, Zane conducts research in organic and fluorine chemistry, contributing to scientific advancements. He is passionate about healthcare education and empowering communities with the knowledge and resources to support their well-being, values he aims to carry forward into his future medical career. Claire Lin is a co-manager of the Willow Clinic, a student-run free clinic serving the unhoused population in Sacramento, California. A 2024 alumni of UC Davis, she earned a degree in Neurobiology, Physiology, and Behavior with a minor in Public Health. She will begin nursing school in the fall and aims to continue addressing health inequities. In her free time, she enjoys crafting and trying new recipes. Taylor Schwarz is a fourth year at the University of California, Davis majoring in Neurobiology, Physiology, and Behavior. She is interested in pursuing a career in medicine, as a physician. Taylor has been a part of the student-run Willow Clinic for three years, beginning as a general volunteer and now serving as the Co-Manager. She is passionate about health equity, creating a space for all communities to be cared for within healthcare. Marco DelFava serves as the Operations Specialist at First Step Communities, supporting four low barrier shelters in Sacramento, California. These programs are committed to increasing access to medical and psychiatric care, as these services are correlated with improved health and housing outcomes.*

Abstract

Background: Every Saturday, our student-run clinic provides essential healthcare services at a homeless shelter, including physical health check-ups, behavioral health treatment, and medication refills. To assess our broader impact on the healthcare system, we will analyze the cost savings associated with reduced emergency room visits and medical treatments due to our early intervention and free healthcare services. This analysis will help us identify new opportunities to enhance both our financial efficiency and the quality of care we provide to our patients.

Methods: Our project involves a retrospective review of 210 patients seen at a student-run clinic that operates every Saturday inside a homeless shelter in Sacramento. Serving the unhoused population, we analyze every patient record in our Practice Fusion EHR from June 2023 onward to estimate the cost savings generated by the clinic. Specifically, we seek to quantify the financial impact of diverting emergency room visits and providing early interventions free of charge. Each patient visit is assigned a procedure code to approximate billing costs for medical procedures, medications, and supplies provided in hopes of assessing the clinic's role in reducing overall healthcare expenditures.

Results: Our project aims to quantify the total medical cost savings provided to patients through our clinic's services. Preliminary data analysis suggests significant reductions in out-of-pocket expenses, particularly for uninsured and underinsured individuals. Data collection is ongoing and is expected to be completed by April 19, 2025. These findings will provide valuable insight into the financial impact of our clinic's efforts.

Conclusion: Our analysis demonstrates that free preventive care significantly reduces healthcare costs by preventing emergency visits and improving access to early treatment. These findings highlight the value of community-based healthcare in reducing financial burdens on both patients and the healthcare system. Continued data collection will further clarify the long-term impact and support efforts to expand cost-effective care solutions.

Inspiration: Witnessing health inequities among the unhoused, we sought to explore how community clinics bridge healthcare gaps. Committed to preventive care, we believe timely interventions improve outcomes. Our work quantifies the financial impact of our services, emphasizing cost savings and accessibility. These findings advocate for policies that sustain and expand community clinics, promoting equitable healthcare.

Community Development and Service Projects

22

A Decade-Long Impact of the Mid Central Area Health Education Center Health Careers Pipeline Program on Students Pursuing Healthcare Careers in Rural & Underserved Michigan

Adam Gaetz[1,2,3], Husna Hussaini[1,2], Grace Lehto[1,2]
[1]Central Michigan University College of Medicine, [2]Mid Central Area Health Education Center, [3]American Medical Student Association

Biography: *As a medical student at Central Michigan University College of Medicine, Adam engages in pursuits that compliment his desire to serve the medically underserved, driven by a profound desire to improve healthcare access in underserved communities. He actively advocates for equitable healthcare policies, coordinates and executes various national initiatives to benefit those in need, and fosters collaborative environments among future healthcare providers. Adam's history with the American Medical Student Association started in 2019, serving as President of his college's AMSA chapter for three years, then as Presidential Advisor until departing for medical school. In 2024, he became AMSA's National Chair of Medical Education, pursuing various national initiatives including launching an annual "MedEd Scorecard", which undertakes a multi-faceted assessment of 200 MD and DO programs in the United States, developing an annual report of suggested program adaptations provided to all US medical schools. He also pursues initiatives to transform the AAMC Fee Assistance Program and application process for socioeconomically disadvantaged medical school applicants, is helping design and facilitate various Future Physicians for Change Advocacy Workshops, is expanding awareness of reproductive health educational opportunities through AMSA's Repro Project, and helped build upon AMSA's Family & Friend Initiative. Adam is currently in the process of establishing an AMSA chapter at his medical school and hopes to continue growing AMSA's reach at the national level. Within his medical school, Adam holds various leadership roles, serving as a Facilitator in the Mid Central Area Health Education Center's Health Careers Pipeline Program, as the Mt. Pleasant Event Coordinator for CMU Street Medicine, as Co-President of the Neurosurgery Student Focus Group, and as the Coordinator and Facilitator of various clinical workshops for CMU's Annual Sibs & Kids Weekend, for his medical school's summer camp program CampMed, and for his university's summer camp program Grandparents University.*

Abstract

Background: Over the last ten years, the Mid Central Area Health Education Center (AHEC) has hosted a Health Careers Pipeline Program (HCPP) that has seen hundreds of high school, undergraduate, and medical students graduate from the program. The program not only highlights the career paths available to students, but also gives them hands-on clinical skills experiences, all while highlighting the need for providers in the rural and underserved communities of Michigan. The feedback obtained from these attendees shows an overwhelming positive impact on their plans to enter a healthcare career following the program.

Methods: The HCPP is open to any interested high school, undergraduate, and medical students. Applications open in the fall and spots are filled following the closure of the application deadline. Surveys from all participants are completed at the conclusion of each session over ten weeks, allowing for data to be aggregated to allow facilitators to measure the impact of the program and identify areas for improvement.

Results: To highlight the adaptive nature of the program, in the last five years, including pre-pandemic, pandemic, and post-pandemic program satisfaction numbers, the program satisfaction averages were lowest at 92.6% overall satisfaction among attendees and highest at 97.2% overall satisfaction among attendees. Results over this same time period highlight both quantitative and qualitative feedback, all of which is overwhelmingly positive, highlighting the positive impact on attendees, their willingness to pursue a healthcare career in rural or underserved Michigan, as well as constructive feedback that allows the program to continue to improve.

Conclusions: Michigan is in need of providers that serve its rural and underserved populations. The AHEC's HCPP selects interested students, engaging them in a pipeline program that historically sees attendees graduate with overwhelmingly positive experiences that result in their intent to pursue a healthcare career within rural and underserved Michigan communities.

Inspiration: Having been raised in poverty and having lived through homelessness within an underserved and underrepresented community as a child and an adult, being chosen to serve as a facilitator within a pipeline program that helps inspire students to pursue a healthcare career in medically underserved communities has been an honor. I will continue serving within this program every fall throughout my medical school journey, hoping to inspire and motivate as many future practitioners as possible to practice medicine within these communities. Programs like these are the foundation of progress to address the health disparities in the US.

Community Development and Service Projects

Poster Snapshot

COLLEGE OF MEDICINE
CENTRAL MICHIGAN UNIVERSITY

A Decade-Long Impact of the Mid Central Area Health Education Center Health Careers Pipeline Program on Students Pursuing Healthcare Careers in Rural & Underserved Michigan

Adam Gaetz, Husna Hussaini, Grace Lehto

Mid Central Area Health Education Center
800 E Preston St | Fowl 010
Mt Pleasant, MI 48858

AHEC
MID-CENTRAL REGIONAL CENTER
MICHIGAN AREA HEALTH EDUCATION CENTER

Area Health Education Center (AHEC)

The Mid Central AHEC is a program dedicated to recruiting, training and retaining the healthcare workforce committed to serving rural and underserved populations in Michigan. It serves 19 counties including Isabella, Saginaw, and Midland. Their academic host partner is Central Michigan University College of Medicine, with campuses in Mt. Pleasant and Saginaw, serving as sites where the Health Careers Pipeline Program (HCPP) is hosted. The Mid Central AHEC Regional Center is staffed by April Osburn, Executive Director, and Jennifer Morneau-Wilson, Program Manager. The HCPP provides students an opportunity to explore health careers while helping the CMU College of Medicine's outreach efforts to recruit and maintain more health professionals dedicated to providing healthcare in rural and underserved Michigan. The Mid Central AHEC is funded in-part through a federal Health Resources and Services Administration grant program managed by Wayne State University and the CMU College of Medicine.

The Mid Central AHEC prides itself in fulfilling 3 missions:

1. Creating "pipeline" programs for high school students to be encouraged to pursue careers in health professions.
2. Facilitating housing for medical student's rotations across the state of Michigan to improve healthcare distribution.
3. Identifying new educational program partners for practicing healthcare professionals.

Program Overview

The 2024 HCPP schedule was as follows:

- 9/30/24: HCPP Overview & Leadership Panel
- 10/7/24: Career Night (Interprofessional)
- 10/14/24: Simulation Lab
- 10/21/24: Emergency Preparedness
- 10/28/24: Career Night (Exploration)
- 11/4/24: Primary Care Skills
- 11/11/24: Athletic Training & Audiology
- 11/18/24: IVs & Public Health Initiatives
- 11/25/24: Graduation Ceremony
- 12/3/24: Administrative Program Recap & Wrap

Students also complete a Personal Growth Project highlighting what they learned about seven key traits essential for healthcare professionals. They select one trait, connect it to a healthcare career of interest, and present their insights on how the two are related.

Health Careers Pipeline Program (HCPP) Methodology

For ten years, the HCPP aligned with AHEC's mission, has introduced 9th and 10th-grade high school students to health careers and clinical experiences to inspire interest in health-focused professions. Over nine weeks, the HCPP convenes weekly for individual two-hour sessions where medical students, undergraduate mentors, and high school mentees explore different health careers through hands-on clinical activities. To assess mentee satisfaction and their intent to pursue a healthcare career, participants complete a survey following each session.

Recruitment

Undergraduate mentors for the HCPP are recruited from CMU's Pre-Medicine fraternity and other student organizations, targeting first-generation college students and future healthcare workers. First generation high schoolers from medically underserved communities that are interested in health careers are recruited from area schools to further their pathway knowledge.

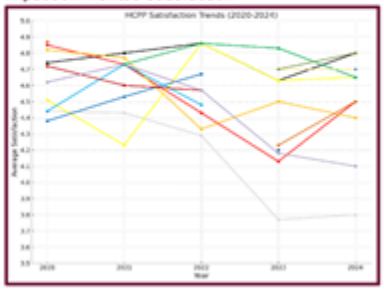
Medical Student Facilitators

Medical students from CMU College of Medicine serve as leaders and facilitators of the HCPP upon being selected through an application process by Mid Central AHEC staff based on their alignment with the program's mission. Medical student facilitators are responsible for serving as primary mentors to both the undergraduate and high school students. Medical students , alongside Mid Central AHEC staff, create and lead weekly sessions while collaborating with CMU College of Medicine and the College of Health Professions, working with students and faculty to construct innovative learning opportunities for high school students.

Program Impact

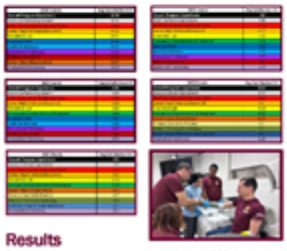
This project serves as a formal evaluation tool and promotional resource for the Mid Central AHEC. It provides detailed insights into the program's long-term effectiveness, which can be utilized in grant applications, public presentations, and internal reviews. By documenting both quantitative and qualitative outcomes, the project offers clear evidence of how the HCPP has improved students' academic trajectories and career aspirations in the health field. Additionally, this project helps the organization identify areas of growth while supporting efforts to replicate the program in other rural and underserved communities, ensuring broader access to similar career pipeline initiatives to more students.

Impact on Mentee Satisfaction



Impact on Mentee Perceptions

Trends of satisfaction of HCPP mentees over a 5-year period (2020-2024).

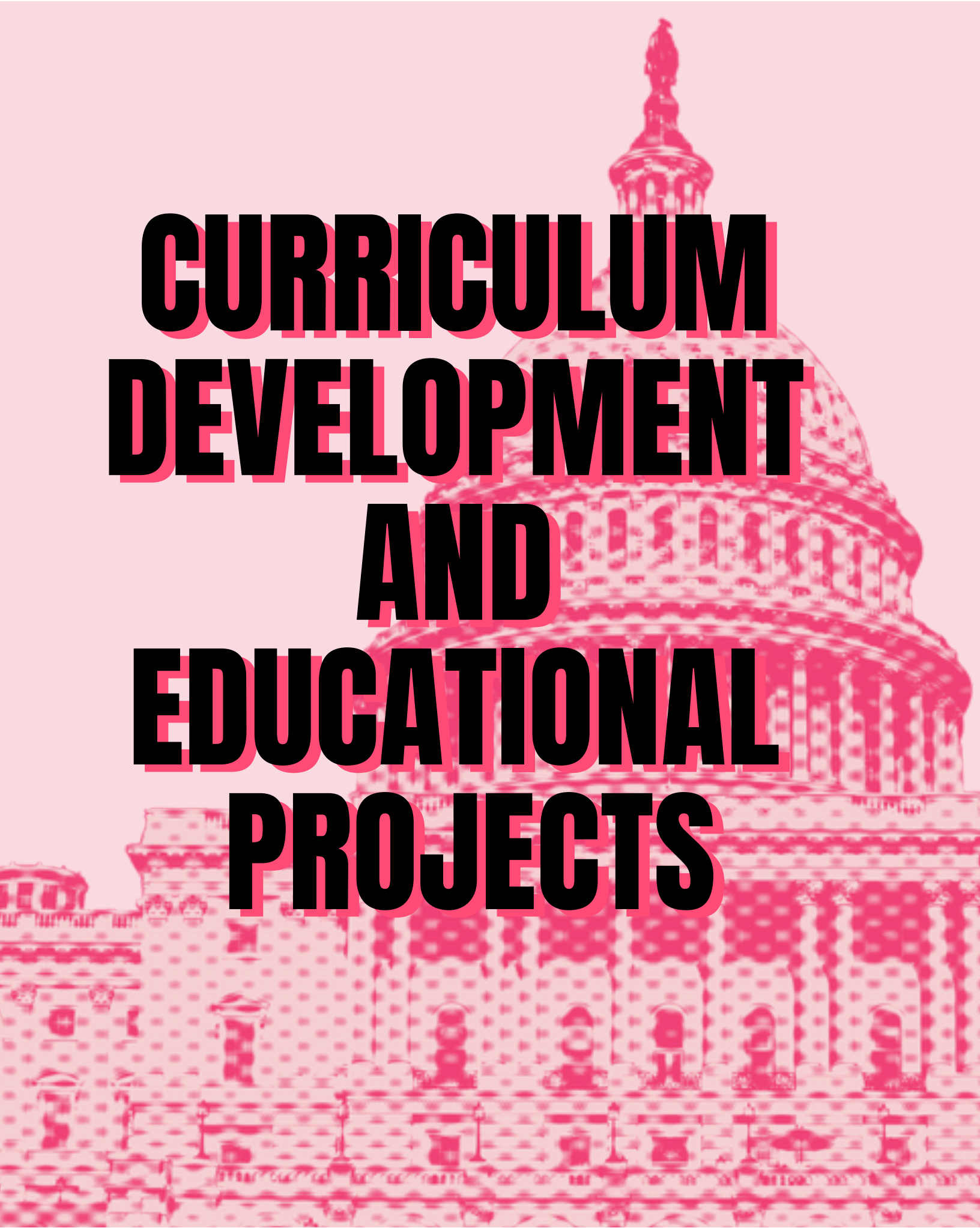


Results

To highlight the adaptive nature of the HCPP in the last five years, including pre-pandemic, pandemic, and post-pandemic program satisfaction numbers, the overall program satisfaction averages were the lowest at 92.6% and highest at 97.2%. One can observe satisfaction with virtual modalities peak during the pandemic and fall post-pandemic in the tables above. Qualitative feedback obtained over this same period highlights the positive impact of the HCPP on attendee's desire to pursue health careers in rural or underserved Michigan (see binder containing feedback from participants). These qualitative measures paired with quantitative measures allow the HCPP to continue improving its structure for the future.

Conclusions

The Mid Central AHEC provides a vital community resource by addressing health workforce shortages in rural and underserved areas of Michigan, engaging students in experiences that nurture their interests in a health career while highlighting the need for providers in underserved areas. Through the HCPP, the organization offers mentorship, health career education, and professional development opportunities. This proactive investment in the community improves the long-term health and well-being of rural and underserved populations by increasing the number of culturally competent healthcare providers who understand their vital roles in serving these communities.



CURRICULUM DEVELOPMENT AND EDUCATIONAL PROJECTS

26

The Lifetime Impact of Incarceration on Women's Health

Ms. Morgan Motakef, **Likhita Nandigam**[1], **Ms. Divya Popat**, Mr. Adith Ram, Ms. Abigail Rex, Mr. Marc Robinson
[1]Baylor COM

Biography: *Morgan is a third-year medical student at Baylor College of Medicine. She is passionate about health equity and working with underserved populations, specifically, the currently and formerly incarcerated. She understands the repercussions of barriers to care for mental health and is excited to pursue a career in psychiatry.*

Abstract

Background: The United States has the largest prison population worldwide, yet healthcare access in prison is limited and of sub-standard quality. Women in jail or prison were twice as likely to be overdue for breast cancer screening and five times more likely to be overdue for a cervical cancer screening compared to the general population. It is well documented that even after serving time in jail or prison, incarceration history remains an independent barrier to care. There is a clear need for increased delivery of quality healthcare to currently and previously incarcerated populations.

Methods: We created a needs assessment to understand how incarceration impacts access to breast and cervical cancer screening care. With ethical considerations in mind, we sampled previously incarcerated women with access to adequate resources at re-entry or transition homes in Houston. Participants compared their access to care before, during, and after incarceration, addressing barriers and their perceptions of recommended cancer screening frequencies.

Results: 23 women completed the needs assessment. Most were Caucasian (64%) or Black (23%) with a mean age range of 30-39. Most believed both breast cancer and cervical cancer screenings should be conducted annually. Despite this, one-third of women had one or fewer women's health visits unrelated to pregnancy in their lifetime and over half of women (62.5%) did not receive any breast or cervical cancer screening while incarcerated. Before incarceration, women cited a lack of knowledge (30%), finances (45%), or transportation (25%) as barriers. During incarceration, scheduling (35%), discrimination (25%), and distrust in providers (10%) played a unique and significant role. After incarceration, most women continued to struggle with a lack of finances (32%) or transportation (32%).

Conclusion: Our findings highlight the lifelong limitations to accessing women's healthcare and the unique barriers while in jail or prison. Incarceration breaks down much of the fundamental trust between physicians and patients. This study highlights the need to improve access to preventive care services and rebuild the physician-patient relationship for currently and previously incarcerated women.

Inspiration: Through our work teaching health education classes at the Harris County Jail and managing pregnancies for previously incarcerated women with substance use disorders at the county hospital, we have witnessed the lasting mental and physical health impacts of incarceration. Motivated by these experiences, we sought to quantify access to preventive healthcare for previously incarcerated women. Future interventions should address barriers to care and empower women to seek screening care.

Curriculum Development and Service Projects

116

Radiology-Enhanced Anatomy Education: A Novel PILOT Approach at Wright State Boonshoft School of Medicine

James Dai[1], Betsy Gauthier[1], Garrett Fischer[1], Anuradha Haridhas[1], Dr. Annelise Silva[1], Dr. Barbara Kraszpulska[1], Dr. Annie Rhee[2], Dr. Amar Shah[2], Dr. Harrison Lang[2], Dr. Parker Brown[2], **Aubrienne Silva**[3], Dr. Alvin Silva[1]
[1]Wright State University Boonshoft School of Medicine, [2]Mayo Clinic Arizona, [3]University of California at Los Angeles

Biography: *Aubrienne Silva (she/her) is a second-year undergraduate studying Human Biology and Society at the University of California, Los Angeles (UCLA). She is a part of her local AMSA chapter as the Community Service Committee head and also serves as the premedical coordinator for the Rising Physicians Pathway Committee of national AMSA. In her free time, she loves to sing, make hyperspecific Spotify playlists, and try new matcha/boba spots.*

Abstract

Background: The integration of radiology teaching into medical school curricula, particularly during anatomy education, has gained traction to enhance student learning and clinical preparedness. Despite its recognized value, medical students consistently express a desire for more comprehensive radiology education. Survey data from Wright State Boonshoft School of Medicine (BSOM) class of 2024-2027 showed 99% of the respondents indicated a need for more radiology education in the curriculum. This study aims to address this gap by incorporating daily radiology sessions into the Human Anatomy (HA) course at BSOM, evaluating its impact on students' anatomical understanding and image interpretation skills.

Methods:A quasi-experimental design will be implemented in the 2025-2026 academic year, involving first-year medical students. The intervention group will participate in daily 15-minute radiology sessions led by radiology residents or upper-class medical students, supervised by radiologists. These sessions will feature pre-recorded videos covering radiological images related to the day's anatomy material. Radiology images will be integrated into lab dissector guides, and post-lab surveys and quizzes will assess learning progress. The control group will attend the standard HA course without the radiology component. Data will be collected quantitatively through HA test scores and qualitatively through pre- and post-course surveys, comparing outcomes between the intervention and control groups.

Results: While results are pending, preliminary data from the radiology sessions offered by Radiology Interest Group across the classes of 2024-2027 at BSOM indicate that the sessions increased student engagement in radiology, increased student performance and confidence on imaging-based questions, and that there still needs to be more integration. This aligns with existing literature that consistently reports positive student perceptions, improved understanding of anatomical structures, higher anatomy exam scores, and enhanced clinical skills development following early exposure to radiological images.

Conclusion: This study aims to provide empirical evidence for the benefits of integrating radiology into anatomy education. By bridging the gap between theoretical knowledge and practical application, this approach aligns with modern educational strategies emphasizing experiential learning and contextual understanding. The findings have the potential to drive curricular reforms, establish a framework for seamlessly integrating radiology into anatomy education, and cultivate a more comprehensive and clinically relevant training approach for future physicians. Ultimately, this may lead to improved diagnostic accuracy, appropriate utilization of imaging modalities, and enhanced patient care.

Curriculum Development and Educational Projects

28

Artificial Intelligence in Medical Training: A Large Language Model-Based Standardized Patient Platform

Willis Tang[1], Aniket Pratapneni[1], Matthew Kim[1], Nabaan Mir[1], Paul McMillan Villalobos[1], Gavin Shu[1]
[1]University of California, San Francisco, SOM

Biography: *Willis Tang is a first-year medical student at the University of California, San Francisco (UCSF) with a strong background in biomedical research, healthcare innovation, and policy advocacy. He has led multiple research projects across institutions like the UCSF School of Medicine, Keck School of Medicine, and the National Institutes of Health, presenting his work at international conferences and contributing to peer-reviewed publications.*
Beyond research, Willis is committed to leveraging technology and policy to drive meaningful change in healthcare. He co-founded an AI-driven health education startup and serves as an analyst for UCSF Innovation Ventures, where he integrates his expertise in entrepreneurship, medicine, and digital health to explore novel solutions for improving patient care. As the Founder and CEO of the Everyday Responder Project, a 501(c)(3) nonprofit, he has worked to close critical gaps in emergency preparedness by providing cost-free bystander first-aid training and emergency equipment across five countries. Additionally, his community-driven initiatives and research have shaped his advocacy for equitable cancer policies at both the state and federal levels through the American Cancer Society, where he has contributed to efforts that expand access to life-saving screenings and treatments.

Abstract

Background: Many standardized patient programs are costly, resource-intensive, and lack diversity, restricting students' exposure to a wide range of clinical presentations. Additionally, access to quality training resources varies widely between institutions. This can lead to gaps in diagnostic preparedness and hinder the development of effective patient communication skills. Thus, we aimed to develop a scalable, AI-driven training tool that connects classroom learning to real-world patient care. Our vision is to ensure equitable access to immersive, modern clinical training that improves diagnostic accuracy and better prepares physicians for diverse patient populations.

Methods: This project utilizes an LLM-based natural language processing model to generate dynamic, medically accurate patient encounters based on user-specified keywords. A JSON database manages patient history, labs, and problem lists, while integrated feedback tools assess diagnostic accuracy and clinical decision-making. Preliminary testing with over 50 medical students and physicians evaluated user engagement, clinical reasoning, and communication skills. Future iterations will include voice interaction, multimodal clinical components (e.g., lung sounds), and SOAP note documentation practice to enrich learning outcomes.

Results: Early findings indicate strong engagement and positive feedback from users, with participants self-reporting improvements in their diagnostic reasoning and clinical communication through unstructured interviews. More specifically, users emphasized the platform's ability to generate nuanced, realistic patient interactions that surpass traditional case-based learning. Data collection remains ongoing, with efforts focused on expanding testing across a broader range of medical learners to evaluate performance and effectiveness.

Conclusion: Our results suggest that our LLM-based standardized patient platform has the potential to enhance medical training by providing immersive, adaptable clinical simulations. The platform's scalability, cost-effectiveness, and accessibility make it a viable solution for bridging gaps in medical education, positioning it for widespread adoption in clinical training. Continued development and evaluation will focus on refining scenario feedback mechanisms, integrating advanced clinical data, and optimizing the user experience.

Inspiration: Our team witnessed firsthand how disparities in standardized patient training created systemic inequities across institutions—some peers had frequent opportunities to refine their clinical skills, while others had limited access, resulting in stark differences in confidence and patient interaction abilities. Recognizing this gap, we sought to develop an AI-driven solution that ensures all learners, regardless of institutional resources, have access to high-quality patient encounters. By enhancing clinical reasoning, communication, and decision-making, this platform not only creates a more equitable training experience but also helps cultivate a healthcare workforce better equipped to deliver competent, patient-centered care.

Curriculum Development and Service Projects

29

Climate Change as a Threat Multiplier: The Case for Student Initiative in Medical Education

Annie Yu[1], **Robert Pritchard**
[1]Geisinger Commonwealth School of Medicine

Biography: *Annie Yu and Robert Pritchard are third year students at Geisinger Commonwealth School of Medicine (GCSOM) with a passion for climate health. In 2023, Annie and Robert conducted a narrative review on health systems' role in mitigating climate change, including medical provider education. They began working with Jennifer Koestler, MD, associate dean for medical education, and Amanda Caleb, PhD, professor of medical humanities, to focus on the education piece. They developed a lecture on climate health and environmental justice, and are investigating medical students' understanding of climate health. Additionally, Annie and Robert are systematically reviewing the school's Integrated Sciences (ISC) course to find areas where climate health can be integrated.*

Abstract

Background: Climate change currently poses one of the greatest public health threats of the 21st century. While many healthcare professionals and medical students are concerned about the impact of climate change on patients, many do not feel confident addressing these issues. As of 2022, only half of United States medical schools mandate inclusion of climate-related health education in their curricula. In this study, we sought student perspectives on the inclusion of climate health curricula.

Methods: We designed and delivered a student-led lecture aimed for preclinical medical students covering climate health, environmental justice, and health system climate resiliency. Additionally, we distributed a validated survey before and after this newly integrated class session. Responses were scored using 5-point Likert-scale items, gauging students' knowledge and interest on climate health and environmental justice. Data was analyzed using descriptive statistics. Open responses were analyzed thematically.

Results: 98% of students pre and post session agreed that climate change affects health. After the session, 96% agreed that physicians should know about climate health and 80.2% indicated increased confidence in speaking to patients about climate health, a statistically significant increase as compared to pre-lecture. Students also indicated a need for ongoing education on climate health with particular emphasis on vulnerable populations and demonstrated an increased understanding in the myriad of ways health is impacted by changing environments.

Conclusion: This study provides the foundation for further climate health curriculum. Course material addressed longitudinal themes of social justice and health equity, in alignment with school learning objectives. Medical students are eager to learn about climate health with broad interest in additional resources, opportunities for involvement, and formal integration into the clinical sciences.

Inspiration: As future providers and stakeholders in health systems, we are in a unique position both as first responders but also as contributors to climate change. It is hard to overstate the impacts of climate change and its downstream effects such as increasing temperatures, extreme weather events, evolving infectious disease epidemiology continues to worsen health outcomes and widen health disparities. Simultaneously climate change disrupts our ability to deliver care and patients' ability to access it. Vulnerable populations who contribute the least to climate change continue to bear the brunt of these impacts and it is critical that we look at climate health through a lens of health equity.

Curriculum Development and Educational Projects

Poster Snapshot

Geisinger College of Health Sciences

amsa
American Medical Student Association

Climate Change as a Threat Multiplier: The Case for Student Initiative in Climate Health Education

Annie Yu BA, Robert Pritchard BA, Tracy Tran BS, Amanda Caleb PhD, MPH

Introduction

Climate change is the greatest threat to human health of the 21st century. Around the world, incidents of wildfires, vector-borne diseases, extreme temperatures, and droughts are all increasing. The most vulnerable communities who contribute the least to climate change continue suffer the most. These deep inequities in human health caused by climate change will continue to worsen. In addition, climate change decreases our ability to delivery timely care to our patients. This is what we mean when we call climate change a threat multiplier.[1]

As the effects of climate change become more readily apparent, physicians will need a working understanding of climate health to better care for their patients. While medical students are concerned about the impacts of climate change on patients, many feel underprepared and lack confidence in addressing these issues.[2]

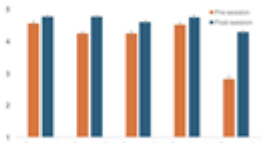
In 2022, only half of United States medical schools include mandatory climate-related health education.[3] Geisinger Commonwealth School of Medicine offers a community-based model of medical education including a preclinical course titled Patient and Physician Centered Care (PPCC) that focuses on public health, cultural awareness, and quality improvement. PPCC exists as a part of the larger Total Health Curriculum which focuses on six longitudinal themes: community immersion, health system citizenship, personal and professional development, population health, primary care, and social justice & health equity.[4] In alignment with these themes, we began to add material on climate health, environmental justice, and health system climate resiliency, starting with PPCC.

Scan to view our student led lecture :)

Methods

We designed and delivered a student-led lecture aimed for preclinical medical students introducing climate health, environmental justice, and health system climate resiliency as prework for an existing session on Environmental Justice. Additionally, we distributed a validated survey before and after this session[2]. Responses were scored using 5-point Likert-scale items, gauging students' knowledge and interest on climate health. "Strongly agree" was scored as 5, "strongly disagree" was scored as 1, with the neutral response "neither agree nor disagree" scored as 3. Data were analyzed using descriptive statistics and thematic analysis.

Results



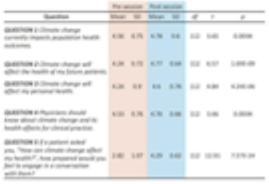


Figure 1. Mean student responses to survey questions before and after class session. N = 113. Error bars represent standard error of the mean. All analyses performed with paired two-tailed t-test. Survey questions adapted from Hampshire et al. 2022[2]

Figure 2a. Categorized student responses to "What is the largest health impact of climate change?" pre-session survey.

Figure 2b. Categorized student responses to "What is the largest health impact of climate change?" post-session survey.

Discussion

Most students already believe climate change directly affects public health, however, many noted they would have difficulty talking to patients about climate change. Post-session, more students rated climate change as a health concern and there was a significant jump in "Confidence talking with patients about climate health" from a mean score of 2.82 to 4.29. There were statistically significant increases in responses to all 5 questions post-session with 96% of students agreeing that physicians should know about climate health and 80% indicating increased confidence in counseling patients about climate health.

In pre-session responses, students' answers fell into 3 categories: environmental impacts, health conditions, and social determinants of health. In post-session responses, students showed a shift towards the impacts of climate change on social determinants of health, reflecting our lecture's focus on vulnerable populations and the ways in which climate change widens health disparities. Additionally, responses post-session were more descriptive and specific, reflected by the increase in average word count per response. Students also indicated a need for ongoing education on climate health, and almost half of students asked opportunities for advocacy, community engagement, and patient narratives.

Future steps include implementing student suggestions and integrating climate health material into the Integrated Science Course which covers organ-system presentations of disease.

References

1. World Health Organization. (2023, October 12). Climate change. World Health Organization. https://www.who.int/news-room/fact-sheets/detail/climate-change-and-health
2. Karly Hampshire, Allan Ndovu, Hridoy Bhanikhirani, Nicholas Iverson, Perspectives on climate change in medical school curricula - A survey of U.S. medical students, The Journal of Climate Change and Health, Volume 4, 2021, 100055, ISSN 2667-2782
3. Trilling, D. (2022, January 19). Bringing climate change into medical school. The Salata Institute. https://salatainstitute.harvard.edu/bringing-climate-change-into-medical-school/#:~:text=The%20Association%20of%20American%20Medical,from%202017%20to%202020%20reported
4. MD Program curriculum. Total Health Curriculum. (n.d.). https://www.geisinger.edu/gcsh/education/grants/academics/md-program

30

Development of a Cocurricular Program to Educate Pre-Health Students About Social Determinants of Health

Autumn Woolpert[1]
[1]Creighton University

Biography: *Autumn Woolpert is a pre-medical senior at Creighton University pursuing a major in finance and minor in biology with the goal of owning a medical practice in Hawaii, where she grew up. She has been involved with research in both biology and population health. Autumn is a student team leader in the Schlegel Center for Service and Justice, where she has coordinated spring break service and justice trips, led semester-long service programs, and helped develop a new discussion-based program to introduce pre-health students to social determinants of health. Autumn also serves as the VP of Political Advocacy for Creighton University's chapter of Students for a National Health Program, where she has learned about the effect of the current US healthcare financing system on healthcare access and quality while advocating for health justice. Her clinical work as a CNA has allowed her to help care for a diversity of patients, which has fueled her passion for health equity.*

Abstract

Background: This co-curricular program was developed to introduce social determinants of health (SDoH) to pre-health students through student-led discussion and reflection alongside relevant service, advocacy, and other community engagement. It goes beyond coursework by enabling students to reflect on and integrate knowledge outside the classroom.

Methods: A planning team established a framework for the program, outlined content, and connected with potential community partners and guest speakers. Student leaders were trained to lead 22 students in six weekly, 90-minute discussions, each focused on a social determinant of health defined by the CDC. Informational content was compiled from literature and case studies. Participants visited two local organizations addressing social determinants of health and directly served the community once. Two guest speakers shared patient stories that humanized data trends. Finally, participants were supported in contacting their senators and representatives about an issue encompassed by SDoH.

Results: Participants completed evaluations at the conclusion of the program. Respondents' self-rated knowledge of SDoH before and after the program improved from an average of 5.12 to 8.12 out of ten. 95% indicated that this program improved or confirmed their desire to implement considerations of SDoH into their career. 100% said they would recommend the program to others. Participants particularly enjoyed patient stories from guest speakers, discussing case studies, volunteering, and building community with other students who have an interest in health justice. They felt they grew through the advocacy activity, volunteer experience, and honest conversations about current systemic issues. They felt their understanding of SDoH were improved by the discussion format and community experiences. Challenges included making the content relevant for a wide range of participant interests and coordinating with community partners.

Conclusion: Overall, the pilot program was successful and valuable for participants. Future iterations of this program will include expanded content and more frequent service opportunities, per participant suggestions.

Inspiration: Students often think of their coursework and service as existing in silos, which makes it difficult to synthesize experiences and knowledge. This program sought to intentionally combine educational content and direct service to allow students to understand how SDoH might affect their patients at a personal level by considering their own actions and consequences as future healthcare professionals. The hope for this project was to implement a lasting program that will help create future practitioners who are more compassionate and competent because they understand the broader social contexts and systems that affect patients' health.

Curriculum Development and Educational Projects

31

Empowering medical students to address spiritual needs in patient care: a new curriculum

Vibha Sastri[1]
[1]University of Virginia School of Medicine

Biography: *Vibha Sastri is a rising fourth-year medical student at the University of Virginia School of Medicine. She graduated from Rice University with a B.A. in Religion, and she continues exploring the intersection of spirituality and medicine at UVA, as an Edward W. Hook Scholar in Humanities and Ethics. She will be applying to pediatric residency programs this Fall.*

Abstract

Background: Decades of research underscores that spirituality is important to most patients, it influences medical decision-making, and unaddressed spiritual needs correlate with worse health outcomes. The turn of the 21st century brought a surge in the development of spiritual history-taking tools for providers, and with it came the incorporation of spirituality/religion into medical education. However, there is limited evidence on the efficacy of such curricular interventions – especially in de-stigmatizing the role providers can play in advocating for the spiritual needs of their patients. There have also been limited efforts to adapt spiritual history-taking tools for a changing sociocultural landscape. This project details a new longitudinal thread at the UVA School of Medicine, aimed at empowering medical students to discuss spirituality/religion in routine patient care and to understand "spiritually sensitive care" as analogous to "patient-centered care."

Methods: Following a literature review, a new workshop was developed for first-year medical students within the Foundations of Clinical Medicine course. It involved a lecture followed by small-group breakout sessions. In the lecture, students learned the benefits of discussing spirituality/religion with patients, and they were introduced to chaplaincy services. They were then taught a novel approach to spiritual history-taking: open-ended question always, FICA tool for a more comprehensive history as needed. In the breakout sessions, students observed a real FICA-guided history between two educators, they practiced spiritual history-taking with a peer, and they reflected on the experience. Students later had the opportunity, within the Patient-Student Partnership program, to elicit a spiritual history as an end-of-semester project.

Results: The workshop was successfully delivered to 150+ first-year medical students in the Class of 2027. The 15-minute lecture and 20-minute breakout sessions were co-led by a third-year medical student and two chaplains. 26 students chose, as their end-of-semester project, to take a spiritual history with their longitudinal patient partner.

Conclusion: This spirituality thread addresses gaps in other curricula by A) emphasizing that spirituality/religion impacts patient outcomes beyond stereotypical ethical conflicts, B) providing a new approach to spiritual history-taking (open-ended question followed by customizable FICA-guided history) that is both systematic for new learners and flexible for providers with time constraints, C) cultivating connection amongst peers by having students practice history-taking as themselves, and D) cementing knowledge by allowing students to collect a history with their longitudinal patient partner. This curriculum is currently undergoing revision and will be delivered to the Class of 2028.

Curriculum Development and Educational Projects

32

Evaluating Planetary Health in Medical Education

Weilin Qiu[1]
[1]University of Alberta Faculty of Medicine and Dentistry

Biography: *Weilin Qiu, a medical student at the University of Alberta and Senior Environmental Sustainability Representative for the Medical Students' Association, is driven by a deep commitment to planetary health. She advocates for embedding it into core curricula to better equip future physicians for climate-related health challenges, emphasizing the vital link between human and planetary well-being, and the urgency of sustainable healthcare and environmental conservation.*

Abstract

Background: Planetary health, which examines the impact of climate change and environmental degradation on human health, is increasingly recognized as a critical component of medical education. However, many medical programs lack structured integration of planetary health principles into their core curricula. The Planetary Health Report Card (PHRC) is a student-led initiative designed to assess and promote sustainability and climate-conscious education within medical institutions. This study evaluates the extent to which planetary health is integrated into medical education and identifies areas for improvement.

Methods: The PHRC was used to assess planetary health education in a North American medical program. This evaluation was conducted using a standardized framework that examines institutional sustainability, curriculum content, student-led initiatives, research efforts, and community outreach. The review process included an analysis of course syllabi, faculty interviews, and student feedback to determine existing strengths and gaps in planetary health education.

Results: The assessment identified strengths in research contributions and the availability of planetary health electives. A structured planetary health elective was introduced, covering climate-conscious patient care, sustainable healthcare practices, and environmental policy advocacy. A separate elective incorporated Indigenous knowledge, land-based learning, and disaster response simulations. However, while these elective opportunities exist, planetary health content remains minimally integrated into required courses. Core medical education lacks structured teaching on climate change and its health impacts, sustainability in healthcare, and mitigation strategies. The institution received an overall grade of B, highlighting its research contributions but emphasizing the need for better curricular integration.

Conclusion: Integrating planetary health into medical curricula is essential for preparing future physicians to address climate-related health challenges. Findings from this assessment underscore the need for structured planetary health education within core courses, enhanced faculty engagement, and sustainability initiatives in clinical training. By embedding these principles in medical education, future healthcare providers will be better equipped to mitigate the environmental impact of healthcare and address the growing health burdens of climate change.

Inspiration: The undeniable link between environmental health and human health demands urgent action. Addressing this crisis requires a fundamental shift in medical education to ensure future physicians understand and advocate for sustainable healthcare practices. This project stems from a deep commitment to equipping medical professionals with the knowledge and tools needed to combat climate-related health inequities. By strengthening planetary health education, medical schools can empower students to become leaders in sustainable healthcare, ensuring a healthier future for both people and the planet.

Curriculum Development and Educational Projects

Poster Snapshot

Integrating Planetary Health into Medical Education

Weilin Qiu[1]
[1]Faculty of Medicine & Dentistry, University of Alberta

Background

Climate change is one of the greatest public health threats of our time. Despite its urgency, planetary health education remains limited within medical school curricula. The Planetary Health Report Card (PHRC) is a student-driven initiative aims to assess the extent to which planetary health is incorporated into medical training and identify opportunities for improvement. The goal is to ensure future physicians are equipped with the knowledge and skills necessary to address the health impacts of climate change and promote sustainable healthcare practices.

This project assessed planetary health integration at the University of Alberta's medical school to identify curricular gaps and opportunities for meaningful integration.

Methods

The Planetary Health Report Card (PHRC) was utilized, assessing five key areas:

1. Curriculum integration
2. Interdisciplinary research
3. Student-led initiatives
4. Community outreach
5. Institutional sustainability

Data was gathered via syllabus reviews, faculty interviews, and student surveys.

Results

	Grade	Justification
1: Curriculum	C-	Limited core integration. Electives available covering climate-conscious patient care and sustainable practices.
2: Research	D+	Limited planetary health research community and low visibility of resources.
3: Student-Led Initiatives	C	Adequate support for student-led sustainability projects but lacking dedicated faculty support.
4: Community Outreach	D+	Minimal community engagement; needs improvement in advocacy efforts.
5: Campus Sustainability	C-	Institutional sustainability efforts underway, but gaps remain.

Overall Institutional Grade: C-

While promising steps have been made—such as introducing a hands-on planetary health elective—core curricular integration is minimal. Cross-departmental collaboration, Indigenous knowledge inclusion, and patient-centered environmental health education are lacking.

Recommendations

- ✓ Develop a longitudinal planetary health curriculum
- ✓ Appoint faculty leads for planetary health integration
- ✓ Establish interdisciplinary planetary health research hub
- ✓ Strengthen community partnerships and advocacy efforts
- ✓ Promote sustainable practices in clinical and institutional settings

We encourage more medical students to become involved in the Planetary Health Report Card initiative, evaluating their medical curricula and advocating for meaningful change at their institutions.

Conclusions

Medical schools must urgently adapt curricula to prepare students for the health effects of climate change. Students must be equipped with the knowledge and skills to address climate-related health challenges and implement sustainable healthcare practices. Strengthening planetary health education within the curriculum will ensure future physicians are prepared to mitigate the environmental impact of healthcare and advocate for policies that promote both planetary and human health.

Contact Info

Weilin Qiu
MS2, University of Alberta
wqiu@ualberta.ca

phreportcard.org

Sustainable healthcare is not a luxury—it's a necessity. As future physicians, we have a responsibility to care not just for our patients, but also for the planet we depend on.

33

Fostering Change in Medicine: Bridging Gaps Through Mentorship and Communication Competency Training

Danielle Pierson[1], Dr. Kari Dugger
[1]Edward Via College of Osteopathic Medicine Auburn

Biography: *Danielle Pierson is a third-year medical student at Edward Via College of Osteopathic Medicine (VCOM) with a strong interest in hematology and oncology. She earned a Bachelor of Science in Biology from the University of North Carolina at Asheville and a Master of Arts in Biomedical Sciences from Bluefield University. Her research is dedicated to advancing equity in healthcare through enhanced mentorship and the development of inclusive healthcare practices. Danielle is actively involved in various research projects at VCOM, including investigating the effects of physical and psychological stressors on breast tumor growth and tumor immunity, as well as exploring the impact of psychological safety within pre-medical student learning teams. She has presented her work at the Auburn University Harrison College of Pharmacy Department of Drug Discovery & Development Seminar Series. Danielle aspires to pursue a residency in internal medicine, with a long-term goal to contribute to advancements in hematology and oncology.*

Abstract

Background: The next generations of physicians will need to be prepared to deliver tailored and receptive patient care that will address health needs of everyone including those that may be compounded by social risk factors that influence their health. We will address these challenges by 1) expanding peer-based recruitment strategies at institutions underrepresented in medicine and 2) driving professional identity formation through discussions relevant to patient-responsive healthcare. By prioritizing mentorship and communication competency training, we will promote a group of physicians that will, in part, advance healthcare.

Methods: Current medical students are participating as Ambassadors. They are assigned to 1 of 12 Alabama institutions. Second-year students were assigned based on personal preference, while third/fourth-year students were assigned based on their clinical rotation site. Ambassadors contacted their respective institutions offering medical information sessions and individual peer mentorship. Medical school applications and acceptances from the past three years will be compared to the current cycle to determine the impact at each institution. Ambassadors are participating in monthly discussions highlighting the challenges of healthcare to enhance their ability to connect with a variety of patient populations. Pre- and post-surveys are administered to assess student growth.

Results: Ambassadors have completed at least one meeting with their respective institution. Follow-up communications with undergraduates has been challenging. Early findings from the pre-survey showed Ambassadors have a strong awareness of cultural biases in healthcare but have uncertainty regarding strategies to address these issues. Data collection is ongoing.

Conclusion: We highlight a proactive role for medical schools to impact healthcare gaps. Preliminary results show medical students understand the need for tailored responsiveness, though they need assistance in developing actionable strategies. Further, maintaining contact with pre-med undergraduate students has been difficult and needs further consideration.

Inspiration: Despite efforts to gain higher involvement from communities with limited representation in healthcare, the physician population has remained constant which may negatively impact patient outcomes and access to quality medical care. We aim to define and reduce barriers, either real or perceived, of undergraduates from a variety of lived experiences. By expanding recruitment efforts, providing peer mentorship, and prioritizing discussions surrounding the challenges of healthcare, we will empower medical students to be an active participant in building a broadly representative physician workforce. Further, data shows the importance of sustained efforts from peers to initiate and maintain communications regarding the barriers of delivering quality healthcare that is responsive, empathetic, and effective for all populations.

Curriculum Development and Educational Projects

Poster Snapshot

Fostering Change in Medicine: Bridging Gaps Through Mentorship and Communication Competency Training

Danielle Pierson, M.S., OMS-III[1], Mayra Rodriguez, MPH, Ph.D[1], Ellen Wilson, M.Ed[2], and Kari Dugger, Ph.D[1]
[1]Department of Biomedical Sciences and [2]Student Admissions, Edward Via College of Osteopathic Medicine , Auburn, AL.

Background

Rationale: The next generation of physicians must be equipped to deliver personalized and effective healthcare that addresses the varied health needs of all individuals, especially those impacted by socio-economic risk factors.

Recognizing this need, our project aims to prepare a responsive healthcare workforce through:

1. **Expanding Peer-Based Recruitment Strategies:** Targeting institutions with high numbers of students from low-income and resource-limited backgrounds.
2. **Enhancing Professional Identity Formation:** Tailored discussions that focus on patient-centered healthcare, our program emphasizes the importance of mentorship and communication skills.

Objective: Promote a group of physicians that will, in part, advance healthcare by prioritizing mentorship and communication competency training

Methods

Current medical students are participating as Ambassadors. They are assigned to 1 of 12 Alabama institutions.

Ambassadors contacted respective institutions offering information sessions and peer mentorship

Data Collection

- Medical school applications and acceptances from the past 3 years will be compared to current cycle to determine impact at each institution
- Ambassadors participate in monthly communication competency training with pre-and post surveys administered

Results

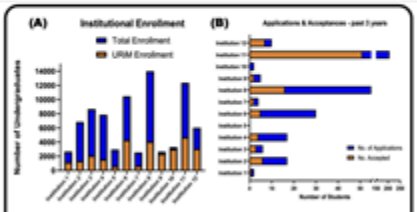


Figure 2. (A) Institution Enrollment Comparison. The total undergraduate enrollment (blue bars) and underrepresented in medicine (URM) enrollment (orange bars) across twelve institutions. This data highlights variations in URM representation relative to total enrollment at each institution. **(B). Applications and Acceptances Over the Past Three years.** This data compares the number of applicants to VCOM (blue bars) and those accepted (orange bars) across twelve institutions over the past three years, highlighting the acceptance ratios at each institution.

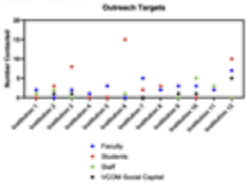


Figure 3. Outreach Contacts by Institution. This scatter plot depicts the number of contacts made with faculty, students, staff, and VCOM social capital at twelve institutions. The distribution of contacts illustrates the engagement level with different groups within each institution to foster collaboration and support.

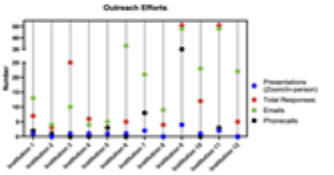


Figure 4. Types of Outreach Efforts. This data illustrates the volume and types of outreach efforts undertaken by student ambassadors across twelve institutions. It shows the number of presentations, responses, emails, and phone calls, providing insight into the communication strategies employed to engage each institution. Outreach contacts and response rates was a major limiting factor for success.

Conclusions

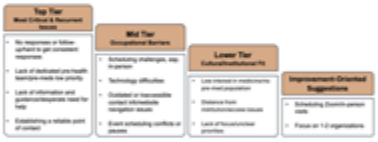


Figure 5. Ranked Outreach Challenges. We categorized outreach challenges into three tiers: Top Tier detailing critical issues such as communication breakdowns and lack of support; Mid Tier addressing operational barriers like scheduling conflicts and tech issues; Lower Tier focusing on institutional challenges. Suggestions for improvements include better scheduling practices and targeted organizational focus.

Top Priority	Mid Priority	Lower Priority
• MCAT Prep & Study Tips • Interview Prep & Mock Interviews • Application Process Guidance • Info Sessions & Q&A Panels • Advising Guidance	• Intro to Osteopathic Medicine/ OMM • VCOM Tour/ Day in the Life • Simulation Workshops (CPR, Suturing, etc...) • COMLEX vs. USMLE • Shadowing/Clinical Experience Tips	• Extra Pre-Med Courses • VCOM Extracurriculars • Imposter Syndrome • Work-Life Balance

Table 1. Prioritized Outreach Topics for VCOM. We organized outreach topics requested by institutions into 3 priorities. Top priority included essential application and interview preparations. Mid Priority focused on osteopathic medicine fundamentals and hands-on experiences. Lower Priority dealt with supplementary support like work-life balance. The prioritization provided here aims to streamline VCOM's outreach effectively in our future efforts.

Strategic Initiatives: Implementing strategic initiatives such as targeted outreach and enhanced communication methods that will not only streamline interactions but also improve access to medical education resources, thereby fostering a well-prepared applicant pool.

References

1. Jongen C, McCalman J, Bainbridge R. Health workforce cultural competency interventions: a systematic scoping review. BMC Health Serv Res. 2018;18(1):232. doi:10.1186/s12913-018-3031-6
2. Bajpai R, Mali S, Bajpai R, Singh A. A review on cultural competency in medical education. J Family Med Prim Care. 2022;11(8):4319-4326. doi:10.4103/jfmpc.jfmpc_2148_21
3. Hansel LW, Zahmat L, Woolhandler S, Bor DH, McCormick D. Minority Physicians' Role in the Care of Underserved Patients: Diversifying the Physician Workforce May Be Key in Addressing Health Disparities. Am J Public Health. 2014;104(2):289-291. doi:10.2105/AJPH.2013.301458

Acknowledgements

- Edward Via College of Osteopathic Medicine Institutional Review Board, [IRB #: 2205671-2] *Empowering a Relational Professional Identity Among Medical Students to Increase Under-Represented in Medicine (URiM) Applicants.* Approved June 30, 2024
- Funding provided by American Association of Colleges of Osteopathic Medicine (AACOM), AACOM Education Research Grant awarded on July 1, 2024.

34

Gender Disparities in Medical Student Clinical Experiences during Obstetrics and Gynecology Rotations in USA

Naushad Khan[1], Luv Agarwal[2], Ritesh Sheth[3], Rehana Shaikh[1]
[1]Windsor University School of Medicine, [2]All Saints University School of Medicine, [3]Spartan Health Sciences University

Biography: *Naushad is a medical student at Windsor University School of Medicine, pursuing clinical rotations in the United States. He is interested in the fields of General Surgery, Psychiatry, Obstetrics and Gynecology and Anesthesiology for Residency training. With a strong interest in medical education and health equity, he is dedicated to exploring gender disparities in clinical training, particularly in Obstetrics and Gynecology rotations. His research aims to highlight the challenges faced by medical students and contribute to more equitable learning environments.Beyond medicine, Naushad is passionate about helping students from around the world through his YouTube channel, where he shares insights on medical education and personal growth and Live Study With Me videos. He has created a discord Study Community with over 8000 students to help them find safe space and peers to study/work online with. A fitness enthusiast, he has been a competitive swimmer, also swimming for his Medical School in the Caribbean. He is also a dedicated runner and recently ran his first ultra marathon.*

Abstract

Background: The experience of Medical students during Clinical Rotations plays a crucial role in determining their future career aspirations and in the development of clinical skills and knowledge. In particular, in Obstetrics and Gynecology (ObGyn) rotations, the gender of medical students may impact the level of exposure and hands-on clinical experience they gain, the amount of patient interaction and opportunities to participate in procedures. This study explores the gender differences that students experience during ObGyn Clinical Rotation in the United States, thus providing insights into the current challenges of Medical Education and its implications on ObGyn and Medicine.

Methods: An online survey will be shared with Medical students who have completed ObGyn Clinical Rotations in the last four years in the United States. The survey aims to collect both quantitative and qualitative data about key aspects like Clinical experience, comfort in performing physical and pelvic exams, patient interaction and perceived barriers to learning. The Qualitative and Quantitative data will be analyzed and presented to draw out trends and outline challenges.

Results: The study is currently in the data collection phase. Preliminary findings suggest that gender does influence the clinical experience of medical students during ObGyn Rotations, with male students reporting challenges and fewer opportunities during clinical examinations and female students expressing possible preferential treatment. Additional results will help provide more insights into these and other possible disparities.

Conclusion: By exploring and identifying the gender-based differences in ObGyn Clinical Rotation experience, this study aims to highlight areas of Medical Education that have potential for improvement and provide more equitable learning experiences and opportunities irrespective of gender differences. The aim is to address the disparities and thus provide a more inclusive training environment, ultimately fostering a more gender-balanced training environment and future physician workforce in Women's Health.

Inspiration: As a current Medical Student doing my ObGyn Clinical Rotation, I have personally observed how gender can influence Clinical experiences, leading me to further explore this topic. I am driven to work on this research by my passion for education equity and my commitment to ensuring that all students regardless of gender, receive comprehensive and fair training during their medical education. By working on this project and shedding light on these disparities, I want to contribute to meaningful discussions on diversity and inclusion during clinical training, ultimately advocating for policy changes and real work impact that enhance education for future physicians and generations.

Curriculum Development and Educational Projects

35

Grass Roots Implementation of Lifestyle Medicine in the Pre-Clinical Medical Curriculum

Anjali Venkat[1], **Ethan Belnap**[1], **Riana Schleicher**[1], Dr. Courtney Stefanski[1]
[1]Rush Medical College of Rush University Medical Center

Biography: *Anjali Venkat is a 3rd year medical student at Rush Medical College in Chicago, IL. She is originally from Winston Salem, North Carolina and graduated from University of North Carolina Chapel Hill. She is interested in pursuing preventative medicine through either Family Medicine or Med-Peds and hopes to increase awareness of Lifestyle Medicine in medical school and residency curricula throughout her career. Outside of medical school, she enjoys yoga, cooking, reading, traveling and spending time with family and friends.*

Abstract

Background: Lifestyle Medicine (LM) is an emerging specialty which uses evidence-based interventions to prevent, treat, and reverse chronic conditions. Despite myriad studies showing the benefit of LM and increasing medical student interest, there is minimal integration into US medical schools' curriculum. This study seeks to gauge interest in LM at Rush Medical College and examine a mechanism for grass roots incorporation of LM pillars into the medical school curriculum.

Methods: This is a survey-based prospective study conducted at Rush Medical College in Chicago, IL. First-year medical students were recruited at a club fair and via promotional emails. Participants chose to attend 1-2 LM curriculum sessions focusing on specific LM core competencies. Both antecedent to and following each session, students completed surveys on a scale of 1-10 self-assessing LM familiarity, knowledge of LM principles, ability to implement LM, and comfortability utilizing motivational interviewing (MI) to improve specific LM facets for patients.

Results: Out of 144 first-year medical students at Rush Medical College, 25 attended at least 1 LM teaching session. Prior to class, the average familiarity with LM was 5.06 and comfortability utilizing LM in practice was 5.12. After the class, students showed an average improvement of 60% in concepts of LM. The average self-assessed improvement in LM scientific knowledge, technical ability to teach and implement LM, and comfortability in utilizing LM principles in MI was 19.8%, 25.6%, and 49.68%, respectively.

Conclusion: Our results suggest significant interest from medical students to engage in LM training. Our data also indicates targeted classes on LM core principles leads to improved LM scientific knowledge, technical implementation, and MI skills. These results suggest the importance of LM curriculum integration. Furthermore, targeted classes taught by LM-trained upperclassmen may be a grass roots mechanism used to implement LM into medical schools prior to complete curriculum integration.

Inspiration: Coming to medical school, we expected a thorough education in healthy living as a means of disease prevention. However, what we found was a curriculum focused centrally on the treatment of pre-existing conditions. Lifestyle Medicine, with its focus on prevention of chronic conditions, illuminated a new side of medicine. We seek to further integration efforts of LM into medical schools curriculums nationally. By advocating for these principles early in medical training, we hope to empower future physicians to prioritize prevention and holistic care. This approach holds the potential to make medicine more sustainable, accessible, and focused on long-term patient well-being.

Curriculum Development and Educational Projects

36

Healthcare and Medical Simulation to Aid Mental Health and Abuse Encounters

Bairavi Maheswaran[1]
[1]New York Institute of Technology College of Osteopathic Medicine

Biography: *Bairavi Maheswaran is a 4th-year medical student at NYITCOM on the Old Westbury Campus, pursuing a career in Psychiatry. Alongside her medical degree, she is completing a master's in Medical and Healthcare Simulation, which has allowed her to explore innovative ways to approach mental health crises and bring greater awareness to the realities patients experience. Through her coursework, Bairavi has developed strategies to create immersive learning experiences that enhance empathy and understanding in medical training, further fueling her passion for mental health advocacy. She is dedicated to empowering youth to become mental health advocates, addressing cultural stigmas in South Asian communities, and enhancing domestic violence education in medical curricula. Bairavi's experiences have shaped her holistic approach to psychiatry, where she aims to support and educate patients in understanding their mental health while exploring the interconnectedness of physical and emotional well-being.*

Abstract

Background: This project was driven by the need to better equip healthcare providers and first responders with skills in recognizing and managing mental health crises and domestic violence situations. Traditional training methods often lack the realism necessary to build confidence in handling these complex scenarios. The vision is to create a more compassionate and prepared healthcare workforce by integrating immersive simulation-based education into medical training.

Methods: This training program targets medical students and healthcare providers, combining virtual reality (VR) simulations and standardized patient (SP) encounters to enhance skills in empathy, de-escalation, and trauma-informed care. VR simulations create high-pressure scenarios replicating real-life mental health crises, allowing participants to practice critical skills while receiving real-time feedback. SP encounters complement VR by providing hands-on experience in communication and early abuse detection. Training begins with PowerPoint modules, supported by videos and recordings from the school's tech department, while ongoing discussions with the engineering department aim to refine VR platform development. Data collection is conducted through RedCap.

Results: As the project is still ongoing, preliminary feedback indicates that trainees feel more confident navigating sensitive conversations and recognizing subtle signs of abuse. Early observations suggest an improvement in participants' ability to apply trauma-informed care principles. Further data collection is planned to measure diagnostic accuracy and response effectiveness, with completion expected by or after April 19, 2025. These findings will help assess the program's overall impact on clinical preparedness and empathy-driven care.

Conclusion: Integrating VR simulations and SP encounters into medical training offers a novel approach to enhancing preparedness for mental health crises and domestic violence scenarios. This dual-method training has the potential to reshape traditional medical education by equipping future clinicians with practical skills that lead to more compassionate and effective patient care.

Inspiration: My passion for this project stems from a deep commitment to mental health advocacy and the desire to close gaps in training for trauma-informed care. Witnessing healthcare providers struggle with navigating sensitive conversations and identifying subtle signs of abuse inspired me to seek innovative solutions. By integrating VR and SP encounters into medical education, I hope to empower future clinicians to approach patient care with confidence, empathy, and a deeper understanding of trauma. This project envisions a future where immersive training becomes a cornerstone of medical education, ensuring that vulnerable patients receive the compassionate care they deserve while fostering systemic change in mental health crisis management.

Curriculum Development and Educational Projects

Poster Snapshot

NEW YORK INSTITUTE OF TECHNOLOGY
College of Osteopathic Medicine

Healthcare and Medical Simulation to Aid Mental Health and Abuse Encounters

Bairavi Maheswaran, MS, OMS-4; Paula Ryo D.O.

Background

This project was driven by the need to better equip healthcare providers and first responders with skills in recognizing and managing mental health crises and domestic violence situations. Traditional training methods often lack the realism necessary to build confidence in handling these complex scenarios. The vision is to create a more compassionate and prepared healthcare workforce by integrating immersive simulation-based education into medical training.

In recent years mental health has been an emerging topic due to individuals regarding their psychological and emotional well-being as a vital component of their overall health. Although there has been an increase in support services and awareness of how to approach patients with mental health disorders, there is a decline in patients continuing supportive care. A range of factors can limit patients from seeking further aid, such as the lack of access to resources, fear of discrimination, or cultural restrictions. Yet, another reason individuals do not seek support, especially victims of partner violence, is that they are not being identified as victims of abuse. In other words, medical teams often overlook the signs that a patient has been abused by their significant other and often leave the clinics without the support they need.

A vital aspect to note is that victims of different types of traumas come to medical settings to get help but depending on the level of trauma, most victims do not know how to express what happened to them and do not know who to trust. Hence, victims can hide signs of their abuse from medical professionals or change facts regarding their medical or social histories (Rakovec-Felser, 2014). Further, students and professionals can have discomfort when asking sensitive questions regarding abuse and mental health.

Simulation is an educational resource that can be incorporated into medical education and outside of healthcare to improve ones communication specifically with abuse patients, provide empathy and how to approach mental health scenarios. With an increased use of technology within healthcare, simulation such as virtual realities, can be used to allow individuals to be exposed to a mental health crisis environment allowing them to practice how to interact with patients during this time. Further virtual reality can be used to allow professionals to know how it feels to experience a mental health symptom such as hallucinations or delusion.

*"According to a Washington Post database on fatal shootings by on-duty police officers within the United States, **1 in 5** people fatally shot by police have mental illnesses. Over **1,400** people with mental illnesses have been killed by police since 2015. "*

Methods

Simulation Modality

Standardized Patients

Individuals who portray as patients to allow medical healthcare professionals to improve their communication and identification of abuse.

Virtual Reality

VR simulations create high-pressure scenarios replicating real-life mental health crises, allowing participants to practice critical skills while receiving real-time feedback

Knowledge and assessment tools :Pre-recorded online modules of Domestic Violence speakers,discussion with professionals who work with DV patients
, and how to take a domestic violence patients' history through case scenarios

Checklists for skills assessment :Communication, History Taking Checklist, and Identification of signs and presentations of the patient

Debriefing : Providing feedback and encouraging reflections

Results

As the project is still ongoing, preliminary feedback indicates that trainees feel more confident navigating sensitive conversations and recognizing subtle signs of abuse. Early observations suggest an improvement in participants' ability to apply trauma-informed care principles. Further data collection is planned to measure diagnostic accuracy and response effectiveness, with completion expected by or after April 19, 2025. These findings will help assess the program's overall impact on clinical preparedness and empathy-driven care. Results will be collected via RedCap surveys before and after the module as well as after the Standardized Patient Encounters.

Conclusion

Integrating VR simulations and SP encounters into medical training offers a novel approach to enhancing preparedness for mental health crises and domestic violence scenarios. This dual-method training has the potential to reshape traditional medical education by equipping future clinicians with practical skills that lead to more compassionate and effective patient care.

Discussion

Simulation-based training can transform how healthcare professionals and law enforcement respond mental health crises and abuse patients.. Standardized patients allow medical providers to practice empathetic communication, recognize signs of abuse, and apply trauma-informed care in a controlled setting. These realistic interactions help trainees develop confidence in asking sensitive questions, ensuring patient safety, and offering appropriate resources.

Virtual reality (VR) further expands training by immersing professionals in lifelike crisis scenarios, where they must navigate high-stress situations while honing de-escalation and decision-making skills. NYPD officers and healthcare workers can use VR to experience mental health crises from a patient's perspective, fostering deeper empathy and improving their ability to respond calmly and effectively. This technology also allows professionals to practice handling unpredictable encounters, such as community disturbances, where quick yet careful judgment is required.

By using standardized patients and VR, trainees gain hands-on experience that enhances their ability to intervene safely, compassionately, and efficiently. These advancements not only improve crisis response but also contribute to better overall mental health management by equipping professionals with the skills to recognize early warning signs, connect individuals with appropriate care, and reduce the risk of escalation. Simulation is revolutionizing crisis training by making learning more immersive, interactive, and impactful, ensuring better outcomes for both victims and responders while fostering a more compassionate approach to mental health care.

Future Implications

- Increase Awareness of this issue
- Encourage doctors to share experiences with domestic violence patients and encourage NYPD to partake in learning how to approach mental health scenarios and become more aware of the environment when arriving to the scene
- Incorporate domestic violence education and simulation training into the medical school curriculum and CME workshops
- Integrate simulation scenarios into existing courses such as clinical skills, ethics, and women's health, providing opportunities for hands-on learning in diverse educational settings.
- Policy Reforms

References

1. **Pinet, G. (2021). The Role of Simulation-Based Education for Domestic Violence Management. *Creative Education*, *12*(12), 2852-2862.**
2. **Manuel, R., Valcke, M., Keygnaert, I., & Roelens, K. (2021). Improving medical students' communication competencies to deal with intimate partner violence using clinical simulations in Mozambique. *BMC medical education*, *21*(1), 1-8.**
3. **Jiménez-Rodríguez, D., Belmonte-García, M. T., Sanabilias García, A., Plaza Del Pino, F. J., Ponce-Valencia, A., & Arroyuelo, O. (2020). Nurse training in gender-based violence using simulated nursing video consultations during the COVID-19 pandemic: A qualitative study. *International journal of environmental research and public health*, *17*(22), 8654.**

37

Impact of High-Fidelity Clinical Simulation on Clinical Performance Compared to Traditional Observational Learning

Sandra Fanous[1], **Hannah Mixon**[1], **Dana Parker**[1], **Mikaylah Rutledge**[1]
[1]Alabama College of Osteopathic Medicine

Biography*: Four medical students at the Alabama College of Osteopathic Medicine who are participating in a 1-year clinical simulation fellowship program while pursuing their Master's degree in adult education at Troy University.*

Abstract

Background: Medical simulation training has become a key component in modern medical education, offering a controlled, low-risk environment for skill development. Research has shown that high-fidelity simulations can enhance clinical reasoning and retention of medical knowledge, providing students with hands-on experience that traditional observational learning cannot. This study aims to explore the effectiveness of such simulations in improving clinical performance, particularly in comparison to the more passive approach of observational learning.

Methods: For this project, researchers conducted a cohort study comparing two groups of students involved in a Simulation competition. Cohort group 1 consisted of the 7 top-scoring teams from the preliminary round, while cohort group 2 included 7 teams that did not advance. Both groups participated in medical simulation training, with cohort 1 actively engaging in training weekly, while cohort 2 had limited participation with more observational learning. Data was collected over a 5-week period and analyzed using statistical methods to assess the impact of high-fidelity simulations on clinical performance compared to traditional observational learning.

Results: Final data collection was gathered from six control teams (cohort 1) and seven variable teams (cohort 2). Results were obtained by averaging the scores of four coaches who graded each team's weekly encounter over the span of their respective training. The mean scores were then compared between the two cohorts using t-tests. The overarching result was that the control group outperformed the variable group when comparing the means with a calculated p-value of .044 (p=0.05), which shows statistical significance.

Conclusions: Preliminary analysis of the data indicates that increased hands-on training time correlates with higher performance outcomes. This underscores the importance of incorporating scenario-based medical simulation into medical school curricula.

Inspiration: The inspiration for this study stems from the growing recognition of simulation learning as a transformative tool in medical education. High-fidelity simulations provide an immersive experience that bridges the gap between theory and real-world application, enhancing clinical skills in a risk-free environment. As the healthcare field becomes increasingly complex, simulation-based training is crucial for preparing students to navigate challenging clinical scenarios with confidence while imposing minimal risk. The Simulation competition has been a crucial component of ACOM's approach to medical education. This research allowed double the number of students to participate in the simulation competition, enhancing their clinical skills, teamwork, critical thinking, and humanistic approach before clinical rotations.

Curriculum Development and Educational Projects

Poster Snapshot

Impact of High-Fidelity Clinical Simulation on Clinical Performance Compared to Traditional Observational Learning

Alabama College of Osteopathic Medicine (ACOM), Dothan, AL
Mikaylah Rutledge, Dana Marie Parker, Hannah Mixon, Sandra Fanous, & James Nolin, FNP-C, PhD

BACKGROUND

Medical simulation training is a vital part of modern medical education. High-fidelity simulation (HFS), a form of simulation-based education (SBE), offers students early exposure to clinical scenarios and facilitates the development of key skills in patient management and clinical decision-making (Meyers et al., 2020). Although the benefits of active learning are broadly accepted, few studies have directly compared its impact against observational learning in HFS environments, particularly in structured team-based competitions (Tutticci et al., 2022). This study aims to fill this gap by directly comparing the effectiveness of HFS in improving clinical performance, specifically comparing students who actively participate each week to those who primarily observe.

METHODS

This cohort study compared the clinical performance of two student groups (70 total participants) in a simulation competition. Simulation competition teams, each consisting of five medical students, were evaluated based on their responses to emergent clinical scenarios. **Cohort 1** consisted of the top 7 teams from a preliminary round and were actively engaged in weekly HFS training. Cohort 2 included 7 teams that did not advance and had limited participation, with more emphasis on observational learning. Over 5 weeks, both groups underwent medical simulation training, with **Cohort 1** participating in weekly HFS sessions and Cohort 2 only participating in 3 of the 5 weekly sessions while observing the remaining weeks. Figure 1 demonstrates the HFS room set up. Teams were scored using a standardized rubric accessible via the labeled QR code. Both cohorts were also assessed via a 20-question multiple-choice pre-test given prior to their first week of training. Each team was given the same test at the conclusion of training as a post-test. Data collected from both groups was analyzed using statistical methods (α =0.05) to assess the impact of high-fidelity simulations on clinical performance compared to traditional observational learning.

Simulation Grading Rubric Template

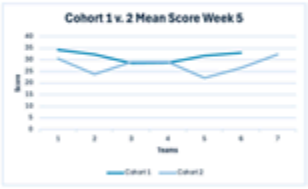


Figure 2: *Cohort Performance Comparison at Week 5 of Training.* This figure illustrates the mean scores of Cohort 1 and Cohort 2 across different teams in the fifth week of training. The team number in each cohort is represented on the X-axis and the mean score is represented on the Y-axis. Cohort 1 consistently achieved higher scores.

Figure 3: *Post-Test Score Comparison Between Cohorts.* This figure represents the average post-test scores for both cohorts after completing the simulation training period. The team number in each cohort is represented on the X-axis and the mean post-test scores is represented on the Y-axis. Teams in Cohort 1 scored significantly higher than those in Cohort 2.

Figure 4. *Cohort 1 Team Scores per Week of Training.* This figure shows the progression of team scores for Cohort 1 across five weeks of training. Each colored line represents a different team. The week of training is demonstrated on the X-axis and the team score for each week is demonstrated on the Y-axis.

Figure 5. *Cohort 2 Team Scores per Week of Training.* This figure shows the progression of team scores for Cohort 2 across five weeks of training. Each colored line represents a different team. The week of training is demonstrated on the X-axis and the team score for each week is demonstrated on the Y-axis.

RESULTS

- 1 team from **Cohort 1** was dropped from data analysis due to team members being lost due to various academic reasons
- **Cohort 1** and Cohort 2 both scored significantly higher on their post-test compared to their pre-test with a p-value of .0006 and .0036, respectively
- **Cohort 1** had a significantly higher mean on the post-test than Cohort 2 with a p-value of 0.0005
- **Cohort 1** and Cohort 2 both significantly increased their mean performance scores for clinical encounters between their first and fifth weeks of training with p-values of .0001 and .0241, respectively
- **Cohort 1** teams scored significantly higher than Cohort 2 in the fifth week of training with a p-value of .0226

Figure 1: Standardized Patient Room Setup in ACOM's Simulation Center. This image shows the high-fidelity simulation environment using SimMan 3G, complete with a hospital bed and monitor setup, used during simulation encounters.

DISCUSSION/CONCLUSION

The results of this study highlight the measurable impact of HFS in medical training. While the value of hands-on learning is widely acknowledged in theory, few studies have directly quantified its advantage over observational learning in structured, competitive, team-based simulation environments. Our findings bridge that gap as our data supports that students who actively engaged in HFS **(Cohort 1)** significantly outperformed those with primarily observational roles (Cohort 2) in both weekly clinical encounter scores and post training assessments (Figures 2 and 3).

These findings indicate that HFS not only sharpens clinical skills but also accelerates the development of essential competencies, as reflected in significant performance gains over time. This reinforces prior research highlighting improvements in aspects of clinical reasoning, including diagnostic justification (Staal et al., 2023).

While both cohorts showed progress (Figures 4 and 5), the significantly greater gains in **Cohort 1** suggest that consistent, experiential learning via HFS produces deeper, more impactful educational outcomes. Thus, these results support the integration of HFS into medical curricula not merely as a supplement, but as a central teaching strategy. Future research with larger sample sizes and longer follow-up will be essential to assess retention and transferability of these skills into real-world clinical performance.

REFERENCES

Meyers, L., Mahoney, B., Schaffernocker, T., Way, D., Winfield, S., Uribe, A., Mavarez-Martinez, A., Palettas, M., & Lipps, J. (2020). The effect of supplemental high fidelity simulation training in medical students. *BMC Medical Education*, 20(1), Article 421. https://doi.org/10.1186/s12909-020-02322-y

Staal, J., Waechter, J., Allen, J., Lee, C. H., & Zwaan, L. (2023). Deliberate practice of diagnostic clinical reasoning reveals low performance and improvement of diagnostic justification in pre-clerkship students. *BMC Medical Education*, 23(1), Article 684. https://doi.org/10.1186/s12909-023-04541-5

Tutticci, N., Theobald, K. A., Ramsbotham, J., & Johnston, S. (2022). Exploring the observer role and clinical reasoning in simulation: A scoping review. *Nurse Education in Practice*, 59, Article 103301. https://doi.org/10.1016/j.nepr.2022.103301

38

Impacts of Medical Education in High School on Healthcare Career Determination

Lucas Goetz, Jessica Linke, Madeline Melanson, Molly Lien, Bailey DeJong, Abbey Rieber, Dr. Jason Kemnitz
[1]The University of South Dakota Sanford School of Medicine

Biography: *Lucas Goetz is a second-year medical student at the University of South Dakota Sanford School of Medicine with strong interests in dermatology, ophthalmology, and rural medicine. He is currently participating in the Frontier and Rural Medicine (FARM) program, a longitudinal rural training experience, where he is currently spending a year providing healthcare in rural Milbank, SD, a town of 3,500 people. Through this program, he is gaining hands-on experience in primary care and specialty services while developing a deeper understanding of the unique healthcare challenges faced by rural populations. In addition to his clinical training, Lucas is actively involved in medical education and ophthalmology research. His primary education-focused project involves teaching high school students fundamental concepts in anatomy, physiology, and pathology, aiming to inspire the next generation of healthcare professionals. He is also conducting research on light-adjustable intraocular lenses (LALs), an innovative technology that allows for postoperative customization of vision correction using UV light, offering new possibilities for personalized refractive outcomes in cataract surgery. Beyond his academic and research pursuits, he serves as a student representative for the National Rural Health Association, advocating for improved healthcare access in underserved areas. In his free time, he enjoys hiking and backpacking, which have strengthened his appreciation for the intersection of nature and medicine.*

Abstract

Background: There is a growing shortage of healthcare workers in the United States, particularly in rural areas. Nearly two-thirds of healthcare provider shortages occur in rural regions, and this deficit is projected to worsen. Recruitment into healthcare careers has become increasingly difficult due to multiple factors, including distrust in the medical system and the financial burden of higher education. Early exposure to healthcare-related topics may play a critical role in fostering interest in these careers. We hypothesize that engaging high school students in structured lessons on anatomy, physiology, and pathology can increase their interest in healthcare professions.

Methods: More than 200 high school students from rural and urban South Dakota were recruited to participate in a semester-long program consisting of weekly lessons on human anatomy, physiology, pathology, and relevant clinical applications. Lessons were tailored to students' interests and delivered both in person and virtually. Pre- and post-program surveys assessed students' interest in healthcare careers and human biology-related topics.

Results: Preliminary data indicate an increase in students expressing interest in healthcare careers by the end of the semester. Additionally, students demonstrated a greater enthusiasm for human body-related topics compared to baseline. While further data collection and analysis are needed, initial findings suggest a positive correlation between structured healthcare education and increased interest in healthcare professions.

Conclusion: This study highlights the potential benefits of incorporating structured healthcare-related education in high school curricula. Schools that lack funding for dedicated anatomy or physiology courses could use these findings to support grant applications and advocate for additional resources. Increasing early exposure to healthcare topics may be a viable strategy for addressing workforce shortages, particularly in rural communities.

Inspiration: Growing up, many future healthcare professionals develop their passion from early experiences, whether through exposure to science, mentorship, or personal medical experiences. This project was inspired by the need to cultivate that passion in rural high school students who may not otherwise have access to healthcare-related education. By making medical topics engaging and accessible, we aim to bridge the gap between curiosity and career aspirations. The broader implications of this research suggest that targeted educational initiatives could play a role in mitigating healthcare workforce shortages, particularly in underserved regions. Ensuring that students, regardless of geography, have the opportunity to explore healthcare careers is essential for the future of medicine.

Curriculum Development and Educational Projects

Poster Snapshot

UNIVERSITY OF SOUTH DAKOTA
SANFORD SCHOOL OF MEDICINE

Impacts of Medical Education in High School on Healthcare Career Determination

Jessica Scheer MS4, Bailey Smith MS3, Molly Lien MS3, Lucas Goetz MS2,
Abbey Rieber MS2, Maddie Melanson MS2, Jason Kemnitz PhD

Background

Shortages of total healthcare workers are predicted to reach 508,930 by 2038. Two-thirds of these shortages are in rural areas, with the deficit only expected to grow. **We predict that if students learn more about the medical field, and topics including anatomy, physiology, and pathology, they will be more likely to pursue a career in healthcare.** Researchers surveyed students before and after either one semester or one year of weekly lessons. Lessons varied in topic but were tailored to fit students' interests and were intended to be relevant and interactive. The current sample size is n = 139.

Goals

- Expose students to information they may not receive until college, if ever.
- Help students become aware of the wide variety of careers within healthcare.
- Increase interest in healthcare, particularly in rural areas, to prevent the projected deficit and decrease the gaps and barriers to care in these areas as a result.
- Provide proof of the benefit of healthcare and anatomy-related education so schools can garner support from school boards and constituents to include it in their curriculums.

Methods

- One-group pretest-posttest (pre-experimental) study design.
  - USD IRB-22-216
- Informed consent was obtained from students and their legal guardian(s).
- Participants included high school students with no prior anatomy knowledge, taking a mandatory class (biology).
- 67 Male students / 69 Female students / 1 Nonbinary student / 2 Other
- Average age: 15 years
- Data Collection and Analysis
  - Pre-surveys assessing interest in healthcare were completed by each participant.
  - Powerpoint lessons created by researchers were presented to the class either in-person or via virtual video conference.
  - The lessons consist of various anatomy, physiology, and pathology topics and included science content, clinical correlations, and interactive activities. Students could request lessons on topics of particular interest to them.
  - Topic examples:
    - Musculoskeletal anatomy
    - Immune system and Autoimmune diseases (MS, Celiac, T1 Diabetes)
    - Viruses, Bacteria, Protists
    - Neurology (Parkinson, Schizophrenia, Dementia)
    - Career Day
  - The lessons were presented during class (40m-1h) on a weekly or bi-weekly schedule at the discretion of the high school class instructor.
  - At the end of the semester, the students completed a post-survey, again assessing their interest in healthcare, and if the class influenced their decision.

Results

Survey Data:
"Have you ever considered going into the healthcare field?

We collected the data above from pre- and post-surveys from 7 classes of students.

"On a scale of 1-10, how do you feel about learning anatomy, 10 being very interested?"

Before: After:

6.56 → 6.68

Student Testimonials:

"This class has changed my opinion on medicine and science, I am more interested in it now and it could be an option for something I want to study in college."

"I liked the fact that we learned things that we have not learned before. This class has extremely changed my opinion on medicine, it made me want to go into the medical field even more."

"I got to learn about anatomy at a younger age when most classes are only for upperclassmen. Also, it was interesting to learn something new each week."

"I enjoyed getting to learn about anatomy and diseases so that when I go to the doctor it will be easier to understand what they are saying and what I can tell them."

"I really enjoyed learning about how the human body works and what's inside of it. This class made me consider joining the medical field when I get older."

Conclusions

- Healthcare worker shortages are projected to increase in the coming years and are a particular problem for rural areas.
- Our initial data shows an increase in the number of students that are considering going into the healthcare field, as well as an increase in students' interest in anatomy after the lessons.
- Providing healthcare-related education to high school students may increase interest in healthcare and help prevent the projected deficit of healthcare workers.
- Our hypothesis could be used to implement anatomy-related curriculum into schools, giving them the proof they may need to advocate for funding and support of this type of curriculum.

References

1.Projecting health workforce supply and demand. *Projecting Health Workforce Supply and Demand | Bureau of Health Workforce* (2023). Available at: https://bhw.hrsa.gov/data-research/projecting-health-workforce-supply-demand.

2.Weinhold, I. & Gurtner, S. Understanding shortages of sufficient health care in rural areas. *Health Policy* 118, 201–214 (2014).

Acknowledgements

Thank you to the communities of Mobridge, Highmore, Aberdeen, Watertown, and Winner for allowing us to contribute to your curriculums.
Thank you to USD SSOM for financial support of this project.

40

Misinformation in the Media: Educating Medical Students about Abusive Head Trauma

Brooke Starn[1], Dr. Vincent Palusci[1]
[1]New York University Grossman SOM

Biography: *Brooke Starn is in her final year of medical school at NYU Grossman School of Medicine. Prior to medical school, she completed her Bachelor of Arts in Human Evolutionary Biology with a minor in Global Health and Health Policy at Harvard University. She then went on to pursue her Master's of Public Health (MPH) at University of California, Davis with emphasis in epidemiology. During her MPH, she researched telehealth implementation in Federally Qualified Health Centers (FQHC) during the COVID-19 pandemic. She also led a quality improvement project at a local FQHC aimed at increasing provider referrals to California's tobacco cessation helpline that saw approximately a 29-fold increase in provider referrals in the first 7 months after the intervention. During medical school, she utilized her Background in epidemiology to research how rates of child abuse, and rates of risk and protective factors for child abuse, changed during the COVID-19 pandemic. Through these experiences, she has found her passion at the intersection of clinical medicine and public health. She will begin her pediatrics residency training in the summer of 2025. In the future, she hopes to work as a primary care pediatrician and with local public health departments to improve the health of children. Outside of medicine, she is an avid runner and road racer. She competes for Central Park Track Club Tracksmith and was awarded New York Road Runners Age Group Runner of the Year for the 2024 road racing season. She also enjoys hiking and attending musical theater performances in New York City.*

Abstract

Background: The Center for Disease Control and Prevention (CDC) defines abusive head trauma (AHT) as "an injury to the skull or intracranial contents of an infant or young child due to inflicted blunt impact and/or violent shaking" (CDC, 2012). Despite recognition by dozens of international professional societies and organizations, AHT has been scrutinized in the popular media, with many denying the legitimacy of the diagnosis. The goal of this project is to educate medical students about AHT and the misinformation being portrayed.

Methods: A 15-minute presentation aimed at correcting common misconceptions in the popular media regarding AHT was integrated into existing child abuse curriculum at NYU Grossman School of Medicine. Students were given the option to complete a survey evaluating their knowledge of the topic prior to and directly after completion of the curriculum. The results of the surveys were analyzed with descriptive statistics and paired t-test analyses. Future iterations of this presentation to additional medical students at NYU are ongoing.

Results: Ten pediatric clerkship students completed both the pre- and post-curriculum surveys. One survey question was removed from analysis due to feedback suggesting lack of clarity. The average score on the pre-presentation survey was 2.1/4, which increased to 3.3/4 on the post survey. Paired t-test analyses demonstrated a significant difference between pre and post test scores with $p<0.05$. Students' written feedback was positive, with students requesting more time and resources to learn about the topic.

Conclusion: A short presentation on AHT misconceptions effectively increased student knowledge. Students also expressed a desire to learn more about this topic, suggesting students may be interested in integrating similar discussions into standard curricula. Limitations of this project include inability to generalize findings to other groups of students at other levels of training due to small sample size consisting of one class of medical students during their pediatric clerkship.

Inspiration: The inspiration for this project originated from reading news articles written by well-respected media outlets that drastically misrepresent the medical acceptance of AHT, which is incredibly dangerous for the safety of children. As the evaluation of AHT requires a multidisciplinary approach, it is imperative that medical students regardless of future specialty are equipped with accurate information. This curriculum also presents an opportunity to provide students with strategies for evaluating the legitimacy of claims in the media, a skill that is imperative for future physicians.

Poster Snapshot

Misinformation in the Media: Educating Medical Students about Abusive Head Trauma

A 15-minute presentation on abusive head trauma misconceptions effectively increased medical student knowledge.

Department of Pediatrics

Brooke Starn and Dr. Vincent Palusci, MD, MS, FAAP

Contact:
Brooke.Starn@nyulangone.org

NYU Grossman School of Medicine

Background:

Abusive Head Trauma (AHT) is defined as "an injury to the skull or intracranial contents of an infant or young child due to inflicted blunt impact and/or violent shaking."[1] AHT is recognized by dozens of professional societies and organizations.[2] Despite this, popular media has perpetuated misinformation regarding AHT for several years, with renewed scrutiny in the summer and fall of 2024.[3,4,5] Our goal is to educate medical students about the misinformation in the media and equip them with accurate information regarding AHT.

Methods:

We created and presented a 15-minute curriculum for pediatric clerkship students at NYU Grossman School of Medicine reviewing and correcting common misconceptions presented in the popular media. This curriculum was presented in conjunction with an existing lecture on child abuse pediatrics, which included an overview of AHT. Students were given the option to participate in pre/post surveys to ensure learning objectives of the curriculum were met, and to gather feedback on the presentation, as part of a quality improvement initiative. Surveys were analyzed with descriptive statistics and paired t-test analyses. Only students who completed both pre and post surveys were included in the analysis. One survey question was removed from final analysis due to feedback suggesting the question lacked clarity. Future iterations to additional groups of medical students at NYU are ongoing.

Table 1:

Question Topic	Percentage correct on pre-presentation survey	Percentage correct on post-presentation survey
General Media Accuracy	100%	100%
AHT myths	0%	40%
AHT epidemiology	80%	100%
AHT differential diagnosis *	30%	90%

Table 1 shows student responses by question topic. Represents a significant difference on McNemar's test with p<0.05.*

Survey:

1. TRUE or FALSE: News media always present accurate medical information about the science of AHT.
2. Which of the following are true? Select all that apply
   - A. The quantity, location, and characteristics of retinal hemorrhages are important to note when considering AHT on a differential diagnosis.
   - B. Many AHT cases have been overturned in recent years, corresponding with misinformation being presented in the popular media.
   - C. The forces required to cause neurologic impairment through shaking an infant would also cause damage to the infant's spine.
   - D. Biomechanics studies can accurately replicate an infant's head and neck, and consistently demonstrate that shaking can cause the pattern of injuries generally seen in AHT.
   - E. Injuries from AHT are devastating for both patients and families.
3. ** TRUE or FALSE: Abusive head trauma presents in a clearly defined manner which is distinct from accidental head trauma.
4. TRUE or FALSE: Death from a short distance fall is exceedingly rare, occurring in less than 1 / 1,000,000 children under 5yo, while AHT occurs in roughly 30 / 100,000 infants under 1yo.
5. Which of the following are often (**incorrectly**) used to explain findings concerning for AHT? Select all that apply.
   - A. Rebleeding from birth trauma
   - B. Vaccinations
   - C. Severe coughing
   - D. Cerebral Sinovenous Thrombosis

** Removed from final analysis.

Figure 1:

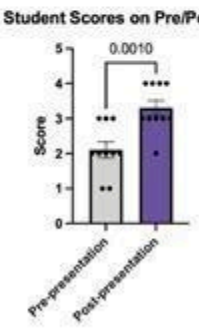


Figure 1 shows the average student scores on pre-presentation and post-presentation surveys. Paired t-test analysis yielded a p-value of 0.001.

Figure 2:

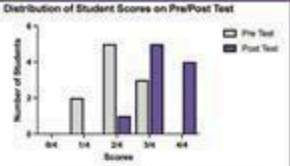


Figure 2 shows the distribution of student scores on pre-presentation and post-presentation surveys.

Results:

Twelve clerkship students attended the initial presentation; 10 of those students completed both the pre- and post-presentation surveys.

The average score on the pre-presentation survey was 2.09/4. The average score on the post-presentation survey was 3.33/4, leading to an average score increase of 1.3. Paired t-test analysis yielded a p-value of <0.05.

Students' written feedback was positive, with students requesting more time or resources to learn about this topic in greater depth.

Conclusion:

In our small sample of students, a short introductory presentation about the misinformation in the popular media regarding AHT was an effective means of increasing student knowledge as demonstrated by an increase in scores on a knowledge test after the presentation. Students also expressed a desire to learn more about this topic, suggesting students may be interested in integrating similar discussions into standard curricula. Limitations of this project include inability to generalize findings to other groups of students due to small sample size consisting of one class of medical students.

References:

42

Pilot Study: Elevating Medical Students' Skills and Self Efficacy in Surgical Clerkship through Near Peer Teaching

Emily Major[1], Dr. Jennifer Brueckner-Collins, Mr. Ryan Cantrell, Ms. Michaela Dukes, Mr. Mohammad Abou El-Ezz, Mr. Cameron Stephens, Mr. John Davis, Mr. Grayson Stinger
[1]University of Louisville SOM

Biography: *Emily is a third-year medical student at the University of Louisville School of Medicine. She is a first-generation student from Lancaster, Kentucky. She completed her undergraduate education at University of Kentucky and earned a Bachelors of Science degree in Agricultural and Medical Biotechnology. She was then accepted to a competitive joint-fellowship between the National Cancer Institute and Johns Hopkins University, where she conducted cancer research under the supervision of Udo Rudloff, MD, PhD and earned a Masters of Science in Biotechnology. She is passionate about women's health, cancer care, and medical education.*

Abstract

Background: Near Peer Teaching (NPT) is a teaching method in which a student who is slightly more advanced in a particular field teaches their peers. This study aims to evaluate the impact of a surgical skills clinic on medical students' surgical skills and confidence in a surgical setting through both quantitative and qualitative measures.

Methods: Pre- and post-survey data was collected from 35 second-year medical students at a single institution who participated in a four-week surgical skills clinic between late 2023 and early 2024. Both pre- and post-surveys were completed by 83% of participants. Near Peer teachers were defined as six students who had completed over 40 hours of one-on-one instruction with a renowned plastic surgeon. Paired sample t-tests were conducted to evaluate the impact of the surgical skills clinic on these responses, and Cohen's D was calculated to assess effect size.

Results: Quantitative analysis revealed significant improvements across all metrics with large effect sizes in nine areas (range of Cohen's D=1.55 to 3.43, $p<.001$) and a moderate effect size in interest in pursuing a surgical specialty (Cohen's D=.56, p=.006). Qualitative analysis of survey responses identified persistent themes of fear of contamination, lack of experience and confidence, responsibility for patient safety, desire for skill improvement, and need for clarity and guidance.

Conclusion: Surgical skills clinic significantly improved participants' suturing skills and self-confidence. Participants reported a desire to continue practicing surgical skills. Persistent themes emerged regarding concerns about contamination and maintaining sterile fields. Future research could assess participants' skill retention and their decisions regarding surgical residencies.

Inspiration: Anne and Dr. Morton Kasdan's Surgical Skills Clinic has provided medical students at the University of Louisville with the opportunity to develop essential surgical skills, including proper suturing techniques. For over 20 years, the Kasdans have generously hosted this program in their home at no cost, benefiting undergraduate medical students. The authors of this project have heard anecdotally about the significant impact the clinic has had on students, including improved performance in clerkships and acting internships, as well as a heightened interest in pursuing surgical specialties. This project aims to capture and quantify the clinic's impact on students' technical skills and overall success. The authors hope that this data will contribute a unique perspective to the growing body of literature advocating for the inclusion of formal curricula focused on developing students' clinical skills and performance.

Curriculum Development and Service Projects

44

Rethinking Medical Education in Uncertain Times: Preparing Future Doctors with Less Debt, Stress and Time Without Compromising Patient Care

Ankit Jain[1]
[1]Lake Erie College of Osteopathic Medicine, Seton Hill Campus

Biography: *Ankit Jain is a second year medical student at Lake Erie College of Osteopathic Medicine at Seton Hill in Greensburg, PA. Prior to beginning medical school Ankit obtained a masters in Electrical Engineering from Penn State University, worked in the technology sector for six years and in clinical research in Psychiatry at Northwestern University for six years. Ankit is passionate about providing comprehensive physical and mental health care to patients.*

Abstract

Background: Medical education is a long and arduous route and takes an average of 9-15 years of education which includes three to four years of undergraduate, three to four years of medical school and three to seven years of residency. To address this shortage, we have come up with solutions of creating three-year medical schools, starting tracks for physician assistants/associates and nurse practitioners. However, there is still a shortage of doctors and there is concern about independent scope of practice of non-physician providers could potentially harm patient care. Given the current political climate and attacks on education, research and Medicaid in a short time span of less than two months and uncertainty about Medicare and residency slots. It is imperative we plan and come up with solutions so as to not hurt patient care and exacerbate health care disparities.

Methods: We looked at current American Medical Association priorities for advocacy and current administrative actions set forth by the current administration and focused on something which could be tackled from that list. The topic on promoting physician-led care in the advocacy efforts and addressing the current attacks on education, research, and Medicaid by the current administration stood out. We looked at the state of medical education across the world.

Results: Medical education around the world starts after completing high school and students obtain a Bachelor of Medicine and Bachelor of Surgery (MBBS) within five years. If the United States was to adapt such a model and work further on optimizing aspects of medical education this time for training could be optimized. Furthermore, right across our Northern Border the country of Canada produces family physicians within just two years of residency training. If we were to implement such a model, we could potentially produce generalists in less than 7 years without compromising patient care which is at risk with reduced training of advanced practice providers. We need to do right by patients and still keep the spending in check.

Conclusion: Through a simple approach of starting medical education earlier, we could potentially produce family physicians in a shorter amount of time with a less student loan burden. This could potentially help alleviate burnout because of reduced training time and lowered total student loan burden.

Inspiration: This project rose out of fears of attack on education, Medicaid, healthcare by the current administration which could further exacerbate health disparities and impact access to care.

Curriculum Development and Educational Projects

Poster Snapshot

Rethinking Medical Education in Uncertain Times

Preparing Future Physicians with Less Debt, Stress and Time Without Compromising Patient Care

Ankit Jain[1], MS, OMS-2
[1]Lake Erie College of Osteopathic Medicine, Greensburg, PA 15601

MEDICAL EDUCATION AND PATIENT CARE IS UNDER THREAT!

The Republican House Budget Resolution's Potential $880 Billion in Medicaid Cuts by Congressional District

4 years undergraduate + 1 average gap year+ 4 years medical school + 3 years of residency = **~ 12 years** to prepare a generalist.

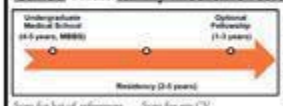
Average **undergraduate debt** at medical school matriculation **~ $25, 000**
Average total **Medical Graduate Debt: ~ $250,000**
There is an **urgent** need to optimize medical training.

Federal Agency Dedicated to Mental Illness and Addiction Faces Huge Cuts

Current approaches of **3-year medical schools** by Consortium of Accelerated Medical Pathway Programs (CAMPP) does not go far enough. Additionally, with current administration's focus on cutting spending at the cost of welfare of patients' there is a risk that they could propose replacing the physician workforce with PAs and NPs and provide them unsupervised, unrestricted practice rights putting patient safety at risk.

PLANNING AHEAD: LOOKING AT REST OF THE WORLD

The rest of the world offers **Bachelor of Medicine, Bachelor of Surgery (MBBS)** which can be completed in approximately **five years**. Many **post baccalaureate pre-medicine programs** are **one year** long, and new medical schools offer **three-year tracks** meaning medical students could graduate medical school with adequate relevant training in a total of **four years after high school**. Additionally, our northern bordering country **Canda** offers **family medicine residency** programs which can be completed in just **two years**.



Even assuming 5 years of MBBS which is standard across the world and 2 years of Family Medicine Residency it ends up being 7 years of training. That means one can become a primary care physician in about seven years versus twelve years with a **total saving of five years of tuition fee, government loans, living expenses.** Lowering training time could also lead to lower burn out rates and address barriers for people wanting to pursue medicine who are dissuaded by longer training times as it could impact family planning. The Dialectical Behavioral Therapy (DBT) concept of dialectics applies here. We can reduce costs and deliver excellent patient care without comprising quality.

50

Training for impact: a universal approach to using medical interpreters in healthcare

Michael Benavidez[1], Daniela Gonzalez[1], Haleigh Stein[1], Alyssa McMandon[1], Elisabeth Caldwell[1], Katerine Molina
[1]Edward Via College of Osteopathic Medicine Carolinas Campus

Biography: *Michael S. Benavidez's educational path commenced at City College of New York, where he earned his Bachelor's degree in Biochemistry in 2017. His early academic foundation instilled in him a passion for understanding the complexities of life at a molecular level. During his undergraduate years, Michael actively engaged in the field of organic chemistry fluorination and embraced a role as a lecture adjunct. In 2021, Michael S. Benavidez achieved another milestone in his academic journey, earning a master's degree at Bluefield University. Today, Michael stands before us as a third-year osteopathic medical student at VCOM-Carolinas medical school, pursuing a general surgery residency. This intersection of his knowledge in the life sciences and his passion for medicine reflects his dedication to an interdisciplinary approach to healthcare.*

Abstract

Background: Effective communication between doctors and patients who have limited English proficiency (LEP) presents additional challenges. However, using an interpreter is essential to bridge these gaps, ensuring clear mutual understanding between physician and patient. This research project aims to develop and evaluate a training module that works across four types of interpreting services: in-person, phone, video call (all certified), and non-certified in-person. The goal is to enhance communication between healthcare providers and non-English-speaking patients, ultimately reducing the effects of language barriers on patient care.

Methods: The study employs a pre- and post- module training assessment involving medical students. Participants are randomly assigned to a patient encounter having one of the four interpreter services simulations: in-person, phone, video call (all certified), and non-certified in-person. After the encounter, participants completed the training module and returned to conduct a second patient encounter with the same interpreter simulation as the one randomly assigned at the beginning. Encounters are recorded and assessed on a grading scale rubric. Each interpreter modality requires a minimum of 15-20 participants to achieve a sample size with sufficient statistical power.

Results: Four different rubrics were developed based on current guidelines and a review of the literature. These rubrics combine scale grading and pass/fail grading styles. Video samples included in the training module, demonstrate the proper use of various medical interpreter modalities for students to reference. Although the research has not yet been conducted, it is expected that the training module significantly improves medical interpreter use, enhancing communication and interaction between medical students and standardized patients with LEP.

Conclusion: Comprehensive training in interpreter modalities enhances physician-patient communication. Providing this training to medical students could better equip a new generation of physicians to overcome the specific challenges associated with treating patients who face language barriers, thus improving healthcare outcomes.

Inspiration: My passion for this project is driven by the critical need for effective communication in healthcare, especially for patients with LEP. Clear communication is not just about delivering care but about ensuring care is understood. Inspired by figures like Dr. Ildaura Rodríguez-Trias, who advocated for marginalized communities, and Dr. Jane Delgado, who promoted language accessibility, we aim to extend their legacy. Our goal is to ensure that no patient's health outcomes are compromised by language barriers. This commitment to improving interpreter services in medical settings promises a future where all patients, regardless of language proficiency, have equitable access to quality healthcare.

Curriculum Development and Educational Projects

Poster Snapshot

Training for Impact: Universal Approach to Using Medical Interpreters in Healthcare

2025 AMSA ANNUAL CONVENTION
April 17-19, ARLINGTON, VA

Michael Benavidez Arias, MA, OMS-III; Daniela Gonzalez, OMS-II; Alyssa McMandon, OMS-III; Haleigh Stein, MS, OMS-III; Elisabeth Caldwell, OMS-I; Katerine Molina, OMS-I; Stacey Stokes, HSOS; Michael Parks, MPA; Tom Lindsey, DO.
Edward Via College of Osteopathic Medicine, Simulation Center, Spartanburg, SC.

Introduction

Background: Good communication between physicians and patients can help patient health by improving understanding, reducing stress, and boosting compliance.[1,2] This type of communication is an essential building block for informed consent and decision-making by the patient. On the contrary, ineffective communication by physicians often leads to patient dissatisfaction and poor outcomes.

Challenges: Effective communication between physicians and LEP patients presents significant challenges. Utilizing an interpreter is essential to bridge these gaps and enhance the communication loop, ensuring that both physician and patient understand each other clearly **(Fig 1).** Currently, most interpreter usage educational modules are focused on educating the interpreter instead of the physician. Notably, there is very little focus on educating medical students on correct interpreter usage across different interpreter modalities.

Study purpose: To evaluate the effectiveness of a training module for medical students on the proper use of a certified interpreter whether in-person, by telephone, through a tablet, or with a non-certified interpreter to improve physician-patient encounters.

Figure 1. Dynamics of the Communication Cycle
Effective communication is either verbal or non-verbal speech to rely information to get a point across to another individual. The sender is the person conveying the message, while the receiver is the person receiving the information the sender is conveying.

Experimental Design

1. Patient encounter with low proficiency in English patient without interpreter training usage
2. Study subjects complete the training module
3. Patient encounter with low proficiency English patient
4. Pre- and Post-module training assessed following a rubric to identify statistical significance in improvements of interpreter usage

Results

Module content

- The module contains how to use the four different interpreter modalities, including a certified interpreter in-person, telephone, or via tablet, or using an uncertified interpreter.
- The module encompasses all the necessary current recommendations based on a review of literature.
- The module will also include video demonstrations and quiz assessments **(Fig. 2).**

Figure 2. Video demonstration
Video demonstration incorporated within the module that demonstrates correct usage of an in-person certified interpreter

Student grading rubric

- There are four separate rubrics that include the use of certified in-person interpreters, telephone, tablet, and non-certified interpreters **(Table 1).** These rubric were created based on retrospective literature reviews.
- The rubric will be graded according to the simulation that is randomly assigned to the study participant.
- The rubric is a structured evaluation of the recommended guidelines for interpreter use and is quantified using either yes or no format or a scoring system.

Table 1. Rubric Sample for Grading Participants in the Use of Interpreters

	Does Not Meet 1 pts	Partially Meets 2 pts	Meets 3 pts	Exceeds 4 pts
Non-verbal communication	Spoke only to the interpreter, not directly to the patient.	Spoke directly to both the patient and interpreter around 50% of the time and used a normal tone voice.	Around 75% of the time during the patient encounter, the participant spoke directly to the patient using a normal tone voice.	Always faced and spoke directly to the patient in a normal tone voice.
Verbal Communication with patient	Directed all questions or inquiries to the interpreter, not to the patient.	Directed most questions or inquiries to the interpreter, and some towards the patient.	Directed most questions or inquiries to the patient, and some towards the interpreter.	Directed all questions or inquiries to the patient and never to the interpreter.
Verbal communication with interpreter	Never paused between sentences, not allowing the interpreter sufficient time to translate.	Rarely paused between sentences so that the interpreter can interpret/give interpreter ample time to interpret before continuing.	Paused every 4-5 sentences so the interpreter can interpret/give interpreter ample time to interpret before continuing.	Paused every 2-3 sentences so the interpreter can interpret/give interpreter ample time to interpret before continuing.
Correct first person communication	Failed to use first-person communication with the patient via the interpreter.	For about half of the encounter used first-person communication with the patient through the interpreter.	For most of the encounter used first-person communication with the patient using an interpreter.	Always used the first person when communicating with the patient using an interpreter.

Scoring system assessing correct interpreter use, with 4 being the highest adherence to the guidelines

Conclusion

- We determined the importance of implementing an interpreter training module based on the 2020 census, which reported that approximately 8.3% of the US population, which is equivalent to 27 million people, indicated that they did not speak English "very well".[3] Given this, providing training to medical students could better prepare a new generation of physicians to mitigate barriers to equitable access.
- Currently, there is no training module available that has proven to significantly improve correct interpreter usage according to approved guidelines.
- Additionally, our research indicates a lack of a single, comprehensive guideline that covers all approved protocols for interpreter usage.

Expected Outcomes

Future Plans:

- We aim to expand the accessibility of this module to other medical schools and hospitals for broader training purposes.
- Additionally, we plan to ensure the module remains flexible and can be updated regularly to reflect ongoing advancements in research on the use of various interpreter styles.

Research Grant:
We are currently applying for the VCOM SEED Research Grant to hire certified interpreters for the four different simulations as well as recruit actors to portray patients and trainers to prepare them for the simulations.

References:
1. Mohd Salim NA, Roslan NS, Hod R, Zakaria SF, Adam SK. Exploring Critical Components of Physician-Patient Communication: A Qualitative Study of Lay and Professional Perspectives. Healthcare (Basel). 2023 Jan 5;11(2):163.
2. Jonathan Silverman, Paul Kinnersley. British Journal of General Practice 2010; 60 (571): 76-78
3. Bureau, U. S. (2024, February 26). American Community Survey (ACS). Census.gov

Acknowledgements:
This project was supported by Edward Via College of Osteopathic Medicine-Carolinas Campus and funded by the Simulation Center

52

Visual arts and humanities in medical education

Lauren Schild[1], Craig Uthe[1,2]
[1]The University of South Dakota Sanford SOM, [2]Sanford Health

Biography: *Lauren is a 3rd year medical student from South Dakota. She completed her undergraduate education at the University of South Dakota, graduating summa cum laude and earning a BS in medical biology with minors in art, math, and chemistry.*

Abstract

Background: In medicine today, physicians are expected to be impartial, emotionally intelligent, and have the observational skills to pick up on ambiguous body language, skin changes, and hygiene factors which may aid in a diagnosis. However, many physicians experience fatigue or burnout, which impacts their observations and their tolerance of ambiguity. Art has historically been used by the artist to express thoughts and emotions for themselves and to allow viewers to explore their own feelings.

Methods: The course consists of eight, two-hour sessions during which students will have the opportunity to evaluate and discuss an artwork individually and as a class and the opportunity to experience creating works using a variety of mediums. A short pre/post-course written assessment in which students evaluate an artwork will be used to track changes in observational analyses, and weekly post-session surveys will be used to assess the administration of the session. Subjective data from the written assessment will be quantified into descriptive or interpretive categories.

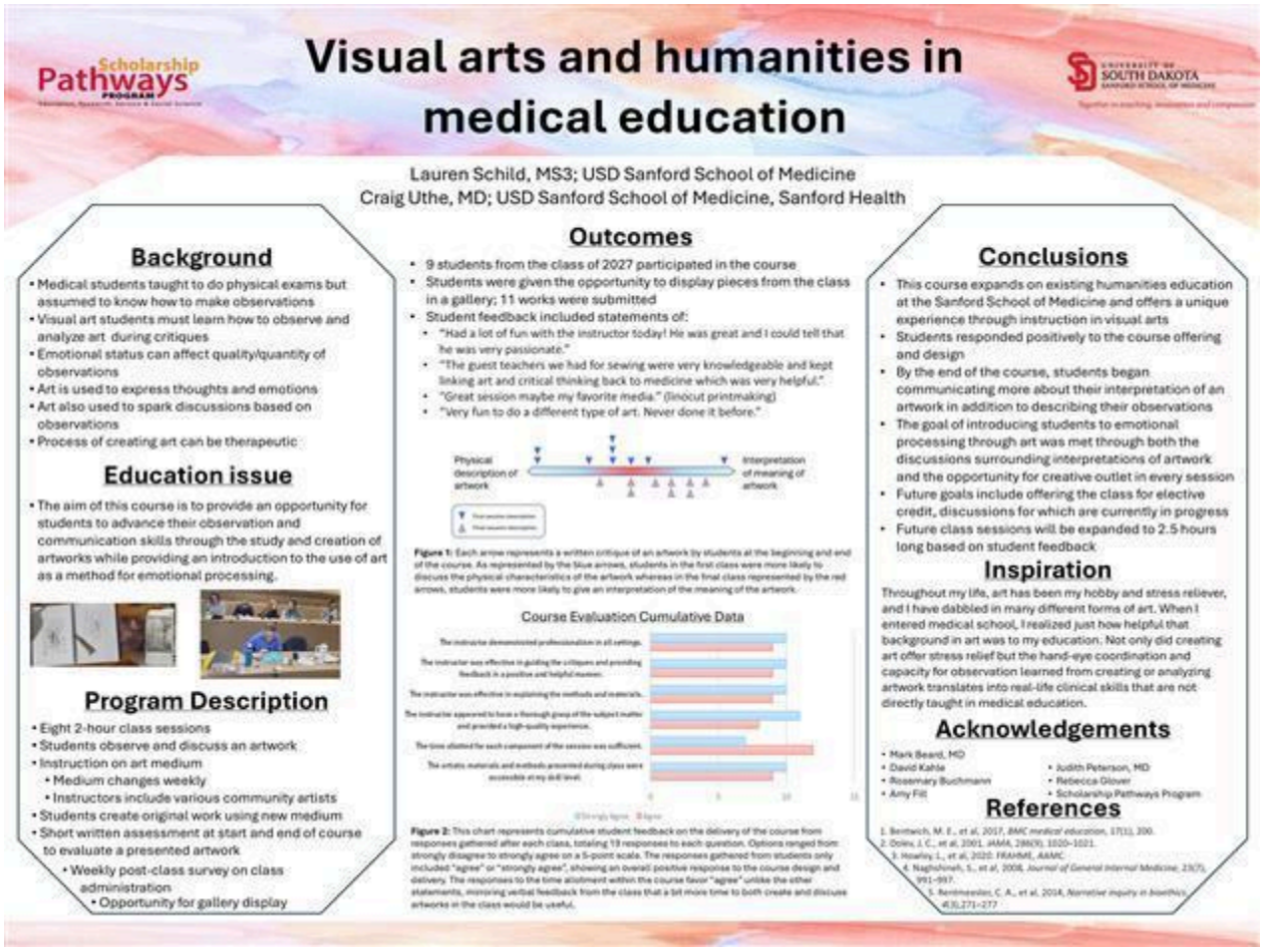
Results: A written pre-course and post-course assessment was obtained from all nine participants, revealing a change in tendency from describing the physical aspects of an artwork to discussing an interpretation of the meanings of an artwork. Students also completed evaluations of the weekly sessions and responses to questions of time management, quality of instruction, and quality of instructors ranged from “agree” to “strongly agree”. Written feedback of the course was positive overall and offered the suggestion of extending the session length to allow more time for discussions and creation of artworks.

Conclusion: The course expands on existing humanities education at the school and meets all educational goals set forth while receiving positive feedback from students. Future goals for the course include offering the course for credit as an elective for first-year medical students and adapting to student feedback by extending each session length to 2.5 hours.

Inspiration: Throughout my life, art has been my hobby and stress reliever. I have dabbled in many different forms of art including drawing, painting, sculpture, pottery, film photography, installation art, and many more. When I entered medical school, I realized just how helpful that background in art was to my education. Not only did creating art offer stress relief but the hand-eye coordination and capacity for observation learned from creating or analyzing artwork translates into real-life clinical skills that are not directly taught in medical education.

Curriculum Development and Educational Projects

Poster Snapshot



Visual arts and humanities in medical education

Lauren Schild, MS3; USD Sanford School of Medicine
Craig Uthe, MD; USD Sanford School of Medicine, Sanford Health

Background

- Medical students taught to do physical exams but assumed to know how to make observations
- Visual art students must learn how to observe and analyze art during critiques
- Emotional status can affect quality/quantity of observations
- Art is used to express thoughts and emotions
- Art also used to spark discussions based on observations
- Process of creating art can be therapeutic

Education issue

- The aim of this course is to provide an opportunity for students to advance their observation and communication skills through the study and creation of artworks while providing an introduction to the use of art as a method for emotional processing.

Program Description

- Eight 2-hour class sessions
- Students observe and discuss an artwork
- Instruction on art medium
  - Medium changes weekly
  - Instructors include various community artists
- Students create original work using new medium
- Short written assessment at start and end of course to evaluate a presented artwork
  - Weekly post-class survey on class administration
  - Opportunity for gallery display

Outcomes

- 9 students from the class of 2027 participated in the course
- Students were given the opportunity to display pieces from the class in a gallery; 11 works were submitted
- Student feedback included statements of:
  - "Had a lot of fun with the instructor today! He was great and I could tell that he was very passionate."
  - "The guest teachers we had for sewing were very knowledgeable and kept linking art and critical thinking back to medicine which was very helpful."
  - "Great session maybe my favorite media." (linocut printmaking)
  - "Very fun to do a different type of art. Never done it before."

Figure 1: Each arrow represents a written critique of an artwork by students at the beginning and end of the course. As represented by the blue arrows, students in the first class were more likely to discuss the physical characteristics of the artwork whereas in the final class represented by the red arrows, students were more likely to give an interpretation of the meaning of the artwork.

Figure 2: This chart represents cumulative student feedback on the delivery of the course from responses gathered after each class, totaling 19 responses to each question. Options ranged from strongly disagree to strongly agree on a 5-point scale. The responses gathered from students only included "agree" or "strongly agree", showing an overall positive response to the course design and delivery. The responses to the time allotment within the course favor "agree" unlike the other statements, mirroring verbal feedback from the class that a bit more time to both create and discuss artworks in the class would be useful.

Conclusions

- This course expands on existing humanities education at the Sanford School of Medicine and offers a unique experience through instruction in visual arts
- Students responded positively to the course offering and design
- By the end of the course, students began communicating more about their interpretation of an artwork in addition to describing their observations
- The goal of introducing students to emotional processing through art was met through both the discussions surrounding interpretations of artwork and the opportunity for creative outlet in every session
- Future goals include offering the class for elective credit, discussions for which are currently in progress
- Future class sessions will be expanded to 2.5 hours long based on student feedback

Inspiration

Throughout my life, art has been my hobby and stress reliever, and I have dabbled in many different forms of art. When I entered medical school, I realized just how helpful that background in art was to my education. Not only did creating art offer stress relief but the hand-eye coordination and capacity for observation learned from creating or analyzing artwork translates into real-life clinical skills that are not directly taught in medical education.

Acknowledgements

- Mark Beard, MD
- David Kahle
- Rosemary Buchmann
- Amy Fitt
- Judith Peterson, MD
- Rebecca Glover
- Scholarship Pathways Program

References

1. Bentwich, M. E., et al. 2017. *BMC medical education*, 17(1), 200.
2. Dolev, J. C., et al. 2001. *AMA*, 286(9), 1020–1021.
3. Howley, L., et al. 2020. *FRAMME, AAMC*.
4. Naghshineh, S., et al. 2008. *Journal of General Internal Medicine*, 23(7), 991–997.
5. Reimeweiler, C. A., et al. 2014. *Narrative inquiry in bioethics*, 4(3), 271–277.

GLOBAL
AUTOIMMUNE
INSTITUTE
PROJECTS

54

Unseen and Undiagnosed: Addressing Diagnostic Delays and Health Disparities in Lupus Among African American Men

Mrs. Sanika Joshi, Ms. Hope Fardanesh
[1]Midwestern University - Arizona College of Osteopathic Medicine

Biography: Sanika is a third-year medical student who graduated with honors in Public Health from UC Irvine. She is deeply passionate about advancing public health and addressing health disparities. With aspirations of becoming an internal medicine physician, Sanika is dedicated to advocating for patients from all backgrounds, striving to improve healthcare access and outcomes for underserved communities.

Abstract

Background: This project explores the challenges surrounding the diagnosis of Systemic Lupus Erythematosus in African American men, a population that is often underrepresented in lupus research. The primary issue being addressed is the delayed diagnosis and misdiagnosis of lupus in this group due to a lack of awareness, healthcare disparities, and potential biases in the clinical setting. The project aims to highlight the intersection of race and gender in the diagnostic process, with a mission to advocate for more equitable care and timely diagnosis for African American men with Lupus.

Methods: This research will take the form of a systematic literature review to gather existing data on lupus in African American men and the health disparities they face. The target population includes African American men diagnosed with lupus, with a focus on diagnostic delays, misdiagnosis, and treatment challenges specific to this group. PubMed, Medline, and Cochrane databases will be utilized to identify studies using relevant search terms like "Lupus in African American men," "racial disparities in Lupus diagnosis," and "gender and autoimmune diseases." The articles will be evaluated to identify common themes, trends, and knowledge gaps.

Results: Early findings suggest that African American men are often diagnosed later than other groups, with some individuals experiencing delays of 1 to 5 years due to misdiagnosis or failure to recognize lupus symptoms. This delay is compounded by racial biases and gender stereotypes, leading to a longer wait for proper treatment and worse health outcomes. Preliminary data from literature indicates a lack of awareness among healthcare providers regarding how lupus presents in African American men.

Conclusion: The results underscore the significant health inequities experienced by African American men with lupus, particularly regarding delayed diagnoses and inadequate healthcare access. The findings suggest that improving medical education on lupus in racially diverse populations and addressing gender-based diagnostic biases are critical to improving health outcomes for African American men with lupus.

Inspiration: The inspiration for this project stems from a deep commitment to addressing health disparities and improving outcomes for populations that are often overlooked in medical research, especially when it comes to lupus. African American men with lupus are frequently diagnosed later than others, contributing to more severe health outcomes. By addressing this issue, I hope to advocate for better diagnostic practices, raise awareness about the gendered and racial components of autoimmune diseases, and contribute to a more inclusive healthcare system.

Global Autoimmune Institute Projects

INTERNATIONAL
IMPACT
PROJECTS

55

A systematic review of effective strategies for breast cancer screening in low-resource settings

Dr. Ramin Asgary[2], **Hunter Anderson**[1,2]
[1]Wright State University Boonshoft School of Medicine, [2]George Washington University - Milken Institute School of Public Health

Biography: *Hunter was born and raised on a small horse ranch in rural Colorado. Growing up in a small town taught him the importance of being a part of a community, to grow deep relationships, and to make a lasting impact on the surrounding areas. Hunter is also a humanitarian. He has provided humanitarian aid in different scenarios in Chile, Guatemala, Nepal, Mexico, The Dominican Republic, India, and Kyrgyzstan. Hunter received his first master's degree from George Washington University in Humanitarian Health, and a second master's degree in Biophysics and Physiology from Georgetown University. Passionate about healthcare and service to others, Hunter recently embarked on his lifelong dream of becoming a Doctor. He is a current First Year Medical Student at Wright State University Boonshoft School of Medicine. Beyond academic endeavors he is married to the love of his life Hannah, and recently welcomed a baby girl into his family, Josie. Hunter is excited to join the healthcare workforce and to make a positive impact in the future communities he will serve.*

Abstract

Background: Breast cancer poses significant global health challenges, especially in low-resource settings (LRSs), where limited access to breast cancer screening (BCS) strategies often result in poor outcomes. While mammography is the gold standard for BCS, due to its high cost and limited accessibility in low- and middle-income countries (LMICs) hinders implementation. Alternative screening methods such as breast ultrasound (BUS), breast exams (CBE), and breast self-exams (BSE) have been introduced in LRSs.

Methods: We performed a systematic review of literature in MEDLINE/PubMed, Web of Science, Psych Info, Anthropology Plus, EMBASE, DARE, Cochrane Library, Scopus, WHO Global Health Library, Google Scholar, other grey literature and INGOs websites (MSF, IRC, CARE, Mercy Corp, IMC), and public health, medical and tropical medicine conferences to evaluate effective strategies for breast cancer screening in LMICs defined by World Bank. Two reviewers independently conducted reviews of included articles. Final articles were qualitatively assessed using a standardized data extraction tool. Finally, a critical appraisal of final articles using JBI to ensure quality was conducted.

Results: Initial search yielded 4029 studies; 43 articles were included in the final review. Studies were from 5 of the 6 WHO classification regions; the majority were from Africa region, followed by the Americas and South-East Asia. Mammography remains low in LMIC contexts due to the overall lack of diagnostic capabilities and infrastructure. The majority interventions were CBE and BSE with variable specificity and sensitivity among different populations. More than 50% of positively diagnosed cases of breast cancer in LMICs are diagnosed in later stages resulting in higher mortality and lower life expectancy. The widespread utilization of CBEs and BSE in LMICs reflects the necessity to adapt breast cancer screening strategies to the local context, ensuring that women in these settings have access to essential healthcare services for the timely detection and management of breast cancer.

Conclusion: This comprehensive systematic review considers CBE as a cost-effective alternative in LRS, as shown by the highlighted outcomes. However, for a better understanding of effective screening, additional trials comparing mammography, US, CBE, and BSE are essential.

Inspiration: I am passionate about Global Health and serving the world's most vulnerable populations. This comprehensive project has deepened that passion by allowing me to conduct research that can drive positive change on a global scale. By highlighting effective breast cancer screening strategies in low-resource settings, this work can help inform screening initiatives, enhance diagnostic capabilities, and promote earlier detection.

International Impact Projects

56

Episiotomy Practices in the Dominican Republic: A Call for Change

Paria Remolina[1], Angel Mendoza Barrera, Zeta Acosta
[1]Universidad Nacional Pedro Henriquez Ureña

Biography: *Paria Remolina is a final-year medical student at Universidad Nacional Pedro Henríquez Ureña in the Dominican Republic, with a deep interest in surgery and patient-centered care. Passionate about exploring Dominican culture, Paria is committed to promoting empathetic care for all patients from every member of the healthcare team.*

Abstract

Introduction: Episiotomy has been used worldwide since the mid-19th century to facilitate childbirth by enlarging the vaginal canal. Episiotomy is a procedure that is decreasing in practice but remains prevalent in some parts of the world. This study examines the episiotomy rate in the Dominican Republic and explores factors influencing its application.

Methods: A retrospective study was conducted between April and May 2024, focusing on 161 women who underwent vaginal delivery at a public hospital in the Dominican Republic. Data was collected from medical records to document episiotomies. Additional information was also recorded, including newborn weight in grams, maternal nationality, and maternal age. This approach provided a comprehensive view of the factors associated with episiotomy use.

Results: Among the 161 patients, there was a 39% [63/161] episiotomy rate. Of those who underwent the procedure, 35% [22/63] were Haitian, and 65% [41/63] were Dominican. The mean age of mothers who received episiotomies was 23 years old, with a mean newborn weight of 2,981 grams. In this study, the mean newborn birth weight was 2,981 grams in the episiotomy group and 3,003 grams in the non-episiotomy group, indicating that birth weight was not a significant factor in the decision to perform an episiotomy.

Conclusion: The study identified a high episiotomy rate unrelated to maternal age, nationality, age, or birth weight, suggesting that other factors may influence the decision to perform episiotomies. These findings highlight the need to reevaluate episiotomy practices in public hospitals in the Dominican Republic, aligning with global standards to improve maternal outcomes.

Inspiration: The inspiration for this study is the commitment to improving maternal care in the Dominican Republic, where childbirth practices significantly impact women's health. Despite global recommendations favoring selective use, the high episiotomy rate reflects an urgent need for evidence-based change. This research highlights current practices and promotes safer, patient-centered maternity care, ensuring better outcomes for mothers and newborns. Mothers are the foundation of families and society, and protecting their health is essential to fostering strong communities. This work aligns with the global movement advocating for respectful maternity care, empowering women with safer, evidence-driven childbirth practices for the future.

International Impact Projects

Poster Snapshot

EPISIOTOMY PRACTICES IN THE DOMINICAN REPUBLIC: A CALL FOR CHANGE

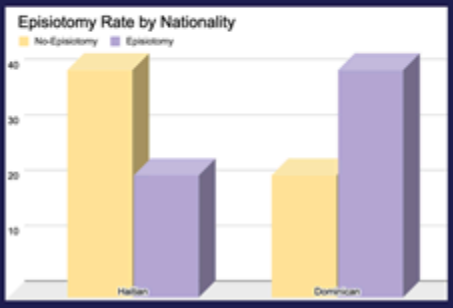
Paria Remolina, Angel Creciano Mendoza Barrera, Zeta Acosta
Universidad Nacional Pedro Henríquez Ureña, Santo domingo, Dominican Republic

Introduction

Episiotomy has been used worldwide since the mid-19th century to facilitate childbirth by enlarging the vaginal canal. Episiotomy is a procedure that is decreasing in practice but remains prevalent in some parts of the world. This study examines the episiotomy rate in the Dominican Republic and explores factors influencing its application.

Results

Among the 161 patients, there was a 39% [63/161] episiotomy rate. Of those who underwent the procedure, 35% [22/63] were Haitian, and 65% [41/63] were Dominican. The mean age of mothers who received episiotomies was 23 years old, with a mean newborn weight of 2,981 grams. In this study, the mean newborn birth weight was 2,981 grams in the episiotomy group and 3,003 grams in the non-episiotomy group, indicating that birth weight was not a significant factor in the decision to perform an episiotomy.

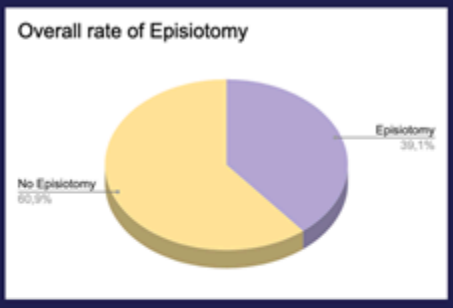


Methodology

A retrospective study was conducted between April and May 2024, focusing on 161 women who underwent vaginal delivery at a public hospital in the Dominican Republic. Data was collected from medical records to document episiotomies. Additional information was also recorded, including newborn weight in grams, maternal nationality, and maternal age. This approach provided a comprehensive view of the factors associated with episiotomy use.

Conclusion

The study identified a high episiotomy rate unrelated to maternal age, nationality, age, or birth weight, suggesting that other factors may influence the decision to perform episiotomies. These findings highlight the need to reevaluate episiotomy practices in public hospitals in the Dominican Republic, aligning with global standards to improve maternal outcomes.



Inspiration

The inspiration for this study is the commitment to improving maternal care in the Dominican Republic, where childbirth practices significantly impact women's health. Despite global recommendations favoring selective use, the high episiotomy rate reflects an urgent need for evidence-based change. This research highlights current practices and promotes safer, patient-centered maternity care, ensuring better outcomes for mothers and newborns. Mothers are the foundation of families and society, and protecting their health is essential to fostering strong communities. This work aligns with the global movement advocating for respectful maternity care, empowering women with safer, evidence-driven childbirth practices for the future.

57

Passive Maternal Smoking and Offspring Health in The Gambia: A Cross-sectional Observational Pilot Study

Dr. Yahya Korteh[1], **Etianna Etienne**[2]
[1]Montefiore Medical Center - Wakefield Hospital, [2]Lone Star College

Biography: *Yahya Korteh is a 28-year-old foreign medical graduate who recently graduated from medical school where he received his Medical Doctorate. Yahya is a former Regional Director for Africa at the International Federation of Medical Students Associations (IFMSA) and is currently interning at Montefiore Hospital in New York at Dr. Mohammad Naeem Clinic. His academic background and leadership roles have instilled in him a strong commitment to advancing medical education and research. Yahya has also worked as a Clinical Laboratory Officer at the Medical Research Council, London School of Tropical Medicine, and returned there for a medical elective in 2022. He has participated in global health conferences, including the World Health Assembly, WHO-Afro Regional Committee Meeting, WONCA, and several IFMSA events. As a prospective U.S. medical resident, Yahya is excited to be attending this conference and the opportunity to present his research and engage with fellow professionals. Etianna Etienne is a 29-year-old Hospice & Palliative Registered Nurse and pre-medical student. She attended the University of St. Thomas in Houston, Texas where she earned her Bachelor of Science in Nursing degree. She is currently a post-baccalaureate student at Lone Star College in Houston, Texas where she is completing her pre-medical coursework. She is passionate about community health and has been involved in local health fairs where she has presented topics such as maternal and nutritional health. She is an active member of Sigma Gamma Rho Sorority and spends her free time volunteering locally with the American Red Cross and Houston Medical Reserve Corps. Etianna also volunteers annually with The Marie Victor Foundation in her place of birth in Port-Margot, Haiti. Yahya and Etianna both look forward to sharing their work, learning from others, and building connections at FP4C 2025.*

Abstract

Background: The harmful effects of maternal smoking, both active and passive, are well-documented, but there remains a significant gap in knowledge concerning its specific impact on maternal and infant health in low-income countries like The Gambia. This study aims to assess the prevalence of passive maternal smoking (PMS) during pregnancy in The Gambia and its association with adverse health outcomes, including cleft palate, asthma, and pregnancy complications like eclampsia. By addressing the knowledge gap in low-income settings, this pilot study seeks to highlight the impact of PMS on maternal and infant health.

Methods: This study utilized a cross-sectional observational study on passive maternal smoking on offspring's health in The Gambia. This study focuses on the health of offspring exposed to passive maternal smoking. The study involved questionnaires given to mothers to collect data on their smoking exposure and the health status of the mothers and their infants.

Results: The prevalence of passive smoking among pregnant women in the study was found to be 18% (n=72). A significant association was observed between passive smoking and the occurrence of cleft palate disorder in newborns (X^2=4.721, p=0.032). Mothers exposed to passive smoke during pregnancy were more than three times as likely to give birth to children with cleft palate [OR=3.387, 95% CI (1.005-11.413), p=0.049]. Additionally, passive maternal smoking was significantly linked to the development of asthma in infants (p=0.026), with passive smokers being 3.322 times more likely to have asthmatic children [aOR=3.322, 95% CI (1.058-10.432)]. Moreover, mothers exposed to secondhand smoke had a higher likelihood of developing eclampsia during pregnancy [AOR=1.236, 95% CI (2.575-2.655)].

Conclusion: The study suggests that passive maternal smoking is significantly associated with adverse health outcomes such as cleft palate, asthma, and eclampsia. Although the study is based on maternal self-reporting, which may introduce bias, it underscores the need for more comprehensive research involving diagnostic tools and follow-up studies to further assess the impact of passive smoking on pregnancy.

Inspiration: We chose this topic to highlight the overlooked impact of passive maternal smoking on maternal and infant health in low-income settings like The Gambia. Limited healthcare access and societal norms often leave pregnant women vulnerable to secondhand smoke, with little awareness of its risks. Through addressing this knowledge gap, we hope to promote public health awareness, and foster healthier outcomes for mothers and infants in vulnerable communities.

International Impact Projects

Poster Snapshot

Passive Maternal Smoking and Offspring Health in The Gambia: A Cross-sectional Observational Pilot Study

Yahyah Korteh, MD[1]; Etianna Etienne, BSN, RN[2];
[1]Montefiore Medical Center - Wakefield Hospital ; [2]Lone Star College

Abstract

The adverse effects of maternal passive smoking during pregnancy on offspring health remain understudied in sub-Saharan Africa, particularly in The Gambia, where smoke-free regulations are limited. We aimed to determine the prevalence of passive maternal smoking (PMS) during pregnancy and investigate its associations with adverse pregnancy outcomes and offspring health complications in The Gambia.

Introduction

The harmful effects of maternal smoking, both active and passive, are well-documented. For instance, Prenatal exposure to smoking has been associated with various birth defects such as reduced lung function later in life [1]. However, there remains a significant gap in knowledge concerning its specific impact on maternal and infant health in low-income countries like The Gambia. This study aims to assess the prevalence of passive maternal smoking (PMS) during pregnancy in The Gambia and its association with adverse health outcomes, including cleft palate, asthma, and pregnancy complications like eclampsia. By addressing the knowledge gap in low-income settings, this pilot study seeks to highlight the impact of PMS on maternal and infant health.

We chose this topic to highlight the overlooked impact of passive maternal smoking on maternal and infant health in low-income settings like The Gambia. The lack of observational studies examininge the effects of prenatal smoke exposure on offspring health in Gambia prompted this study [2]. Limited healthcare access and societal norms often leave pregnant women vulnerable to secondhand smoke, with little awareness of its risks. By addressing this knowledge gap, we hope to promote public health awareness, and foster healthier outcomes for mothers and infants in vulnerable communities.

Methods and Materials

A cross-sectional study was conducted in February 2023 among 401 mothers with children under 5 years in urban and rural regions of The Gambia. Data were collected through questionnaires and verification of antenatal care records. Multivariate logistic regression analyses were performed to examine associations between maternal passive smoking and various health outcomes.

Results

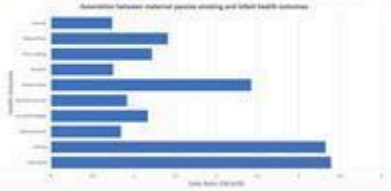
The prevalence of maternal passive smoking during pregnancy was 18% (72/401). Mothers exposed to passive smoking had significantly higher odds of having children with cleft palate [adjusted OR=3.39, 95% CI (1.01-11.41), P=0.049] and offspring with asthma [aOR=3.32, 95% CI (1.06-10.43), P=0.038]. Specifically, mothers exposed to passive smoking were more than three times more likely to have children with cleft palate, and their children were more than three times more likely to develop asthma.

Table 1: Association between maternal passive smoking and infant health outcomes

Health Outcomes	Odds Ratio (OR/aOR)	p-value
Cleft Palate	3.387	0.049
Asthma	3.322	0.026
Hydrocephalus	0.8449	0.85
Low birth Weight	1.17	0.74
Retarded Growth	0.918	0.86
Preterm birth	2.42	0.29
Jaundice	0.75	0.8
Poor suckling	1.22	0.64
Malnutrition	1.41	0.34
Anemia	0.74	0.6

Figure 1. Unilateral cleft lip and cleft palate

Figure 2. Chest contusion in a newborn



Discussion

Health Outcomes Associated with Passive Maternal Smoking

- Cleft Palate: Cleft palate is a congenital condition where the roof of the mouth is not fully developed, often impacting feeding, speech, and breathing [3].
- Asthma: Asthma is a chronic respiratory condition that causes airway inflammation, resulting in wheezing, coughing, shortness of breath, and chest tightness [4].

Clinical Implications and Preventive Measures

Equipped with the knowledge of the complications that neonates exposed to passive smoking during pregnancy face, healthcare providers can enhance their assessment and intrapartum education. This includes monitoring for common signs and symptoms of cleft palate and asthma in newborns. For example, it is important to assess newborns for wheezing as approximately 30% of infants and preschoolers with recurrent wheezing develop asthma at school age [5]. In newborns, health care providers can assess for nasal flaring, chest contusion, and cyanosis as these can be evidence of asthma in a neonate [6].

Preventive measures can include educating communities about the risks of passive smoking during pregnancy and recognizing the early signs of related complications. In underdeveloped nations, children born with cleft lip and/or cleft palate may face long-term challenges due to limited access to corrective surgeries. This condition can impair feeding and increase the risk of infections due to compromised oral integrity. By assessing mothers for passive smoking exposure and conducting thorough respiratory assessments in newborns, healthcare providers can implement interventions to manage and prevent severe asthma complications or fatalities [7].

Conclusions

This study reveals significant associations between maternal passive smoking during pregnancy and increased risks of cleft palate and asthma in offspring within the Gambian context. These findings highlight the need for strengthened smoke-free policies and targeted interventions to protect pregnant women from secondhand smoke exposure. Future prospective studies with biochemical validation of exposure are warranted to establish causality and examine long-term health impacts.

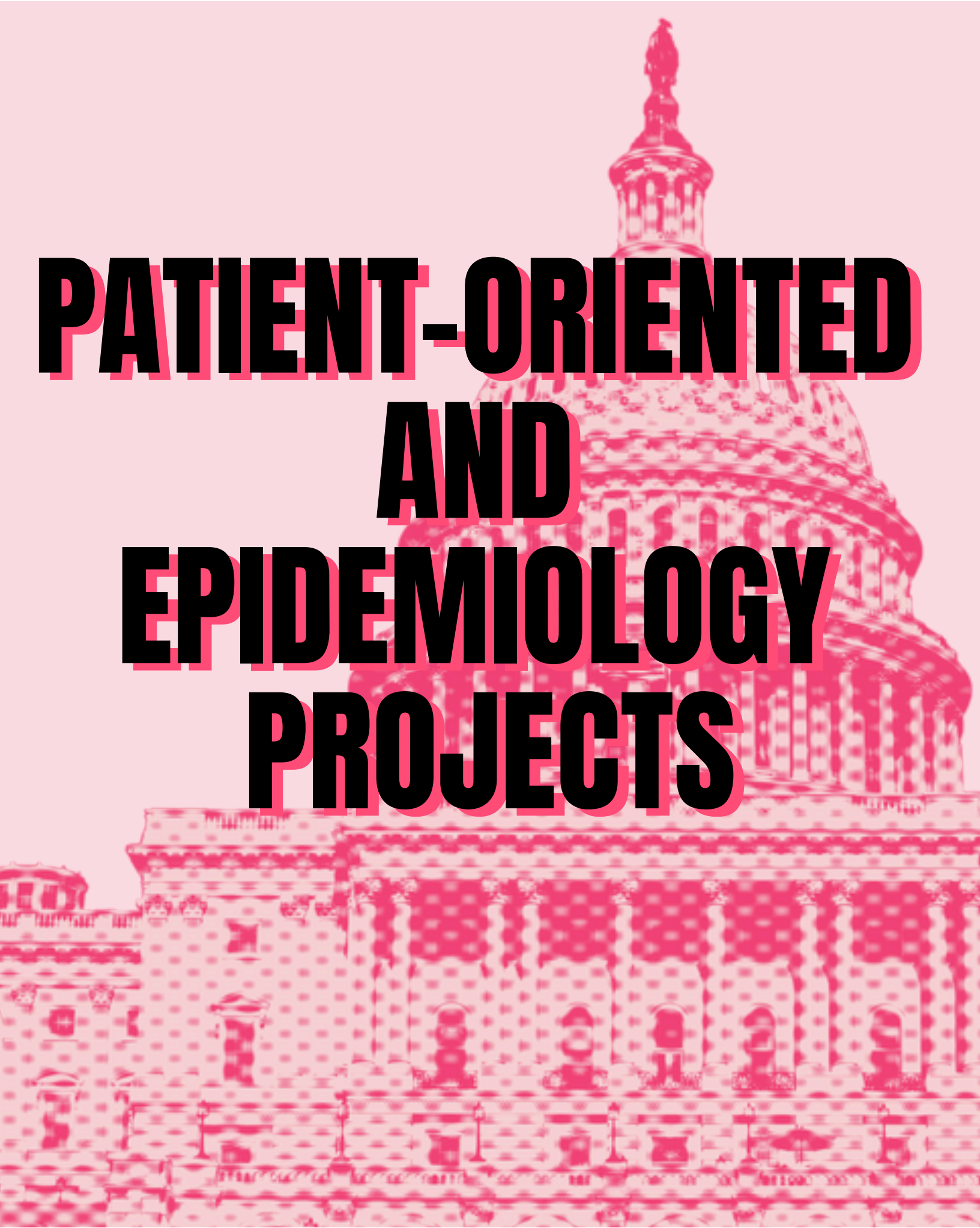
Contact

Yahyah Korteh, MD
Montefiore Medical Center - Wakefield Hospital
New York, NY

Etianna Etienne, BSN, RN
Lone Star College
Houston, TX

References

1. Accortt, E., Cheravil, L., Johannesen, A., Benedetti-Isshiki, R., Bertelsen, B. I., Birkbeck, J., Dhaenagle, S. C., Forsberg, B., Gimet Neal, F., Holloway, I. W., Holm, M., Jansen, C., Jilg, B. O., Jilg, R., Malkowschi, A., Marcon, A., Martinez-Moratalla Rovira, J., Sánchez Ramos, J. C., Schlünssen, V., Torén, K., ... Suarez, C. (2021). Prenatal and peripubertal exposures to tobacco smoke in men may cause lower lung function in future offspring: a three-generation study using a causal modelling approach. The European respiratory journal, 58(4), 2003795. https://doi.org/10.1183/13993003.03795-2020
2. Cham, B., Mbaye, N. D., Bauld, L., Britton, J., & D'Alessandro, U. (2021). Exposure to Second-Hand Smoke in Public Places and Barriers to the Implementation of Smoke-Free Regulations in The Gambia: A Population-Based Survey. International journal of environmental research and public health, 18(18), 9743. https://doi.org/10.3390/ijerph18189743
3. Phelan A, Goldman D. Cleft Palate. [Updated 2024 Dec 12]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2025 Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK441876/
4. Loza AM, Goldin J, Cortes L. Pediatric Asthma. [Updated 2024 May 6]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2025 Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK430904/
5. Martinez FD, Wright AL, Taussig LM, Holberg CJ, Halonen M, Morgan WJ; Asthma and wheezing in the first six years of life. The Group Health Medical Associates. N Engl J Med. 1995 Jan 19;332(3):133-8. doi: 10.1056/NEJM199501193320301. PMID: 7800004.
6. "Asthma in Infants." Asthma & Allergy Foundation of America, Asthma and Allergy Foundation of America, 30 Apr. 2020, aafa.org/asthma/living-with-asthma/asthma-in-infants/.
7. Chung HL. Diagnosis and management of asthma in infants and preschoolers. Clin Exp Pediatr. 2022 Dec;65(12):574-584. doi: 10.3345/cep.2021.01746. Epub 2022 Apr 13. PMID: 35418814; PMCID: PMC9757924.



PATIENT-ORIENTED AND EPIDEMIOLOGY PROJECTS

115

Participant Demographics in U.S. Pediatric Leukemia and Lymphoma Trials Since the NIH Revitalization Act of 1993

Andres Diaz[1], Sohail Daulat, Jasen Alabana, Shreyas Hallur, Shiv Shah, **Sara Diaz**
[1]University of Arizona College of Medicine

Biography: *Andres Diaz is an MD/PhD candidate at the University of Arizona College of Medicine – Phoenix, dedicated to advancing equity in cancer research and care through translational science and global health advocacy. His research in the laboratory of Dr. James Bibb centers on the role of CDK5/p25 signaling in neuroendocrine tumor proliferation, migration, and treatment resistance. He is particularly focused on identifying novel therapeutic targets and using biochemical assays, protein interaction studies, and reporter systems to investigate the molecular mechanisms driving aggressive tumor phenotypes.In parallel with his laboratory work, Andres has led initiatives that bridge science and global health. He co-developed the EzMTX Project, a low-cost, urine-based methotrexate monitoring system designed to improve treatment safety in pediatric oncology settings with limited resources. His global provider survey and cost-effectiveness analyses have informed its potential use as a bridge tool for patients navigating transitions between hospitals and treatment regimens. Andres also plays a national leadership role in the American Medical Student Association (AMSA), where he serves as Editor-in-Chief of The New Physician magazine. In this role, he has reoriented the publication to serve as a training platform for students interested in narrative medicine, policy writing, and advocacy. His efforts have included launching writing workshops, mentoring students on public-facing science communication, and shaping AMSA's editorial vision to better reflect health justice values.*

Abstract

Introduction: Despite mandates from the NIH Revitalization Act of 1993 aimed at enhancing diversity in clinical trials, disparities in demographic representation persist in pediatric oncology research. Equitable representation is crucial for developing universally effective therapies and reducing disparities in pediatric cancer outcomes. This study assesses current racial, ethnic, and gender disparities in clinical trials for pediatric liquid tumors, specifically Acute Myeloid Leukemia (AML), Acute Lymphoblastic Leukemia (ALL), Hodgkin's Lymphoma, and Non-Hodgkin's Lymphoma (NHL).

Methods: We analyzed completed pediatric oncology trials registered on ClinicalTrials.gov. Participant demographics were extracted, categorized, and analyzed to evaluate representation patterns. Data were stratified by cancer type (AML, ALL, Hodgkin's lymphoma, NHL), and analyzed for disparities by comparing trial demographics to national pediatric cancer incidence rates.

Results: Quantitative analysis revealed significant disparities in racial and ethnic representation. Hispanic participants were notably underrepresented in pediatric ALL trials (mean trial representation: 14.56%, $p = 0.00486$) despite comprising approximately 30% of pediatric ALL cases nationally. Similarly, Black participants were significantly underrepresented in AML trials (mean trial representation: 11.79%, $p = 0.0476$), and NHL trials demonstrated significant racial disparities, with Black pediatric patients having significantly higher mortality yet lower trial representation (HR: 1.51, 95% CI: 1.02–2.23, $p = 0.041$). Asian participants were also underrepresented (mean trial representation: 4.27%, $p = 0.0078$). Conversely, White participants were significantly overrepresented across trials (mean trial representation: 83.19%, $p < 0.0001$). Gender representation was relatively balanced, with slight male overrepresentation observed (mean trial representation: 58.46%, $p < 0.0001$).

Conclusion: Nearly three decades after the NIH Revitalization Act, significant racial and ethnic disparities in pediatric liquid tumor clinical trial participation remain. These gaps underscore the urgent need for targeted recruitment strategies, standardized demographic reporting, and policy reinforcements to achieve equitable trial representation, ultimately aiming to improve treatment outcomes and survival for all pediatric oncology patients.

Inspiration: This project was driven by a desire to understand how disparities in clinical trial representation may contribute to broader treatment inequities in pediatric oncology. Recognizing that trial participation influences both access to emerging therapies and the applicability of study outcomes, we aimed to highlight the need for more thoughtful and inclusive trial design. Our focus extended beyond local disparities, acknowledging global challenges in equitable care delivery. This work reflects a commitment to advocating for fair representation not only in pediatric cancer trials but also across the broader spectrum of pediatric medicine. Equitable research is essential for equitable care.

Patient-Oriented and Epidemiology Projects

59

Amphetamine shortages may disproportionately affect females: A case study of neural circuitry differences by medication type in 6–8-year-olds

Darius Shahbazi[1]
[1]Kansas City University College of Osteopathic Medicine

Biography: *Darius Jalen Shahbazi is a medical student, currently attending Kansas City University College of Osteopathic Medicine, in Kansas City, Missouri. Student Doctor Shahbazi previously attended Creighton University, in Omaha, Nebraska, as a student in the Honors Program, earning a Bachelor of Science degree in Neuroscience.*

Abstract

Background: Amphetamine medication shortages led providers to prescribe alternatives to individuals suffering from attention-deficit/hyperactivity disorder (ADHD). However, most research validating efficacy is conducted on males, with limited research showing efficacy in females. As part of a research team, we recruited both medicated and unmedicated male and female pediatric patients to investigate how children learn, make executive decisions, and process information.

Methods: In order to investigate the interaction between gender and clinical status of neural connectivity at rest, the target population included medicated and unmedicated male and female subjects. Utilized tools included functional infrared spectroscopy (fNIRS), eye-tracking, and electroencephalography (EEG) to study factors affecting neurological developmental trajectories, as well as long-term outcomes of executive functioning. Thus, we investigated the relationship between functional connectivity, ocular-motor control, behavior, and ADHD risk, and the implications of certain medication shortages, using randomized controlled trials. The findings were represented through 3-dimensional diagrams to map neural circuitry and visualize neural connections.

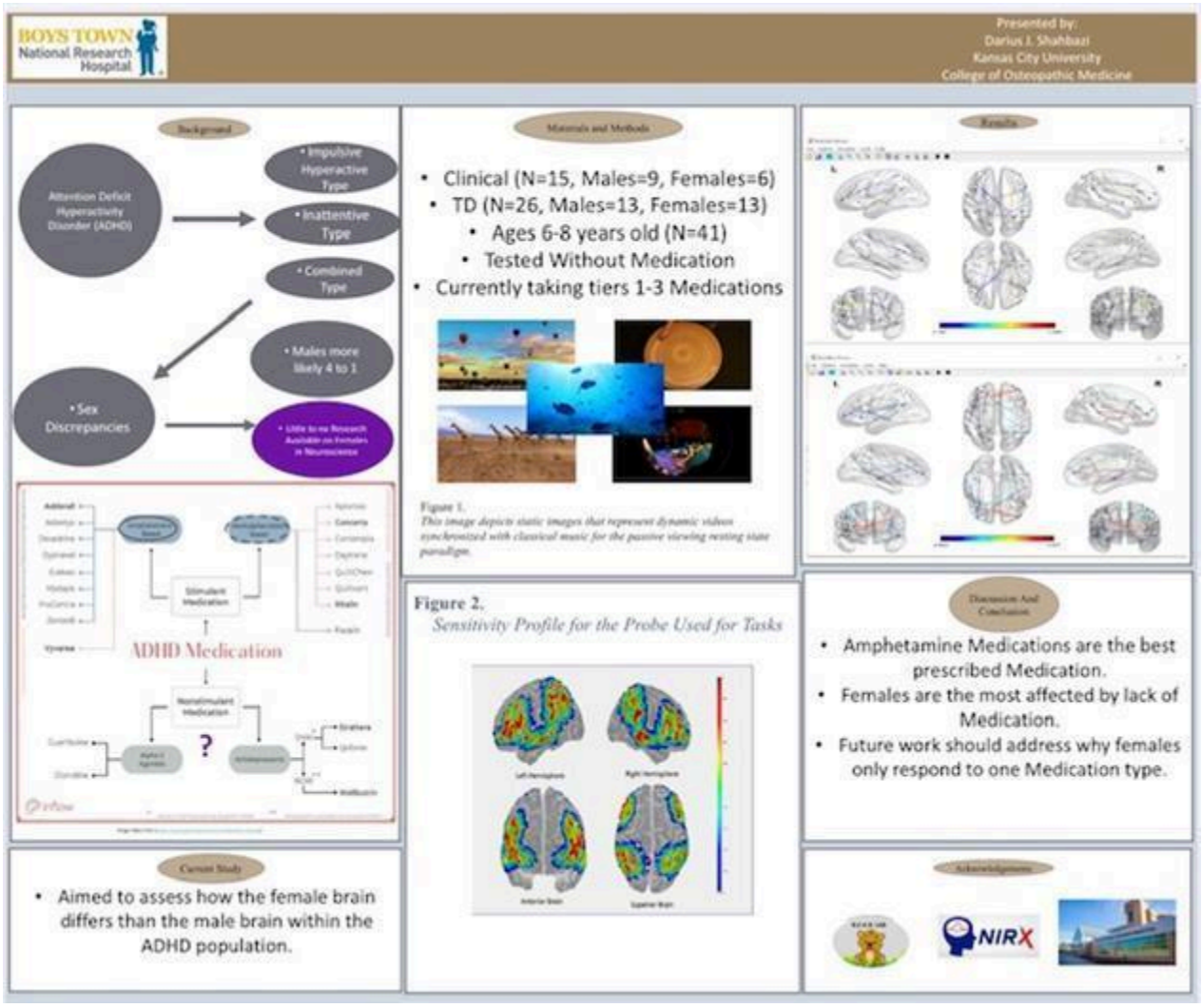
Results: Based on gender differences in neural circuitry at rest, amphetamine shortages directly impacted females more than males, as females responded differently to secondary options. Unlike males, females taking methylphenidates and nonstimulants had significantly less neural connections across hemispheres. These females also shared similar neural circuitry with females not taking medication, as compared to females on amphetamines. These results indicate Type 2/Type 3 medications were ineffective in remedying ADHD. This highlights a post-COVID-19 pandemic challenge facing providers pertaining to shortages of certain medications and inferior alternatives.

Conclusions: Amphetamine medications remain superior prescribed options. Females are most affected by a shortage or lack thereof. However, additional studies are necessary to address specific limitations on females as to alternative medications. Furthermore, clinical treatment of males versus females for like conditions may result in social and ethical dilemmas when medication shortages influence prescription practices and gender affects efficacy.

Inspiration: This research was inspired by the necessity to understand not only the clinical ramifications of our findings, but also the social and ethical dilemmas involving medical treatment of males versus females for like conditions. Specifically, while it is common knowledge pharmaceutical shortages influence prescription practices, prescribing alternatives with little information on efficacy may result in unintended consequences, particularly if one's gender influences that efficacy. Therefore, the underpinnings of this study were motivated by the importance of doing research on both genders, as the lack of gender-specific findings have more than just medical consequences; there may be socioeconomic consequences as well.

Patient-Oriented and Epidemiology Projects

Poster Snapshot



60

A Correlation Between a Dysregulated Circadian Rhythm & Early-Onset Alzheimer's Disease: a Transcriptomic Meta-Analysis

Lilianna Henry[1,2]
[1]Marymount University, [2]The Collegeboard Advanced Placement Capstone Program

Biography: *Lilianna is a pre-medical student pursuing the double majors of Biology and Spanish at Marymount University. She has been committed to flourishing her community by dedicating summers to volunteering at assisted living centers and children's bible studies as a co-youth pastor. To serve her peers and mentors at her institution, she has fortified a pious dedication to the positions of Student Government Senator and Dining Committee Chair to deliver a holistic wellbeing experience. Her interpersonal and scientific interests have converged with her current internship at Emerson Clinical Research Institute where she employs her bilingual skills in delivering personalized clinical care to populations typically underserved in healthcare. The breadth of her skills translates to military hospitals and paramedic settings as her role of an US Army Reserves Combat Medic has equipped her with emergency medicine qualifications to serve as a soldier-first responder. The passion for bedside care traverses to the laboratory bench for Lilianna as she has been deemed with a designation in Health & Medicine from the Global Scholars Society, the position of Chemistry Department Laboratory Assistant for her institution, and group lead status in the Simply Neuroscience Action Potential Advising Program for neurodegenerative disease awareness and research. She continues to expound on her initial investigation by evaluating the accuracy of transcriptomics against electrophoresis for neurodegeneration biomarkers and confounding variables for such implicative conditions during the early-onset phase in middle-aged adults. Lilianna aspires to receive an MD-PhD in Medicine and Neuroscience, respectively, to contribute to healthcare as a neurosurgeon.*

Abstract

Background: Alzheimer's Disease (AD), the most prevalent form of dementia, is one of the leading causes of cognitive decline in older adults. It is characterized by amyloid peptide (Aβ) deposits along neuronal dendrites and axons in conjunction with tau proteins. This precipitates neurodegeneration, mostly in regions associated with cognition, memory, and critical thinking. Patients, prior to the diagnosis and accompanying prognoses of Alzheimer's disease, have been noted across clinical research to showcase a disrupted sleep-wake schedule. As the sleep-wake cycle is governed by the circadian rhythm, the gene expressions associated with its cycles were analyzed. The glymphatic system principally operates during the timed "rest" stage at night by circadian signals. With the continuous buildup of the toxic tau and Aβ proteins during the rapid progression of AD in middle-aged adults, hindrance of the cleansing processes of the glymphatic system prompted the measurement of the clustering proteins' mRNA seq against that of the Bmal1 circadian gene.

Methods: RNA-seq genomic analysis is the most utilized in comparable investigations and was employed in this methodology as the intricate neuronal extensions impede detection of local synthesis of proteins. The expressions of the pertinent genes app, Bmal1, Cst7, and Apoe were measured for a correlational relationship. A meta-analysis between homo sapiens and mus musculus was conducted from the observed gene expression results via Pearson correlation, chi-square, and linear regression tests.

Results: This research does not support the hypothesis as the relationship of app and Apoe on Bmal1 has been clarified for there to be no significant bi-directional relationship between app and Apoe implicating Bmal1 gene expression; this corresponds to present research as Bmal1 regulates transcription of many other clock-controlled genes.

Conclusion: The elimination of Aβ accumulation by regulatory properties has been indicated and will provide new insights into how cleansing properties can prolong or prevent the onset of early onset AD. ($d=0.409$, $\bar{x}=6.929$, $s=18.771$, $p=0.05$).

Inspiration: Memory-rehabilitative care is inherently designed for elderly populations as memory loss and planal disorientation is associated with them. Patients undergoing Early-Onset Alzheimer's Disease rarely are diagnosed with this subset due to the ambiguity of the origin of the disease and lack of apparent cures. Dismissal of patient-reported memory and sleep abnormalities due to the difference of age between the populations increases the risk of late diagnosis and aggravated symptoms. As a result of this research, an apparatus can be implemented to evaluate glymphatic function from apparent circadian dysregulation.

Patient-Oriented and Epidemiology Projects

61

A Medical Student-Run Hospital Tobacco Treatment Program

Saanya Lingineni[1], Sherry Wu[1], Kevin Shan[1], Matthew Wang[1], John Grable[1]
[1]University of Rochester Medical Center SOM and Dentistry

Biography: *Saanya Lingineni is a second-year medical student at the University of Rochester School of Medicine and Dentistry. She completed her undergraduate education at Cornell University, receiving a B.A. in Biology with a concentration in Neurobiology and Behavior. She is passionate about clinical research and has endeavored in projects related to neuromuscular disease, pediatric traumatic brain injury, smoking cessation, and asylum-clinics. She hopes to use her clinical research skills in her daily practice as a future physician.*

Abstract

Background: The COVID-19 Pandemic increased nurses' workload and effectively halted our hospital's smoking-cessation program. In 2022, the program switched from using nurses to training medical students to alleviate this workload.

Methods: Medical students trained for bedside and post-discharge counseling using two one-hour Zoom training sessions run by a faculty member. These students participated throughout all elements of the program, including screening and enrolling patients from hospital units and assigning patients to counselors. Students performed bedside counseling and then called patients (at 3 and 6 weeks) along with New York State Quitline counselors after discharge. Each patient's smoking status was obtained during 3 outcome calls at 4 weeks, 3 months, and 6 months.

Results: 37 medical students currently participate. From 1/29/22 to 5/18/24, 250 patients were enrolled, and outcomes were followed out to 6 months. The 7-day point prevalence quit rates for the as-treated (AT) patients were 66/121 (55%), 37/77 (48%) and 33/70 (47%) for 4 weeks, 3 months, and 6 months, respectively; for the intent-to-treat (ITT) patients, these were 66/250 (26%), 37/250 (15%) and 33/250 (13%). Before 2022, nurses had achieved AT quit rates of 50%, 42%, and 38% (n= 178, 151, 143), and ITT quit rates of 23%, 16%, and 14% (n=385) at the same time-points, respectively. Students had no significant difference from nurses in quit rates at all time points (4 weeks, 3 months, 6 months, respectively) for AT (p= 0.513, 0.441, 0.246) and ITT (p= 0.463, 0.846, 0.747) groups.

Conclusions: Students become effective bedside and call counselors with just two brief training sessions, with quit rates comparable to nurses' quit rates. The program 6-month AT quit rate (47%) exceeds the benchmark self-report AT quit rate (25%) designated for successful hospital programs.

Inspiration: We often hear that helping patients stop smoking is the best thing one can do for their health but providing effective tobacco treatments to hospitalized smokers remains a challenge. Staff nurses initially performed the bedside and post-discharge counseling. However, this did not sustain during the COVID-19 Pandemic due to nurse's stress and shortage. We anticipate that many hospitals have had similar struggles due to the exhausting workload of doctors, nurses, and other healthcare staff. This program is unique as it lightens this workload burden while providing training and practical experience in tobacco counseling for medical students, who effectively treat smoking patients at no cost to the hospital.

Patient-Oriented and Epidemiology Projects

Poster Snapshot

A Medical Student-Run Hospital Tobacco Treatment Program

Saanya Lingineni, BA*; Sherry Wu, BA*; Kevin Shan, BA; Matthew Wang, BS; John C. Grable, MD, PhD
*These authors contributed equally
Department of Medicine, University of Rochester School of Medicine & Dentistry, Rochester, NY, USA

Introduction

Background:
- Treating inpatients for tobacco dependance is difficult.
- The Rochester Model (RM) is a QI program that treats inpatient smokers.

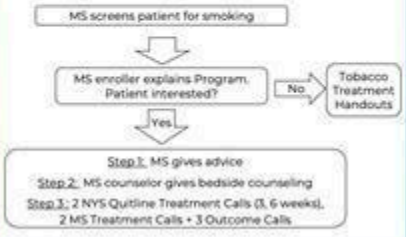
History:
- Initial program relied on staff nurses for counseling.
- Transitioned to medical students in 2022 due to COVID-related nurse shortages.

Purpose:
- Train medical students (MS) as recruiters, managers, and counselors.
- Provide effective cessation counseling at no cost to hospital.

Methods

Student Recruitment & Training:
- Medical students created student-run organization to recruit.
- Training for bedside and post-discharge counseling done via two Zoom sessions (~1 hour each) by faculty.

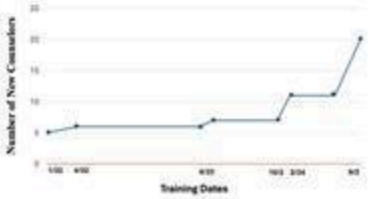
Counseling & Follow-Up:
- Students screened and enrolled patients from hospital units.
- Students performed bedside and follow-up calls alongside NYs Quitline counselors.
- Smoking status tracked at outcome calls at designated times.



Results

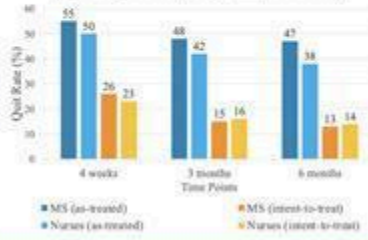
Student Participation:
- Growth from 5 to 20 new student counselors (2022-2024).
- 37 medical students (1st to 4th year) actively participating.
- 89% of students had satisfaction with training.

Figure 1. Number of MS Counselors over time



Patient Enrollment & Quit Rates:
- 250 patients enrolled by MS (1/2022-5/2024).
- 385 patients enrolled by nurses (2/2016-3/2021).

Figure 2. Quit Rates (7-day point prevalence)



Results (Continued)

Table 1. Outcomes of all MS counseled patients:

	Patients Counseled by MS		
Timepoint	**4-week**	**3-month**	**6-month**
Quit	66	37	33
Smoke	55	40	37
Lost to f/u	129	173	180
Total	250	250	250

- 6-month AT quit rate (47%) exceeded the benchmark of 25% for hospital programs.
- Students and nurses had no significant difference in quit rates at all time points for as-treated (4 weeks, 3 months, 6 months respectively: p=0.513, 0.441, 0.109) and intent-to-treat (4 weeks, 3 months, 6 months, respectively: p= 0.463, 0.846, 0.747) groups.

Conclusions

Key Achievements by a Novel Program:
- Medical students effectively perform cessation counseling.
- Combines student training and patient treatment.
- Provides real-world counseling experience to medical students at no hospital cost.

Acknowledgements

Thanks to all the medical student counselors for their work in providing counseling to patients, and all providers associated with the enrollment.

References

- Crable J, Lin J, Peltzer K, et al. Integrating Tobacco Dependence Treatment into Hospital Practice Using the Rochester Model. Journal of Multidisciplinary Healthcare. 2023;16:905-911.
- Crable J, Shan K, Wang M, et al. Training Medical Student Counselors for the Rochester Model, a Hospital Tobacco Treatment Program. Journal of Multidisciplinary Healthcare. 2024;17:601-607.
- Taylor CB, Miller NH, Cameron R, et al. Dissemination of an effective inpatient tobacco use cessation program. Nicotine Tobacco Res. 2005; 7(1):129-137.

62

A Rapid Decline in A Patient with Creutzfeldt-Jakob Disease

Mishal Siddiqui[1], **Muhammad Nawaz**, Tamara Williams, Haniya Siddiqui
[1]Campbell University School of Osteopathic Medicine

Biography: *Mishal Siddiqui is a third-year medical student at Campbell University School of Osteopathic Medicine in North Carolina. Originally from Houston, Texas, with roots in Pakistan, she is passionate about pediatrics and plans to pursue a residency in the field. In addition to her clinical interests, she is actively involved in medical research and is dedicated to advancing pediatric care and improving health outcomes for underserved populations. Beyond medicine, Mishal is deeply committed to global social and health justice. She advocates for equitable healthcare access and supports the efforts of countries and communities seeking freedom from oppressive regimes and the lasting impacts of colonization. She believes in the power of medicine to drive meaningful change, particularly in regions where systemic inequalities affect health and well-being. Mishal has a diverse set of skills and interests. She is fluent in three languages and holds black belts in both Karate and Taekwondo. An avid artist, she creates custom artwork and finds creative expression to be a valuable complement to her medical journey. As a student liaison for Color of Medicine, Mishal is dedicated to mentoring future healthcare professionals by guiding on navigating the challenges of medical education. She aims to support students in overcoming obstacles, managing setbacks, and achieving their full potential in their chosen careers. Through her work, she hopes to inspire others to use medicine as a tool for advocacy, empowerment, and lasting social impact.*

Abstract

Background: Creutzfeldt-Jakob disease (CJD) is a rare, rapidly progressive spongiform encephalopathy caused by the accumulation of misfolded prion proteins, which undergo a transformation from the normal alpha-helix configuration (prpc) to abnormal beta-pleated sheets (prpsc). The disease typically leads to a rapidly progressive decline in motor, neurologic, and functional abilities, often culminating in severe disability or death within months. However, the rate of progression can vary significantly among patients, as well as the classification of CJD; being either sporadic, genetic, or acquired (infectious) with some cases demonstrating an exceptionally accelerated course.

Case Presentation: We present the case of a 59-year-old Pakistani woman with a one-month history of mood changes, irritability, temper tantrums, and progressive motor dysfunction. Neurological examination revealed basic orientation, flexed upper extremities with dyskinetic movements of upper and lower extremities and a prominent startle reflex. Over the next 2 weeks, while admitted, her condition deteriorated rapidly, resulting in complete incapacitation and inability to respond within a total of 6 weeks. MRI and EEG findings were highly suggestive of CJD, and the diagnosis was ultimately confirmed through cerebrospinal fluid (CSF) analysis.

Discussion: This patient's rapid neurological decline within a short time frame is atypical even within the spectrum of CJD cases. Factors influencing disease progression include age of onset, co-morbidities, specific CJD classification, and possibly even the pathogenicity of the misfolded prion proteins. The acceleration seen in this case raises questions about unidentified biological or environmental factors that could influence disease trajectory. While CJD is universally fatal, recognizing and characterizing these rapidly progressive forms can refine diagnostic criteria and enhance early supportive interventions.

Conclusion: This case highlights the importance of early diagnostic imaging and CSF testing in patients presenting with unexplained neuropsychiatric and motor symptoms. Furthermore, it underscores the need for clinicians to recognize atypical and accelerated presentations of CJD, including fluctuating neurological signs. Although early detection cannot alter the disease course, it may allow for improved quality of life and prevention of disease transmission in those with the genetic subtype. Awareness of these variations in disease progression can ultimately help guide clinical decision-making and future research into neurodegenerative disorders.

Inspiration: This case highlights the importance of equitable healthcare for minority populations. As an immigrant woman with a rare disease, our patient faced potential barriers to timely diagnosis and specialized care. This underscores the need for culturally competent medicine and advocacy to ensure all patients receive dignified and comprehensive care.

Patient-Oriented and Epidemiology Projects

63

A Rare Case of Type II Adult Hypertrophic Pyloric Stenosis Secondary to Chronic Peptic Ulcer Disease: A Case Report

Riah Lee[1], Sylvia Dygulski[1], Dr. Yasmine Hemida[2], Dr. Guillermo Uy
[1]Touro College of Osteopathic Medicine Middletown, [2]Garnet Health Medical

Biography: *Born and raised in South Korea, Riah moved to the United States at the age of ten and quickly adapted to her new environment with her open-minded nature and eagerness to learn. Early financial hardships gave her firsthand insight into the transformative power of compassionate medical care, as she often relied on community clinics and volunteer physicians for treatment. Inspired by the kindness and dedication she encountered, Riah set her sights on becoming a physician who could holistically support the well-being of others, especially those facing systemic barriers.In school, she excelled academically, graduating with high honors while engaging in a rich array of extracurricular pursuits, including orchestra and athletics. At the University of Illinois at Urbana-Champaign, she completed her undergraduate studies in Interdisciplinary Health Sciences with a concentration in Aging and Health. This academic foundation deepened her understanding of the complex factors influencing patient care, reinforcing her desire to serve diverse and underserved populations.Her commitment to holistic healthcare was further strengthened through hands-on experiences, including an internship at a nonprofit healthcare organization dedicated to assisting immigrants and low-income families, practicing medicine as an EMT, and participating in multiple research fellowships. She graduated within 3.5 years and was able to be on the Dean's list with high honors. These opportunities allowed her to witness the impact of culturally sensitive, community-based medical interventions and fueled her conviction that every patient deserves equitable, empathetic care.*

Abstract

Background: Adult hypertrophic pyloric stenosis (AHPS) is a rare subtype of gastric outlet obstruction (GOO) without a history of recurrent vomiting or other gastrointestinal symptoms, which are typically seen in infancy. Its incidence is reported to constitute less than 0.1%. AHPS Type 2 is the most common type of AHPS cases that arise from underlying GI pathologies such as recurrent peptic ulcer disease, malignancy, vagal hyperactivity, and extrinsic adhesions. Typical symptoms of AHPS Type 2 include epigastralgia, dyspepsia, dysphagia, nausea, and vomiting.

Case Presentation: This is a 43-year-old male with a past medical history of recurrent gastritis, PUD, and dysphagia, presenting to the emergency department (ED) multiple times with intractable nausea and vomiting, globus pharyngeus, and dysphagia to both solids and liquids. An incomplete EGD showed retained food material in the stomach and severe edema at the pylorus with stenosis, which limited the passing of the scope. CT abdomen/pelvis with IV contrast showed marked distention of the stomach, unable to rule out GOO and inflammatory changes in the duodenum. Robotic distal gastrectomy with roux-en-y reconstruction was performed and the patient was subsequently discharged without major complications.

Discussion: Type 2 AHPS occurs in adulthood and arises from underlying GI pathologies like PUD, malignancy, and recurrent inflammation. Radiological images can show Kirklin's or string sign, although they are highly variable. The UGI endoscopy is often required to rule out other causes of GOO and may show a cervix sign. With history, physical examination, and radiography often failing to provide definitive results, fiberoptic gastroscopy with histopathological examination is a more reliable diagnostic tool. While non-surgical management, such as proton pump inhibitors, has shown mild efficacy in treatment, distal gastrectomy with Billroth I anastomosis is the standard surgical approach for symptomatic AHPS.

Conclusion: AHPS is a rare cause of gastric outlet obstruction in adults, and diagnosis is based upon radiological and endoscopic findings after excluding other common causes of GOO. We emphasize the importance of including AHPS in the differential diagnosis for patients presenting with globus pharyngeus and dysphagia.

Inspiration: While case reports are not able to be generalized, they provide important information to healthcare providers. If more cases can offer valuable insights to providers worldwide, I believe they can help expand the differential diagnosis and ultimately improve the quality of patient care. Medicine is a field full of unknowns, and only through more findings and publications we can achieve a better understanding.

Patient-Oriented and Epidemiology Projects

Poster Snapshot

A Rare Case of Type II Adult Hypertrophic Pyloric Stenosis Secondary to Chronic Peptic Ulcer Disease: A Case Report

Riah Lee, BS, Sylvia Dygulski, BS, Yasmine Hemida, DO, Heather Galindo, MD,
Guillermo Uy, MD
Garnet Health Medical Center, Middletown, NY

Garnet Health MEDICAL CENTER

TOURO COLLEGE OF OSTEOPATHIC MEDICINE

Background

- Adult hypertrophic pyloric stenosis (AHPS) is a rare subtype of gastric outlet obstruction (GOO) without a history of recurrent vomiting or other gastrointestinal symptoms that are typically seen in infancy.
- AHPS Type 2 is the most common type of AHPS that arises from underlying GI pathologies such as recurrent peptic ulcer disease, malignancy, vagal hyperactivity, and extrinsic adhesions.
- Typical symptoms of AHPS Type 2 include epigastralgia, dyspepsia, dysphagia, nausea, and vomiting.

Objective

- To accentuate a rare case of an adult male with AHPS type 2 presenting with severe dysphagia, intractable nausea and vomiting, and globus pharyngeus.

Case Presentation

History of Present Illness

This is a 43-year-old male with a past medical history of recurrent gastritis, PUD, and dysphagia, presenting to the emergency department (ED) multiple times with intractable nausea and vomiting, globus pharyngeus, and dysphagia to both solids and liquids.

Vitals, Physical Exam, Labs, and Imaging

- Afebrile, VSS
- PE: Throat: no mucosal lesions, limited ability to speak normally Abdomen: soft, non-distended, non-tender, no guarding, rebound tenderness, or rigidity
- Incomplete EGD showing retained food material in stomach and severe edema at pylorus with stenosis, which limited passing of the scope
- CT abdomen/pelvis with IV contrast showed marked distention of the stomach, unable to rule out GOO and inflammatory changes in duodenum

Assessment and Plan

- Refractory peptic ulcer disease with subsequent pyloric stenosis causing gastric outlet obstruction
- NPO with IVF hydration
- NGT decompression
- IV PPI for GI prophylaxis
- Pain control PRN
- Robotic distal gastrectomy with Roux en Y anastamosis

Findings

- EGD showed esophagitis in the distal esophagus, unable to locate the Z-line. Multiple 4-8mm clean-based ulcers were found in the body with a pinhole-sized opening at the pylorus. Scope was unable to pass (Figure 1).
- Pyloric balloon dilation not recommended due to the risk of perforation.
- Robotic distal gastrectomy with roux-en-y reconstruction performed without major complications.
- A gastrectomy specimen measuring 6.5 x 4.5 x 2.5 cm showed focal, moderate, nonspecific chronic inflammation but was negative for H. pylori, acute inflammation, granuloma, dysplasia, or tumor.
- NGT placed intraoperatively and UGI performed POD#1 that showed no extravasation from gastrojejunostomy. NGT was removed, patient was able to tolerate CLD and was hemodynamically stable. Patient subsequently discharged on POD #4 with instructions to follow up in 2 weeks.

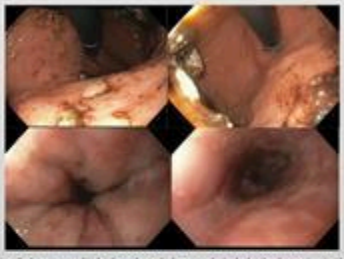


Figure 1 showing multiple clean based ulcers and pin-hole sized opening in the pyloric canal

Figures 2, 3, 4 show the kirklin, string, and cervix sign respectively [9,11,12]

Discussion

- Adult hypertrophic pyloric stenosis is rare and poorly defined because of its uncommon presentation in adulthood and misleading clinical and radiological features, with less than 300 cases reported in the literature.[1]
- Type 2 AHPS occurs in adulthood and arises from underlying GI pathologies like PUD, malignancy, and recurrent inflammation.[1]
- Radiological images can show Kirklin's or string sign, although radiological picture is highly variable.[3]
- UGI endoscopy is needed to rule out other causes of GOO and may show a cervix sign.[5,6]
- With history, physical examination, and radiography often failing to provide definitive results, fiberoptic gastroscopy with histopathological examination are more reliable diagnostic tools (5).
- Distal gastrectomy with Billroth I anastomosis is the standard surgical approach for symptomatic AHPS.[4,7]
- Other techniques include laparoscopic pyloromyotomy and endoscopic dilatation in appropriate cases.[8]
- Non-surgical management, such as using proton pump inhibitors, has shown efficacy for mild cases.[2,9]

Conclusion

- AHPS is a rare cause of gastric outlet obstruction in adults, and diagnosis is based upon radiological and endoscopic findings after excluding other common causes of GOO.
- It is important to keep AHPS in a differential diagnosis in an adult patient with gastric outlet obstruction.
- Conservative treatment as well as distal gastrectomy with Billroth I anastomosis are recommended for optimal results.
- This approach effectively addresses the obstruction while preserving function of the stomach and duodenum.
- Continued follow-up is important to monitor for complications such as anastomotic leakage or symptom recurrence.

References

64

A retrospective study to assess demographic, socio-economic and health-care access disparities in skin cancer patients

Nanditha Srinivasan[1], Dr. Shreya Deoghare, Dr. Marina Samuel Basta, Dr. Selamawit Mammo, Dr. Kambam Sneha Reddy
[1]Sri Ramachandra Institute of Higher Education and Research

Biography: *Dr. Nanditha Srinivasan is a doctor who is passionate about filling the gaps in patient care to improve clinical outcomes, exploring emerging healthcare tech and upholding patient rights in healthcare settings and beyond.*

Abstract

Introduction: Skin cancer is a common cancer in the United States of America. Assessing socio-economic disparities helps to understand the complexities surrounding skin cancer diagnosis and treatment accessibility.

Aims: To assess demographic, socio-economic, and healthcare access disparities in patients with skin cancer.

Methods: A retrospective study was conducted using BRFSS-WEAT for “2021” and “All” United States regions. The dependent variable selected for skin cancer was ‘Ever told you had skin cancer?’. The independent variables were demographic (age, sex, race), socio-economic status (education level, employment status, and annual household income), health status (mental and physical health status), and healthcare access disparity.

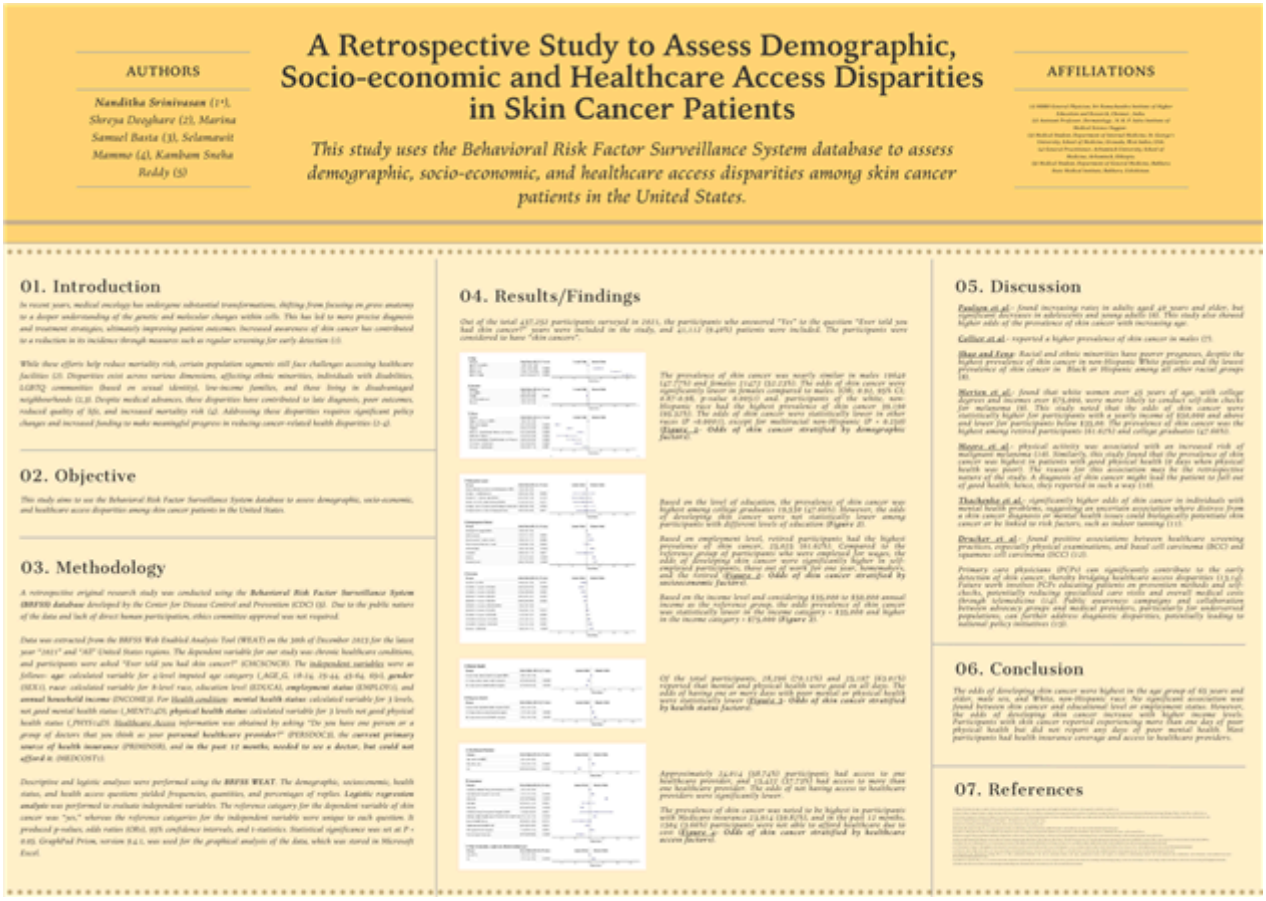
Results: Skin cancer prevalence was reported by 41,112 (9.40%) survey participants, highest in the age group 65 years and above 29,698 (72.24%), males 19640 (47.77%), white, non-Hispanic race 39,190 (95.32), and with Medicaid insurance 23,914 (59.82%). Based on income level, the odds of skin cancer prevalence were statistically lower in the income category of < $35,000 and higher in the income category > $75,000. More than 8% of participants had access to more than one healthcare provider.

Conclusion: Skin cancer risk is highest among 65+, male, and white non-Hispanics, with income level correlated with increased risk. Poor physical health is common, but mental health is not.

Inspiration: Skin cancer is a common cancer in the United States of America and it is only through assessing socio-economic disparities, that we can understand the complexities surrounding skin cancer diagnosis and treatment accessibility and the factors that can affect patient outcomes so that the healthcare system can do more for the people. So, the inspiration for this study was to contribute to the existing data to do our part.

Patient-Oriented and Epidemiology Projects

Poster Snapshot



AUTHORS

Nanditha Srinivasan (1), Shreya Deoghare (2), Marina Samuel Basta (3), Selamawit Mamme (4), Kambam Sneha Reddy (5)*

A Retrospective Study to Assess Demographic, Socio-economic and Healthcare Access Disparities in Skin Cancer Patients

This study uses the Behavioral Risk Factor Surveillance System database to assess demographic, socio-economic, and healthcare access disparities among skin cancer patients in the United States.

AFFILIATIONS

01. Introduction

02. Objective

03. Methodology

04. Results/Findings

05. Discussion

06. Conclusion

07. References

66

Analyzing the Impact of Social Determinants and Discrimination on Disparities in Coronary Atherosclerotic Disease Rates Among Black and White American Males

Ida Wilks[1]
[1]University of Houston

Biography: *Ida Wilks is a Bachelor of Science in Biology student at the University of Houston with a strong passion for research and healthcare. She has experience analyzing cardiovascular health disparities among underserved populations, focusing on the intersection of social determinants and health outcomes. Ida's dedication to innovation and scientific inquiry is complemented by her clinical experience in patient care. She aspires to pursue a career in medicine, contributing to advancements in equitable healthcare.*

Abstract

Background: Coronary atherosclerotic disease (CAD) is a significant cause of mortality in the United States, with notable disparities in its prevalence between racial groups. This study was pursued to investigate the correlation between social determinants of health and higher rates of atherosclerosis in Black American males compared to White American males aged 45 to 85. The project addresses the need for understanding how systemic oppression and social inequities drive health disparities, aiming to inform interventions and policies that promote equitable cardiovascular care.

Methods: This study analyzed data from a cohort of 1,000 male participants (500 Black and 500 White Americans) aged 45-85, obtained from the All of Us research database. Statistical methods included a t-test to compare disease prevalence between the two populations and regression analysis to assess the impact of social determinants—such as income, neighborhood resources, and racial treatment—on disease rates.

Results: Preliminary results revealed significantly higher mean atherosclerosis scores in Black participants (31.22) compared to White participants (20.52), with a p-value < 0.05, indicating statistical significance. Regression analysis highlighted higher levels of discrimination were positively correlated with increased atherosclerosis scores ($\beta = +3.277$), while reduced access to healthcare ($\beta = -1.671$) and neighborhood resources ($\beta = -1.924$) were associated with higher disease rates. These findings underscore the substantial impact of social determinants on cardiovascular health disparities. Data collection and analysis will be completed at a TBD date due to ongoing research.

Conclusion: The study demonstrates that social determinants significantly influence the higher prevalence of atherosclerosis in Black American males. These findings underscore the urgent need for targeted public health interventions and policies addressing systemic inequities. Future research will explore the biological mechanisms, including epigenetic factors, that may link social determinant stressors to cardiovascular outcomes.

Inspiration: This project was driven by a commitment to addressing health inequities and understanding how systemic discrimination impacts underserved populations. Witnessing the pervasive disparities in cardiovascular outcomes among Black Americans fueled a passion to explore the intersection of social determinants and disease prevalence. Additionally, as a Black young woman who has experienced firsthand the loss of multiple relatives to heart failure (though not specifically atherosclerosis), this research holds deep personal significance. The broader implications of these findings emphasize the critical need for inclusive research and targeted interventions in medicine. By uncovering the social and biological pathways contributing to health disparities, this study aims to inspire systemic changes that prioritize equitable healthcare for all.

Patient-Oriented and Epidemiology Projects

Poster Snapshot

Analyzing the Impact of Social Determinants and Discrimination on Disparities in Coronary Atherosclerotic Disease Rates Among Black and White American Males Over Age 45

UNIVERSITY OF HOUSTON

Author's Block
Ida Wilks[1]
University of Houston[1]

ABSTRACT

Atherosclerosis, a type of heart disease characterized by arterial hardening due to plaque buildup, is driven by risk factors such as obesity, hypertension, and high cholesterol. Despite extensive research, the high prevalence of atherosclerosis among Black Americans remains insufficiently addressed. This study investigates correlations between social determinants rooted in systemic oppression—such as economic status, racial treatment, historical context, and neighborhood resources—and atherosclerosis rates in Black and White Americans aged 45-85. The focus on Black males over 45 recognizes the influence of historical experiences on behaviors and health risks. To analyze these trends, two statistical tests were used: a t-test compared atherosclerosis rates between populations, while regression analysis assessed the impact of social determinants on these rates. Results indicated that atherosclerosis rates were significantly higher among Black Americans, with social determinants contributing substantially to this disparity.

BACKGROUND

Oppression and discrimination have notoriously been a significant part of African American history, with many cultural habits and customs emerging as responses to these experiences. These historical oppressions have created longstanding health impacts, such as atherosclerosis. Research from the American Heart Association emphasizes that structural racism is a fundamental driver of health disparities, particularly in cardiovascular disease, where factors like economic hardship, racial bias in healthcare, and limited neighborhood resources contribute to poorer health outcomes in Black Americans (American Heart Association, 2020). Because of these strong correlations between culture, race, and discrimination, it is critical to evaluate the impact of these factors on atherosclerosis, a more specific form of coronary artery disease. Atherosclerosis is typically integrated into broader topics in research rather than being exclusively studied, this case drove this topic to be studied further.

OBJECTIVE

The primary aim of this study is to highlight prevalent health disparities affecting underrepresented populations, particularly in relation to atherosclerosis. Addressing these high rates is crucial to identifying healthcare and community gaps affecting underrepresented populations. We hypothesize that social determinants and discrimination contribute significantly to higher rates of atherosclerosis among Black Americans, emphasizing the importance of these factors in cardiovascular health research development and intervention.

METHODS

To assess disparities in atherosclerosis rates, both a t-test and regression analysis were applied to the study cohort. The t-test was used to compare disease prevalence between Black and White Americans, while regression analysis explored the impact of social determinants (such as income, neighborhood resources, and racial treatment) on disease rates. These methods allow for both comparative and in-depth analyses of factors associated with atherosclerosis. Data were obtained from a sample of 1,000 male participants (500 Black and 500 White Americans), aged 45-85. Analyses were conducted using Python.

ACKNOWLEDGEMENTS

- All of Us database and participants
- AHA for their article *"Coronary Artery Disease in African Americans: A Review of Pathophysiology and Clinical Outcomes"* as it was utilized for background research
- NIH(National Institute of Health)

RESULTS

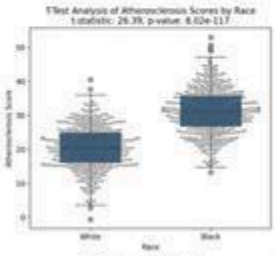


Figure 1.

- Shows a statistically significant difference in atherosclerosis scores between Black and White populations (p-value < 0.05)
- Mean Atherosclerosis Scores:
  - Black participants: 31.22
  - White participants: 20.52

Approximately a 10.7 mean difference- meaning atherosclerotic rates are significantly higher in the Black American male population

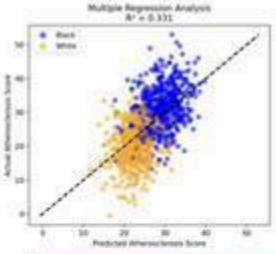


Figure 2.

Discrimination Score: +3.277 (positive correlation)
Healthcare Access: -1.671 (negative correlation)
Resource Access: -1.924 (negative correlation)

- The negative coefficients for healthcare access (-1.671) and resource access (-1.924) indicate that lower access to these resources is associated with higher atherosclerosis scores
- The strong positive coefficient for discrimination (3.277) indicates that higher levels of discrimination are associated with higher atherosclerosis scores

CONCLUSION & FUTURE GOALS

This study highlights the significant influence of social determinants on health disparities in cardiovascular disease, specifically atherosclerosis, within underrepresented communities. As shown by the results, social determinants substantially impact atherosclerosis rates. Future research will further investigate the role of social determinants by examining epigenetic mutations and genetic factors that may arise from prolonged exposure to social determinant stressors, such as economic instability and racial discrimination. These stressors will be evaluated for their potential role in triggering genetic mutations linked to atherosclerosis, providing deeper insight into how social factors biologically affect health outcomes. This approach may support the development of more effective preventive and progressive treatments tailored to Black Americans. Additionally, this exploration may clarify the biological mechanisms driving the increased atherosclerosis rates observed within the Black American male population.

67

Associations Between Food Insecurity and Self-Perceived Physical and Mental Health Among Urban College Students

Lily Amorosino[1], Mackenzie Konyar[1], Aditi Venkateswaran[1], Sean Watley[2], Grace Jordan[1], Kaleigh Steigman[2], Andrew Sonn[2], Jennifer Sacheck[3], Gabby Headrick[1]
[1]George Washington University Milken Institute School of Public Health, [2]George Washington University, [3]Brown University School of Public Health

Biography: *Lily Amorosino is a recent graduate of George Washington University, where she earned a Bachelor of Science in nutrition with a pre-medical professional concentration. During her time at GW, Lily was committed to public health research and student mentorship. She actively participated in IRB-approved studies, worked as a learning assistant in the Biological Sciences Department, and served as a student brand ambassador for Kaplan Test Prep. Lily earned honors status from both the University Honors Program and the Department of Exercise and Nutrition Science after successfully defending her senior thesis on college food security. Lily is currently preparing to apply to medical school and will be working as a medical scribe in orthopedic surgery during her gap year. As an aspiring physician, she plans to integrate her background in nutrition science into her medical practice to improve patient outcomes and overall quality of life.*

Abstract

Background: College students are at an increased risk for food insecurity (FI) compared to the general U.S. population due to unique economic and social realities of universities. The experience of FI creates barriers to students' ability to thrive in dynamic college settings. Thus, this study investigates the relationship between persistent and episodic FI and self-perceived physical and mental health among residential students at a large, private, urban institution.

Methods: A total of n=155 students completed a longitudinal online survey at three time points across the Fall 2024 semester (September, October, and December). We measured FI using the Six-Item Short Form of the USDA Household Food Security Survey Module, self-reported physical health using the CDC HRQOL–4, depression using the PHQ-2, and anxiety using the GAD-2. We summarized findings using descriptive statistics and chi-square tests.

Results: In our sample, 23% of students experienced FI persistently and 14% experienced FI episodically, highlighting that a total of 37% of students experienced FI at least once during the semester. Experiencing FI was associated with poorer self-reported physical health, depression, and anxiety. Of students reporting fair or poor health, 52% experienced persistent FI compared to the 27% who experienced food security ($p<0.0001$). Additionally, 65% of students with depression ($p=0.011$) and 49% with anxiety ($p=0.038$) experienced FI at least once during the semester.

Conclusion: These findings highlight the negative associations between FI and student well-being, underscoring the need for continued and expanded comprehensive interventions, such as improved access to food resources and additional basic needs support.

Inspiration: Meeting food needs has been a challenge since I first stepped on campus. Not knowing where one's next meal will come from can hinder a student's ability to thrive. This shared experience of uncertainty among my peers sparked a call-to-action within me. I chose to dedicate my senior thesis to exploring food insecurity and its relation to students' physical, mental, and academic well-being. The present findings will inform evidence-based solutions to college food insecurity and advocacy for policies to expand food resources. As an aspiring physician, I aim to integrate my background in public health nutrition into medical practice, ultimately to improve patient outcomes and overall quality of life.

Patient-Oriented and Epidemiology Projects

68

Beyond Assessments: Sociocultural Impact on Attention Deficit Hyperactivity Disorder Presentation and Diagnosis

Tetteh-Ocloo Freda[1], Moreen Famosa, Vincent Harvey
[1]American Canadian School of Medicine

Biography: *Freda is a second year medical student that is interested in addressing health disparities.*

Abstract

Background: Attention Deficit Hyperactivity Disorder (ADHD) criteria are based primarily on research done with caucasian school aged boys, leading to misdiagnosed or undiagnosed ADHD in women and racial minorities.

Case Presentation: Taylor, an 18-year-old African-American college student, was referred to the university psychiatrist due to difficulties finishing exams on time, complaints of distraction, poor time management, and challenges completing tasks. She had no prior medical or psychiatric history. The college psychiatrist diagnosed her with ADHD based on her history, reported symptoms, and DSM-IV diagnostic criteria. Taylor was referred to a psychologist for further assessment for testing accommodation purposes. The psychologist ruled out ADHD due to her "reserved" appearance, yet acknowledged that her symptoms aligned with ADHD. Taylor received a diagnosis of Mathematics and Reading Disorder due to processing speed even though he noted her "high average math score and intelligence quotient (IQ) score were the best indicator of her present aptitude". At 28, Taylor self-referred for evaluation due to chronic tardiness to work, difficulty completing tasks, and frequent job changes. She was diagnosed with ADHD and anxiety disorder.

Discussion: Accurate ADHD diagnosis can be challenging due to sociocultural factors that impact how symptoms present. Taylor reported experiencing ADHD symptoms, yet her academic performance and behavior didn't reflect these challenges. When patients' behavioral characteristics deviate from expectation, it may lead to misjudging the severity of a diagnosis or inaccurate diagnosis. Studies suggest that individuals with good stable environment, strong family support, or higher than average IQ are better able to manage the challenges of ADHD consequently masking ADHD behavioral characteristics. Over time, Taylor's symptoms became harder to conceal and its effects were evident in her personal and professional life.

Conclusion/Inspiration: At the onset of symptoms and self reports by the patient she should have been assessed in a manner that takes in account her social and cultural construct as encouraged by DSM-IV. This would have resulted in an earlier diagnosis as well as treatment. Clinicians should be trained, knowledgeable, and experienced in working with diverse populations, as their clinical judgment is influenced by personal experience and knowledge. ADHD diagnoses came from clinicians of the same race and gender as the patient while the math and reading disorder came from a clinician of a different race and gender. Race conscious and culturally responsive care is essential to ensure that all patients of various backgrounds can receive the care that they need.

Patient-Oriented and Epidemiology Projects

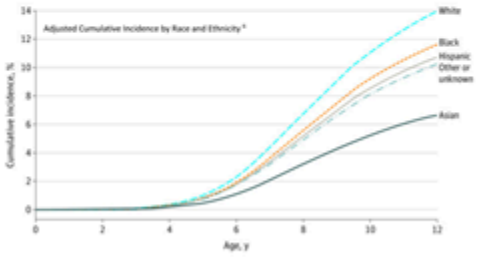
Poster Snapshot

Beyond Assessments: Sociocultural Impact on ADHD Presentation and Diagnosis

Freda Tetteh-Ocloo [1], Moreen Famosa [1], Vincent Harvey [1]
[1] American Canadian School of Medicine

Background

Attention Deficit Hyperactivity Disorder (ADHD) criteria are based primarily on research done with caucasian school aged boys, leading to misdiagnosed or undiagnosed ADHD in women and racial minorities[6].



Case

Taylor, an 18-year-old African-American college student, was referred to the university psychiatrist due to difficulties finishing exams on time, complaints of distraction, poor time management, and challenges completing tasks. She had no prior medical or psychiatric history. The college psychiatrist diagnosed her with ADHD based on her history, reported symptoms, and DSM-IV diagnostic criteria.

Taylor was referred to a psychologist for further assessment for testing accommodation purposes. The psychologist ruled out ADHD due to her "reserved" appearance, yet acknowledged that her symptoms aligned with ADHD. Taylor received a diagnosis of Mathematics and Reading Disorder due to processing speed. At 28, Taylor self-referred for evaluation due to chronic tardiness to work, difficulty completing tasks, and frequent job changes. She was diagnosed with ADHD and anxiety disorder.

ASRS: Adult ADHD Self-Report Scale; DSM-IV: Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition; WAIS-IV: Wechsler Adult Intelligence Scale, Fourth Edition; BAARS-IV: Barkley Adult ADHD Rating Scale-IV

Discussion

Accurate ADHD diagnosis can be challenging due to sociocultural factors that impact how symptoms present. Taylor reported experiencing ADHD symptoms, yet her academic performance and behavior did not reflect these challenges. When patients' behavioral characteristics deviate from expectation, it may lead to misjudging the severity of a diagnosis or inaccurate diagnosis [5]. Studies suggest that individuals with good stable environment, strong family support, or higher than average IQ are better able to manage the challenges of ADHD consequently masking ADHD behavioral characteristics [3]. Over time, Taylor's symptoms became harder to conceal and its effects were evident in her personal and professional life

Illustration of how ADHD is typically diagnosed

Flowchart of how factors can influence ADHD expression and diagnosis

Conclusions

At the onset of symptoms and self reports by the patient she should have been assessed in a manner that takes in account her social and cultural construct as encouraged by DSM-IV [1]. This would have resulted in an earlier diagnosis as well as treatment. Clinicians should be trained, knowledgeable, and experienced in working with diverse populations, as their clinical judgment is influenced by personal experience and knowledge. ADHD diagnoses came from clinicians of the same race and gender as the patient while the math and reading disorder came from a clinician of a different race and gender. Race conscious and culturally responsive care is essential to ensure that all patients of various backgrounds can receive the care that they need.

Ethical Consideration

For privacy, all identifying information has been removed, and the patient's name has been changed to ensure their identity remains confidential.

Freda Tetteh-Ocloo
American Canadian School of Medicine
focloo@acsom.edu.dm

1. Association, A. P. (2021). *Diagnostic and Statistical Manual of Mental Disorders (DSM-5)*. American Psychiatric Publishing.
2. Attoe, D. E., & Climie, E. A. (2023). Miss. Diagnosis: A Systematic Review of ADHD in Adult Women. *Journal of Attention Disorders, 27*(7), 645–657. https://doi.org/10.1177/10870547231161533
3. Kosaka, H., Fujioka, T., & Jung, M. (2018). Symptoms in individuals with adult-onset ADHD are masked during childhood. *European Archives of Psychiatry and Clinical Neuroscience, 269*(6), 753–755.
4. Shalaby, N., Sengupta, S., & Williams, J. B. (2023). Large-Scale analysis reveals racial disparities in the prevalence of ADHD and conduct disorders. *medRxiv (Cold Spring Harbor Laboratory)*.
5. Williamson, D., & Johnston, C. (2015). Gender differences in adults with attention-deficit/hyperactivity disorder: A narrative review. *Clinical Psychology Review*, 40, 15–27.
6. Shi, Y., Guevara, L. R. H., Dykhoff, H. J., Sangaralingham, L. R., Phelan, S., Zaccariello, M. J., & Warner, D. O. (2021). Racial disparities in diagnosis of Attention-Deficit/Hyperactivity Disorder in a US national birth cohort. *JAMA Network Open, 4*(3), e210321.

69

Clinical Manifestations and Effects of Dengue Fever in Post-Operative Renal Transplant Recipient Patients

Maria Perez, **Daniel Rodriguez**, **Manuel Medina**

Biography: *María Pérez is a second-year medical student (MS2) at UNIBE with a strong interest in pediatric cardiology and nephrology. She is the founder of the non-profit organization TinyHeartsDR and is actively engaged in several ongoing research projects. Daniel Rodriguez is a third-year medical student with a deep passion for pediatric oncological surgery and a commitment to helping others. He actively participates in various research projects and community service initiatives as a founding member and Chief of Finances for the non-profit organization TinyHeartsDR. Manuel Medina is a third-year medical student with a profound passion for surgery and aspirations to continue his education in Brazil after medical school to specialize in surgery. He serves as part of the coordination team for the Surgery Interest Group at UNIBE, where he contributes to helping medical students enhance their education beyond the classroom.*

Abstract

Background: Dengue Fever (DF) is a viral infectious disease transmitted by Aedes species mosquitoes. DF is hyper-endemic in many Latin American countries, while being relatively rare in the U.S, it's associated with recent travel. Renal transplant patients (RTP) who live in these hyper-endemic regions are at a higher risk of exposure and complications. In recent years, there has been a large increase in investigations that study the complications between DF and RTP, but it's still under investigation. The objective of this meta-analysis is to review the effects of DF on post-operative RTP.

Methods: We performed a search through GoogleScholar, PubMed and ResearchGate, using keywords “Renal/Kidney transplant” and “Dengue Fever," without adding date limits. We removed all duplicates found and excluded all results that included pediatric patients. We analyzed 8 cross-sectional studies, 5 case/series reports and 2 meta-analyses that studied the complications brought on by DF in post-operative RTP and extracted all pertaining data. Overall, the studies found fit to be included in this analysis had over 300 patients with 2 long-term studies analyzing over 1000 patients.

Results: We discovered that the use of immunosuppression therapy post-op when infected with DF, rarely created negative manifestations for most patients. Most patients experienced a decrease in renal function while infected (measured by an elevated serum creatinine). For this analysis, elevated serum creatinine was seen as over 3 mg/dL or an increase of >0.5mg/dL .Though we saw that post-DF infection, most patients saw a return to basal level. Patients diagnosed with DF within the first month post-operation were more likely to develop severe complications, including graft dysfunction or loss, disseminated intravascular coagulation and thrombocytopenia, which lasted more than in normal populations (> 6 days). Studies found no significant relationship between patient age and outcome. Most common symptoms observed were myalgia, fever, and leukopenia (< 4000/mcL).

Conclusion:Postoperative RTP are more susceptible to DF complications than the general population. Patients with earlier post-op infections were more likely to see complications and lasted longer with existing symptoms.Patient mortality is usually associated with the mix of other underlying pathologies and early post-operative exposure to DF.

Inspiration: Dengue Fever is a great cause of mortality in many Latin American countries and can complicate many surgical procedures. Many of these countries lack the resources to study these relationships which increase mortality rates overall. It is of great importance that whenever possible we investigate clinical correlations that can reduce mortality overall.

Patient-Oriented and Epidemiology Projects

Poster Snapshot

Clinical Manifestations and Effects of Dengue Fever in Post-Operative Renal Transplant Recipient Patients

Maria Pérez Flaquer (MS2), Daniel Rodriguez (MS3), Manuel Medina (MS3)

Universidad Iberoamericana (UNIBE)

BACKGROUND

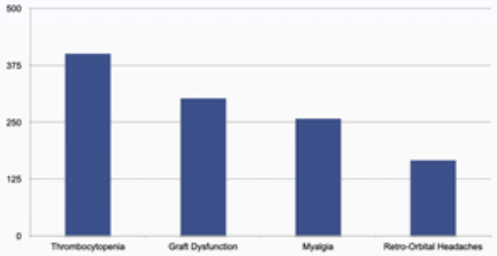
Dengue Fever (DF) is a viral infectious disease transmitted by Aedes species mosquitoes. DF is hyper-endemic in many South American countries while being relatively rare in the U.S, it's associated with recent travel. Renal transplant patients (RTP) who live in these hyper-endemic regions are at a higher risk of exposure and complications. In recent years, there has been a large increase in investigations that study the complications between DF and RTP, but it's still under investigated.The objective of this meta-analysis is to review the effects of DF on post-operative RTP.

METHODS

We performed a search through GoogleScholar, PubMed and ReasearchGate by keywords "Renal/Kidney transplant" and "Dengue Fever" without adding date limits. We removed all duplicates found and excluded all results that included pediatric patients. We analyzed 8 cross-sectional studies, 5 case/series reports and 2 metanalysis that studied the complications brought on by DF in post-operative RTP and extracted all pertaining data. Overall, the studies found fit to be included in this analysis had over 300 patients with 2 longterm studies analyzing over 1000 patients.

RESULTS

We discovered that the use of immunosuppression therapy post-op when infected with DF, rarely created negative manifestations for most patients. ***Most patients experienced a decrease in renal function while infected (measured by an elevated serum creatinine).*** For this analysis elevated serum creatinine was seen as over 3 mg/dL or an increase of >0.5mg/dL. Though we saw that post-DF infection, most patients saw a return to basal level. **Patients diagnosed with DF within the first month post-operation were more likely to develop severe complications, including graft dysfunction or loss, disseminated intravascular coagulation and thrombocytopenia-which lasted more than in normal populations (> 6 days).** Studies found no significant relationship between patient age and outcome. ***Most common symptoms observed were myalgia, headaches, graft dysfunction and thrombocytopenia.***



	Thrombocytopenia	Graft Dysfunction	Myalgia	Retro-Orbital Headaches
Common Symptoms	401	303	256	167

CONCLUSIONS

Post-operative RTP are more susceptible to DF complications than the general population. Patients with earlier post-op infections were more likely to see complications and lasted longer with existing symptoms. Patient mortality is usually associated with the mix of other underlying pathologies and early post-operative exposure to DF.

INSPIRATION

Dengue Fever is a great cause of mortality in many Latin American countries and can complicate many surgical procedures. Many of these countries lack the resources to study these relationships which increase mortality rates overall. It is of great importance that whenever possible we investigate clinical correlations that can reduce mortality overall.

REFRENCES

1. Whitehorn, J., & Farrar, J. (2015). Dengue. *The American Journal of Tropical Medicine and Hygiene*, 93(2), 394–396. https://doi.org/10.4269/ajtmh.15-0038

2. Weerakkody, R. M., Lokuliyana, P. N., & Gunatilake, S. B. (2018). A case of nephrotic syndrome following dengue viral infection: A rare presentation. *Journal of Medical Case Reports*, 12, 260. https://doi.org/10.1186/s13256-018-1790-0

3. Almeida, J. R., Siqueira, M. V., & Oliveira, S. A. (2015). Dengue and rhabdomyolysis. *Revista da Sociedade Brasileira de Medicina Tropical*, 48(6), 783–785. http://dx.doi.org/10.1590/0037-8682-0205-2015

4. Weerakkody, R. M., Peiris-John, R. J., & Gooneratne, I. (2017). Dengue nephropathy in a child with pre-existing renal disease: A case report. *BMC Nephrology*, 18, 15. https://doi.org/10.1186/s12882-016-0428-y

5. Nasim, A., Anis, S., Baqi, S., Akhtar, S. F., & Baig-Ansari, N. (2013). Clinical presentation and outcome of dengue viral infection in live-related renal transplant recipients in Karachi, Pakistan. *Transplant Infectious Disease*, 15(5), 516–525. https://doi.org/10.1111/tid.12119

6. Kumar, S., & Rathi, M. (2007). Dengue infection-associated acute kidney injury: A review. *Nephrology*, 12(6), 555–560. https://doi.org/10.1111/j.1440-1797.2007.00785.x

70

Comparative Effectiveness of Three Potassium Exchangers in the Acute Management of Hyperkalemia

Francisco Ibarra[1,2], **Victor Fu**[1], Colena Mau[1], Dominic Rivera[1], Alexander Arzoo[1]
[1]California Health Sciences University, [2]Community Regional Medical Center - Department of Pharmacy Services

Biography: *Victor Fu is a graduate of UC San Diego, where he earned a Bachelor of Science in Clinical Psychology with minors in Biology and Global Health. His early research focused on the efficacy of treatments for anxiety and depression, as well as cognitive recall of mass shooting events. Now a third-year medical student at California Health Sciences University (CHSU), Victor conducts research under the mentorship of Dr. Francisco Ibarra, focusing on the comparative effectiveness of potassium exchangers in the acute management of hyperkalemia. He is also involved in research on pediatric COVID-19 immunization rates, conducted through a CHSU community partnership with United Health Centers of Fresno County. With an interest in Psychiatry and Internal Medicine, Victor aims to integrate and expand his expertise of clinical psychology and pharmacological sciences into his future medical career.*

Abstract

Background: Potassium exchangers effectively remove potassium from the body via increasing fecal potassium excretion, but their relatively delayed onset of action has limited their use to the management of chronic hyperkalemia. The three potassium exchangers currently approved for managing non-acute hyperkalemia are sodium polystyrene sulfonate (SPS), sodium zirconium cyclosilicate (SZC), and patiromer (PMR). This study determined the comparative effectiveness of these agents in the acute management of hyperkalemia.

Methods: This is an ongoing, IRB approved retrospective study. There are no conflicts of interest to report. The primary purpose of this study was to determine the number of patients who achieved a post-intervention potassium level ≤ 5.5 mmol/L after receiving PMR, SZC, or SPS. Patients were included if their pre-intervention potassium level was > 5.5 mmol/L and they received a single dose of the study drug, in addition to intravenous regular insulin. Patients were excluded if they were < 18 or > 89 years of age, pregnant, incarcerated, or diagnosed with a hyperglycemic emergency.

Results: Preliminary analysis included 10 patients in each arm. The baseline median potassium levels were comparable across the groups. The number of patients who achieved a post-intervention potassium level ≤ 5.5 mmol/L was 4 (40%), 7 (70%) and 8 (80%) in the PMR, SZC, and SPS groups, respectively ($p > 0.05$). The median (interquartile range) reduction in potassium levels following study drug administration was 1 mmol/L (0.7-1.6), 1.6 mmol/L (0.7-2.3), and 1.1 mmol/L (0.6-1.5) in the PMR, SZC, and SPS groups, respectively ($p = 0.11$).

Conclusion: More patients who received SPS and SZC achieved a post-intervention potassium level ≤ 5.5 mmol/L. The largest potassium reduction was observed in the SZC group. None of the findings were statistically significant, likely due to our small sample size. Authors plan to finalize data collection and analysis in the coming months.

Inspiration: Potassium exchangers are not routinely administered in the acute management of hyperkalemia due to their perceived delayed onset of action, but should be considered as their potassium lowering effects may be additive. Furthermore, they may prevent rebound hyperkalemia from occurring once the effects of agents used to temporarily drive potassium into cells wear off. Few studies have evaluated the role of SPS, SZC, and PMR in the acute management of hyperkalemia and it remains unknown how these agents compare to one another.

Patient-Oriented and Epidemiology Projects

Poster Snapshot

Comparative effectiveness of three potassium exchangers in the acute management of hyperkalemia: sodium zirconium cyclosilicate, sodium polystyrene sulfonate, and patiromer

Francisco Ibarra, PharmD[1-3]; Victor Fu, BA[2]; Colena Mau, BA[2]; Dominic Rivera, BA[2]; Alexander Arzoo, BA[2]

1. Community Regional Medical Center, Department of Pharmacy - Fresno, CA; 2. California Health Sciences University College of Medicine - Clovis, CA; 3. University of California San Francisco at Fresno, Department of Emergency Medicine - Fresno, CA

BACKGROUND

- Hyperkalemia (K^+ > 5.5 mmol/L) is a serious electrolyte abnormality which may cause life-threatening cardiac arrhythmias.
- Pharmacological management of hyperkalemia includes the administration of agents to (1) stabilize cardiac membranes (i.e. calcium gluconate), (2) transiently shift potassium from the extracellular to intracellular space [i.e. intravenous (IV) regular insulin], and (3) eliminate potassium (i.e. K^+ binders).
- The three K^+ binders currently approved for the management of non-acute hyperkalemia are sodium polystyrene sulfonate (SPS), sodium zirconium cyclosilicate (SZC), and patiromer (PMR).
- K^+ binders effectively remove K^+ from the body via increasing fecal K^+ excretion, but their relatively delayed onset of action has precluded their use in the acute management of hyperkalemia.
- Addition of K^+ binders in the acute management of hyperkalemia may result in further lowering of K^+.
- Study Purpose: determine which K^+ binder lowers K^+ levels the most when given in addition to standard of care

METHODS

- Design: ongoing, retrospective study at two sites within a healthcare system
- Study sites' acute hyperkalemia order set was updated in December 2022 to include SZC as their K^+ binder (previously SPS) and an IV regular insulin dose of 5 units (previously 10 units)
  - Providers not required to use the order set or order all meds from the order set; PMR is non-formulary but can be ordered
- Inclusion criteria: 18-89 years of age, received a K^+ binder and IV regular insulin ≤ 8 hours of presenting to the hospital, pre-intervention serum potassium > 5.5 mmol/L
  - K^+ binder dose: 8.4 g PMR, 10 g SZC, 15 g SPS
- Exclusion criteria: pregnant, incarcerated, post-intervention labs obtained > 8 hours following study drug administration, received more than one K^+ binder, received more than one IV regular insulin dose, diagnosed with a hyperglycemic emergency and initiated on an insulin infusion (i.e. diabetic ketoacidosis), received dialysis prior to obtaining post-intervention labs
- Primary endpoint: percentage of patients who achieved a post-intervention K^+ level ≤ 5.5 mmol/L within 8 hours of study drug administration
- Secondary endpoints: change in K^+ levels before and after K^+ binder administration

RESULTS

Table 1. Baseline characteristics

	PMR	SZC	SPS	P-value
N	10	10	10	--
Male, n (%)	5 (50)	5 (50)	2 (20)	PMR v SZC: 1 PMR v SPS: 0.35 SZC v SPS: 0.35
Age, yr	68 (61-79)	71 (62-79)	67 (63-75)	PMR v SZC: 0.97 PMR v SPS: 0.65 SZC v SPS: 0.79
Weight, kg	69 (67-86)	75 (66-82)	66 (57-90)	PMR v SZC: 0.79 PMR v SPS: 0.17 SZC v SPS: 0.47
Past medical history, n (%)				
Chronic kidney disease	9 (90)	9 (90)	4 (40)	PMR v SZC: 1 PMR v SPS: 0.06 SZC v SPS: 0.06
Heart failure	7 (70)	4 (40)	6 (60)	PMR v SZC: 0.4 PMR v SPS: 1 SZC v SPS: 0.7
Diabetes	7 (70)	10 (100)	6 (60)	PMR v SZC: 0.2 PMR v SPS: 1 SZC v SPS: 0.09
Other interventions received				
IV regular insulin, n (%)	10 (100)	10 (100)	10 (100)	--
units	10 (8.8-10)	5 (5-5)	10 (10-10)	PMR v SZC: 0.01 PMR v SPS: 0.73 SZC v SPS: 0.003
Nebulized albuterol sulfate, n (%)	1 (10)	3 (30)	1 (10)	PMR v SZC: 0.58 PMR v SPS: 1 SZC v SPS: 0.58
mg	15	15 (15-15)	15	--

Table 2. Results

	PMR	SZC	SPS	P-value
Time from K^+ binder administration to obtaining post-intervention K^+ level, h	3.0 (1.4-4.4)	3.8 (1.9-6.4)	2.9 (2.1-5.0)	PMR v SZC: 0.4 PMR v SPS: 0.7 SZC v SPS: 0.7
Pre-intervention K^+, mmol/L	6.5 (6.2-7.4)	7.0 (6.2-7.8)	6.3 (6.1-6.7)	PMR v SZC: 0.73 PMR v SPS: 0.45 SZC v SPS: 0.33
Post-intervention K^+, mmol/L	5.8 (5.1-5.9)	5.5 (5.1-5.7)	5.2 (4.7-5.5)	PMR v SZC: 0.29 PMR v SPS: 0.13 SZC v SPS: 0.24
K^+ reduction, mmol/L	1.0 (0.7-1.6)	1.6 (0.7-2.3)	1.1 (0.6-1.5)	PMR v SZC: 0.29 PMR v SPS: 0.94 SZC v SPS: 0.52
Patients who achieved a post-intervention K^+ ≤ 5.5 mmol/L, %	40	70	80	PMR v SZC: 0.37 PMR v SPS: 0.17 SZC v SPS: 1

values in Tables 1 and 2 are reported as medians (interquartile ranges) unless stated otherwise

DISCUSSION

- No difference in the percentage of patients who achieved a post-intervention K^+ level ≤ 5.5 mmol/L
- The largest K^+ reduction was observed in the SZC group
  - Finding not statistically significant likely due to our small sample size
- Greater reduction in K^+ levels observed in the SZC group was likely influenced by its relatively faster onset of action
  - PMR onset: 7 hours
  - SZC onset: 1 hour
  - SPS onset: hours to days
- Findings not statistically significant, but are clinically significant
  - IV regular insulin lowers K^+ approximately 0.5-1 mmol/L
  - SZC in addition to IV regular insulin resulted in a median reduction of 1.6 mmol/L
  - SZC has added K^+ lowering effects
- Findings further support the efficacy of reduced insulin doses
  - SZC group received a statistically significantly lower insulin dose and demonstrated the largest K^+ reduction
- Although not evaluated, the addition of K^+ binders in the acute management of hyperkalemia may prevent rebound hyperkalemia from occurring once the effects of the agents used to intracellularly shift K^+ wear off.

CONCLUSIONS

- Preliminary findings suggest K^+ binders should be administered in the acute management of hyperkalemia, with the preferential selection of SZC due to its relatively faster onset action and greater K^+ lowering potential.

REFERENCES

- Palmer BF, Carrero JJ, Clegg DJ, et al. Clinical management of hyperkalemia. *Mayo Clin Proc.* 2021;96(3):744-762. doi:10.1016/j.mayocp.2020.06.014.
- Rafique Z, Peacock F, Armstead T, et al. Hyperkalemia management in the emergency department: An expert panel consensus. *J Am Coll Emerg Physicians Open.* 2021;2(5):e12572. Published 2021 Oct 1. doi:10.1002/emp2.12572.

All study measures and procedures were approved by the local Institutional Review Board. There are no conflicts of interest to report.

71

Concealed Carry Legislation and Firearm-Related Deaths in the United States: Possible Causes and Ramifications

Amelia Liu[1], Kyle Willette[1], Jeanette Manger[1]
[1]Wright State University Boonshoft School of Medicine

Biography: *Amelia Liu is a second year medical student at Wright State University Boonshoft School of Medicine. She is from Los Angeles, CA and her special talent is being able to eat fire.*

Abstract

Background: Previous research has shown that there is not an association between the legislation of constitutional carry and firearm deaths, but rather it is predominantly associated with socioeconomic status and location. On the national scale, the factors that most significantly affected firearm related deaths, firearm homicides, and firearm suicides were partisan lean, urbanization, and poverty rate over these three categories. Concealed carry legislation was not significantly associated with deaths. We are looking at whether the passage of constitutional carry laws have impacts on the rates of firearm-related deaths or violent crime across states. Important variables we are considering include the aforementioned rates of death and crime as well as potential confounding variables, such as socioeconomic status, high school completion and unemployment rate.

Methods: Data was collected from County Health Rankings published for 2016 and 2022.

Results: When looking at correlations of factors such as median household income, completion of high school, and unemployment rate, all correlations were found to be significant.

Discussion: While these factors were found to be significant, they were not able to fully explain firearm fatalities in states that have enacted constitutional carry laws. Our findings support the hypothesis that states that enacted constitutional carry (CC) laws experienced higher rates of firearm-related mortality compared to those without such laws.

Inspiration: The motivation for this project stemmed from the ongoing public debate on gun control and its societal implications. By exploring the nuanced effects of CC legislation and social determinants of health (SDOH), we sought to contribute to evidence-based policies aimed at reducing firearm-related violence and fatalities. This work highlights the importance of addressing root causes, such as socioeconomic disparities, alongside legislative reforms to create a safer society.

Patient-Oriented and Epidemiology Projects

Poster Snapshot

Concealed Carry Legislation and Firearm-Related Deaths in the United States: Possible Causes and Ramifications

Amelia Liu, Kyle Willette, Jeanette Manger
Wright State University Boonshoft School of Medicine

Boonshoft School of Medicine
WRIGHT STATE UNIVERSITY

Background

Prior studies have demonstrated that constitutional carry legislation and firearm-related mortality are largely influenced by socioeconomic factors and geographic location within the United States. The most significant contributors to firearm deaths, homicides, and suicides include political affiliation, degree of urbanization, and poverty levels.

This study aims to evaluate whether the enactment of constitutional carry laws affects firearm-related death and violent crime rates at the state level. We also considered potential confounding social determinants of health, including socioeconomic status, educational attainment, and unemployment rate.

Methods

Data was obtained from the County Health Rankings (CHR) from years 2016 to 2022. However, some data from the 2016 set may have originated as early as 2013. Kentucky, Oklahoma, and South Dakota were selected as study states due to the availability of relevant data and the timing of their implementation of concealed carry laws.

CHR data was collected using state and national census sources, then standardized and weighted accordingly. For this study, concealed carry (CC) was defined as the unrestricted right to carry a handgun. Firearm-related deaths were defined as fatalities involving a firearm, as documented in police or medical records.

Results

Figure 1: Correlation Between Firearm Fatality and Median Household Income in States with CC 2022

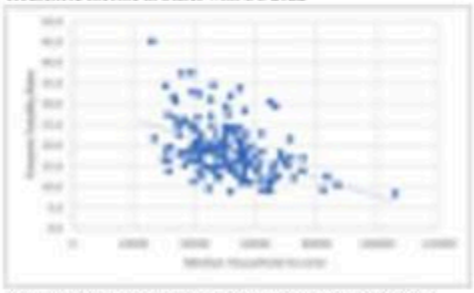
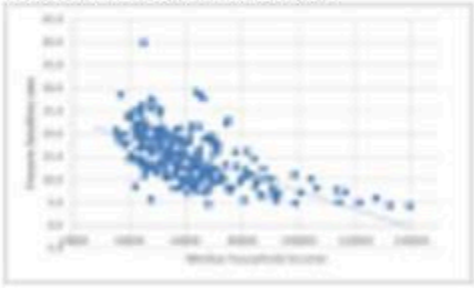


Figure 2: Correlation Between Firearm Fatality and Median Household Income in States without CC 2022



Conclusions

This study examined whether social determinants of health (SDOH)—including median income, high school completion, and unemployment—help explain firearm fatality rates. While all correlations were statistically significant, they were relatively weak ($r = -0.140$ to -0.591), reflecting the complexity of firearm-related deaths.

Regression analysis showed that SDOH explained 26% of the variance in firearm fatalities in states with constitutional carry (CC) laws and 54% in states without. This suggests that CC laws may have a stronger influence on firearm fatalities than SDOH factors alone. Although causation cannot be inferred, the difference in correlation highlights the potential impact of CC legislation.

Literature Cited

72

Demographic Differences in Cognitive Decline: An Analysis of U.S. BRFSS Data on Age, Gender, Ethnicity, and Region

Nursen Arslanyilmaz[1]
[1]Youngstown State University

Biography: *Nursen Arslanyilmaz is a junior in the enhanced Pre-Medical program at Youngstown State University (YSU) and serves as Vice President of YSU's Alzheimer's Foundation of America chapter. She has shadowed physicians across various specialties, including ophthalmology, dermatology, and pediatrics. Her volunteer experience spans numerous healthcare organizations, such as the American Red Cross, Mercy Health St. Elizabeth Hospital, the Rescue Mission, and the Butler Institute of American Art. Recognized on the YSU STEM Dean's List multiple times, Nursen has received state-level awards for her science projects. She had a presentation ranked 2nd best Physics, Chemistry, Engineering, or Math project at the District 15 Lake-to-River Science Day in Ohio and was ranked Superior (Rankings: Superior, Excellent, Good) for a project entitled 'Brain's Reaction to Video Games' at the Ohio State Science Day (06/03/2022). She is the Art-Design Author of a graphic abstract for Safety Journal (Vol. 6, Issue 1, 2020), accompanying an article on hazard warning systems for young drivers. Her goal is to become a physician dedicated to providing compassionate, empathetic care to her patients.*

Abstract

Background: This study examined health-related data from U.S. residents collected via the Behavioral Risk Factor Surveillance System (BRFSS) 1 and made publicly available for research purposes.

Methods: The dataset analyzed is comprised of 23,949 responses after preprocessing 284,144 responses to four questions about participants' cognitive decline and memory loss. In addition to these mental-health responses, the survey also recorded participants' region of residence in the United States, age group, ethnicity, and gender. This study focused on studying the effect of ethnicity, gender, age group, and region of residence on participants' subjective responses to the four questions related to their mental health.

Results: The results showed that regions of residence, gender, race/ethnicity, and age had a statistically significant effect on subjective declaration of dementia, as revealed in the four mental health responses. Specifically, residents of the Northeast (37.63%), Native American/Alaskan Natives (40.68%), females (37.09%), and those aged 65 or older had the highest percentages of cognitive decline, while residents of the West (35.76%), Asian/Pacific Islanders (34.17%), males (34.33%), and those aged 50 to 64 reported the lowest percentage in response to the four mental-health questions.

Conclusion: This study reveals gaps in cognitive decline and memory loss as early signs and critical symptoms of dementia across regions of residence, race/ethnicity, gender, and age groups. These findings indicate the need for new or revised healthcare policies, specifically targeted approaches to close the gap in the diagnosis and treatment of dementia across these groups. The results emphasize the importance of prioritizing policies to close the disparities by enhancing early detection and intervention based on the regions of residence, race/ethnicity, gender, and age, reducing barriers to care, and addressing inequities in these groups.

Inspiration: My passion for this research is driven by the inconclusive findings and the need in the literature to explore how ethnicity, region of residence, gender, and age affect dementia. Further research into these and other contributing factors, such as education, healthcare access, socioeconomic status, cultural factors, occupation, income, quality of life, and health insurance, will be important in closing the gaps in identifying and treating dementia across these different groups.

Patient-Oriented and Epidemiology Projects

Poster Snapshot

Demographic Differences in Cognitive Decline: An Analysis of US BRFSS Data on Age, Gender, Ethnicity, & Region

Nursen Arslanyilmaz

Youngstown State University

OBJECTIVES

This study examined health-related data from U.S. residents, collected via the Behavioral Risk Factor Surveillance System (BRFSS). The dataset analyzed is comprised of 23,949 responses after preprocessing 284,144 responses to four questions about participants' cognitive decline and memory loss. The survey also recorded participants' region of residence, age group, ethnicity, and gender. This study focused on the effect of ethnicity, gender, age group, and the region of residence on participants' subjective responses to the four questions related to their mental health. The results will help clarify the impact of demographics (gender, race/ethnicity, and region of residence) on dementia, providing valuable input for policymakers to develop plans aimed at reducing racial/ethnic, regional, and gender disparities in both the diagnosis and treatment of dementia.

RESEARCH METHODS & PROCEDURES

Data from the 2022 National Health Interview Survey were used to calculate the percentage of noninstitutionalized older adults with a dementia diagnosis. Information was self-reported through phone survey. The respondents are identified by age, gender, race/ethnicity, and region of residence. The four questions on the survey related to dementia are as follows.

Question 1: Percentage of older adults who reported subjective cognitive decline or memory loss that is happening more often or is getting worse in the preceding 12 months.

Question 2: Percentage of older adults who reported subjective cognitive decline or memory loss that interferes with their ability to engage in social activities or household chores.

Question 3: Percentage of older adults who reported that as a result of subjective cognitive decline or memory loss that they need assistance with day-to-day activities.

Question 4: Percentage of older adults with subjective cognitive decline or memory loss who reported talking with a health care professional about it.

284,144 responses were preprocessed to remove records without data available for any of the four dementia-related questions. Records for 35 out of 39 questions unrelated to cognitive decline were excluded. Also, responses on race/ethnicity and gender were categorized separately. All records of residence that did not fall into one of the four identified regions (Northeast, South, Midwest, and West) were excluded. 23,949 records remained and analyzed.

DATA ANALYSIS

Comparisons were made between groups categorized by ethnicity, age, gender, and region of residence to examine their impact on dementia. To this end, four separate ANOVA tests were conducted. Dementia, as the dependent variable, was measured based on responses to the four questions treated as a single construct. The ANOVA tests individually assessed the impact of four independent variables: age, ethnicity, gender, and region of residence, on dementia. The categorical values for the independent variables are as follows: for age, "50-64" and "65 or older"; for ethnicity, "Native American/Alaskan Native," "Asian/Pacific Islander," "Black," "White," and "Hispanic"; for gender, "Male" and "Female"; and for region of residence, "Northeast," "South," "Midwest," and "West." The significance level was set at 0.05.

CONCLUSIONS

This study examined how ethnicity, region, gender, and age influence self-reported cognitive decline and memory loss using BRFSS data. Ethnicity showed a statistically significant effect, with Native American/Alaskan Native respondents reporting the highest rates and Asian/Pacific Islanders the lowest. Regional differences were also significant, with the Northeast and South showing higher reported decline than the West. Gender analysis revealed females reported higher rates of cognitive issues than males, aligning with some previous research. However, the study's findings sometimes conflicted with earlier research that used diagnosed dementia data rather than subjective self-reports. Small effect sizes suggest these demographic factors account for only a limited portion of the variance in responses, pointing to the influence of other variables like education, socioeconomic status, and healthcare access. The results underscore the need for targeted healthcare policies and further research using objective diagnostic tools to better understand and address disparities in dementia-related outcomes.

REFERENCES

1. CDC - BRFSS [Internet]. 2024 [cited 2024 Sep 18]. Available from: https://www.cdc.gov/brfss/index.html
2. What Is Dementia? Symptoms, Types, and Diagnosis [Internet]. National Institute on Aging. 2022 [cited 2024 Sep 18]. Available from: https://www.nia.nih.gov/health/alzheimers-and-dementia/what-dementia-symptoms-types-and-diagnosis
3. Jennifer J. Manly, Richard Mayeux. Ethnic Differences in Dementia and Alzheimer's Disease. In: Anderson NB, Bulatao RA, Cohen B, editors. Critical Perspectives on Racial and Ethnic Differences in Health in Late Life [Internet]. National Academies Press (US); 2004 [cited 2024 Sep 18]. p. 95–141. (Panel on Race, Ethnicity, and Health in Later Life, National Research Council). Available from: https://www.ncbi.nlm.nih.gov/books/NBK25535/
4. Kornhuber J, Bohnert A, Boscarelli WJ, Xia F, Barnes DE, Yaffe K. Association of Race and Ethnicity With Incidence of Dementia Among Older Adults. JAMA. 2022 Apr 19;327(15):1488–95.
5. Mayeda ER, Glymour MM, Quesenberry CP, Whitmer RA. Inequalities in dementia incidence between six racial and ethnic groups over 14 years. Alzheimers Dement J Alzheimers Assoc. 2016 Mar;12(3):216.
6. Priyanka Singh, Jessica P. Lendon, Monisha Sengupta. Alzheimer Disease or Other Dementias in Adult Day Services Centers, 2020 [Internet]. 2024 Jun. (National Health Statistics Reports). Report No.: 198. Available from: www.cdc.gov/nchs/data/nhsr/nhsr198.pdf
7. Zacher M, Brady S, Short SE. Geographic Patterns of Dementia in the United States: Variation by Place of Residence, Place of Birth, and Subpopulation. J Gerontol B Psychol Sci Soc Sci. 2023 Mar 9;78(7):1192–205.
8. Ellen A. Kramarow. Diagnosed Dementia in Adults Age 65 and Older: United States, 2022 [Internet]. National Health Statistics; 2024 Jun. (National Health Statistics Reports). Report No.: 203. Available from: https://www.cdc.gov/nchs/data/nhsr/nhsr203.pdf
9. Beam CR, Kaneshiro C, Jang JY, Reynolds CA, Pedersen NL, Gatz M. Differences Between Women and Men in Incidence Rates of Dementia and Alzheimer's Disease. J Alzheimers Dis JAD. 2018;64(4):1077
10. Gong J, Harris K, Lipnicki DM, Castro-Costa E, Lima-Costa MF, Diniz BS, et al. Sex differences in dementia risk and risk factors: Individual-participant data analysis using 21 cohorts across six continents from the COSMIC consortium. Alzheimers Dement. 2023;19(8):3365–78.
11. Anstey KJ, Peters R, Mortby ME, Kiely KM, Eramudugolla R, Cherbuin N, et al. Association of sex differences in dementia risk factors with sex differences in memory decline in a population-based cohort spanning 20–76 years. Sci Rep. 2021 Apr 8;11(1):7710.
12. Centers for Disease Control and Prevention. Alzheimer's Disease and Healthy Aging Data [Internet]. https://data.cdc.gov/Healthy-Aging/Alzheimer-s-Disease-and-Healthy-Aging-Data/ Available from: National Center for Chronic Disease Prevention and Health Promotion, Division of Population Health. Healthy Aging Data; [cited 2024 Sep 18]. Available from: https://data.cdc.gov/Healthy-Aging/Alzheimer-s-Disease-and-Healthy-Aging-Data/hfh9-rsnv/about_data
13. Field A. Discovering Statistics Using IBM SPSS Statistics, 4th Edition. 4th edition. SAGE Publications Ltd; 2013. 915 p.

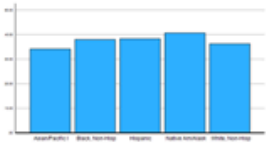
RESULTS

Responses by Location, Age, Gender, Race/Ethnicity

		N
Location	Northeast	5944
	Midwest	5970
	South	5978
	West	6057
Age Group	50-64 years	8003
	65 years or older	7884
Gender	Female	2937
	Male	2913
Race/Ethnicity	Asian/Pacific I	2829
	Black, Non-Hisp	3074
	Hispanic	3068
	Native Am/Alask	2942
	White, Non-Hisp	3093

Race/Ethnicity on Cognitive Decline

Race Ethnicity	Mean	Std. Deviation	N
Asian/Pacific I	34.171	28.143	2829
Black, Non-Hisp	38.037	24.530	3074
Hispanic	38.340	24.030	3068
Native Am/Alask	40.680	24.094	2942
White, Non-Hisp	36.257	24.880	3093



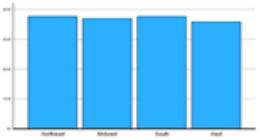
ANOVA revealed a statistically significant main effect for race and ethnicity ($F(5, 23{,}943) = 26.387$, $p < 0.01$; partial eta squared = 0.005; power = 1.00) on the four questions related to the dementia.

- Asian/Pacific Islanders were significantly different from all other racial and ethnic groups but not from White Non-Hispanics.
- Black Non-Hispanics were significantly different from Asian/Pacific Islanders but not from Hispanics or White Non-Hispanics.
- Hispanics were significantly different from all other groups except for Black Non-Hispanics. Native Americans were significantly different from all other groups.
- The White Non-Hispanic population was different from Hispanics and Native American/Alaskan Natives, but not from Asian/Pacific Islanders or Black Non-Hispanics.

However, the small effect size ($\eta^2 = 0.005$) suggests other factors, such as socioeconomic status or access to healthcare, may contribute to the variance in the responses to these questions.

Region of Residence on Cognitive Decline

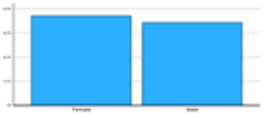
Location	Mean (percentage)	Std. Deviation	N
Northeast	37.627	25.334	5944
Midwest	36.908	25.158	5970
South	37.593	24.383	5978
West	35.761	24.622	6057
Total	36.967	24.886	23949



ANOVA revealed that the region of residence had a statistically significant impact on respondents' answers to the four questions related to their cognitive decline or memory loss ($F(3, 23{,}945) = 7.415$, $p < 0.01$; partial eta squared = 0.001; power = 0.986)). However, the small effect size ($\eta^2 = 0.001$) suggests limited practical impact. That is, the region has an impact on mental health, but other factors likely play a larger role.

Gender on Cognitive Decline

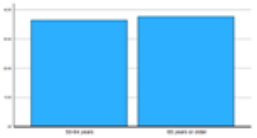
Gender	Mean	Std. Deviation	N
Female	37.090	24.263	2937
Male	34.334	24.294	2913



ANOVA showed that females experience cognitive decline and memory loss at a statistically significantly higher rate than males ($F(2, 23{,}946) = 18.745$, $p < 0.01$; partial eta squared = 0.002; power = 1.00) as shown in their positive responses to the four questions. However, the small effect size ($\eta^2 = 0.002$) indicates, while gender differences exist, they do not substantially explain the variability in the responses to the questions related to cognitive decline and memory loss.

Age on Cognitive Decline

Age Group	Mean	Std. Deviation	N
50-64 years	36.399	23.920	8003
65 years or older	37.599	26.368	7884



ANOVA shows a statistically significant difference between these two age groups ($F(1, 15{,}885) = 9.03$, $p = 0.003$; partial eta squared = 0.001; power = 0.852). This indicates that respondents aged 65 or older experienced cognitive decline and memory loss at a statistically significantly higher rate than those younger than 65.

73

Development of an AI-assisted mobile application for improving polypharmacy management, medication adherence, and patient education in outpatient settings

Pavitra Attanayake[1], **Jory Nagel**[2], **Nathaniel Hagan**, Mr. Nicholas Warriner, Joseph Mariscal[1], Dr. Mark Trottier[1]
[1]Michigan State University College of Human Medicine, [2]Western Michigan University Homer Stryker MD School of Medicine

Biography: *Pavitra Attanayake is a third-year medical student at Michigan State University College of Human Medicine, with a Background in Biomedical Engineering from Michigan Technological University. Her interdisciplinary research focus centers on technological innovations in patient care management, with particular emphasis on geriatric healthcare solutions. Jory Nagel is a first-year medical student at Western Michigan University Homer Stryker School of Medicine, holding a Bachelor of Science in Biological Sciences. Nagel's research interests encompass medication management systems and patient safety interventions for complex medical populations.Nathaniel Hagan is a software engineer with advanced credentials in Computer Science from Michigan State University and the University of Colorado Boulder, including a graduate certificate in Artificial Intelligence. Hagan specializes in machine learning applications and computational approaches to healthcare technology development.*

Abstract

Background: Polypharmacy, the use of five or more medications by an individual, is an increasingly prevalent and concerning issue in healthcare affecting 65.1% (37.8 million) of US geriatric patients. The management of polypharmacy presents complex challenges that can lead to medication mismanagement and adverse health outcomes.

Smartphone applications hold enormous potential to overcome these issues. While existing apps assist patients through features including reminder systems, adherence logging, and manual pill identification, there is room for advancement in areas such as individualized care management and artificial intelligence integration to minimize human error in medication adherence. This study aimed to create a prototype smartphone application, Polly, to support polypharmacy management by combining traditional medication management tools with real-time machine vision verification. The app's goals include improving adherence, increasing patient comprehension, and reducing adverse drug events.

Methods: Polly was built using the Flutter framework for cross-platform compatibility, with a backend supported by FastAPI and hosted on Microsoft Azure. The machine vision capabilities were developed using the Ultianalytics YOLOv8 model that was trained on 697 images of pills taken from the National Institute of Health's Computational Photography Project for Pill Identification archive, publicly available images from Google, and photographs taken by the researchers. Validation testing was performed using 124 additional images.

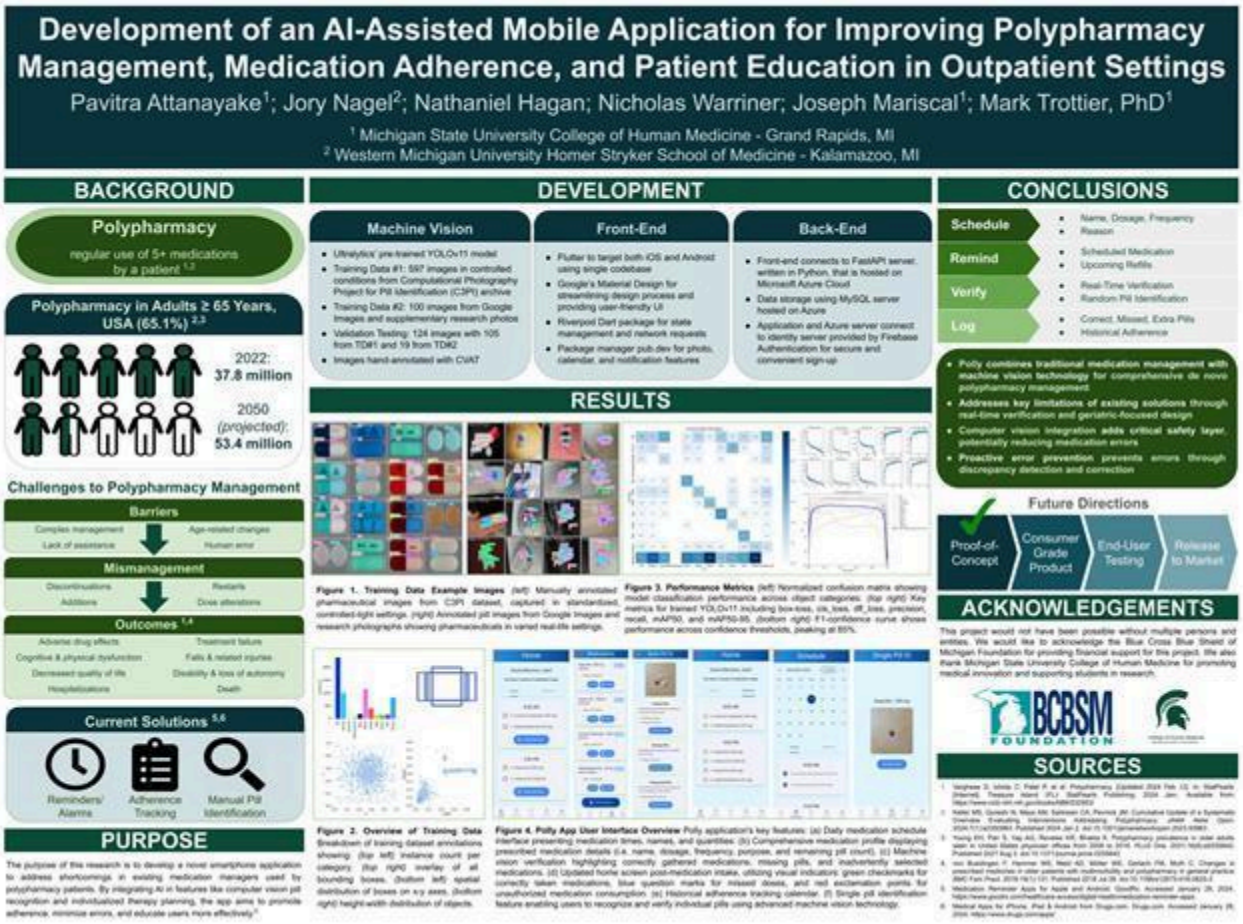
Results: Validation testing of the YOLOv8 model resulted in a precision of 84.49%, recall of 83.71%, and a mean Average Precision at an intersection-over-union (IoU) threshold of 0.5 (mAP50) of 81.24%. When evaluated across a range of IoU thresholds from 0.5 to 0.95 (mAP@50-95), the model scored 83.75%. Heuristic post-processing further increased real-world predictive performance.

Conclusion: The Polly mobile application was successfully prototyped with several key features including a daily medication list, medication input/scheduling, medication and refill reminders, pill verification, adherence tracking, and as-needed pill identification. Each feature focuses on user-friendliness, accessibility, and practical utility for patients managing complex medication regimens.

Inspiration: The development and prototyping of Polly demonstrates the feasibility of combining traditional medication management tools with advanced machine vision technology to create a comprehensive solution for polypharmacy management. The application successfully addresses several key limitations of existing medication management solutions, particularly through its innovative real-time verification system and user-centric design approach for geriatric populations. The innovation behind Polly allows for increased patient care and safety standards while also promoting patient empowerment and education.

Patient-Oriented and Epidemiology Projects

Poster Snapshot



74

Digital Age Headaches: Exploring the Neurological Impact of Screen Time and Blue Light

Israel Ihunda[1], Mr. Tamaratubor Ambah[1], Mr. Favour Enoch Abidoye[1], Mr. Cejay Alexi McCalla[1], Mr. Mololuwa Kalejaiye[1]
[1]All Saints University School of Medicine, Dominica

Biography: *Israel Ihunda is a 2nd year medical student at All Saints University School of Medicine Dominica. He is currently the president in his local AMSA chapter and has formerly served as the assistant health fair coordinator in his chapter. Israel Ihunda has volunteered for several community services in Dominica, and he is very devoted in helping medical students in any way when needed. He has interest in general surgery and public health*

Abstract

Background: The prevalence of headaches among screen users significantly impacts productivity and well-being. This study evaluates the relationship between screen time and headaches while proposing preventive measures.

Method: An online survey was conducted among diverse participants to ensure representative data and minimize biases. Anonymity was maintained to encourage honesty.

Results: Of the 259 respondents, 54.8% were female, 44.8% male, and 57.9% aged 20-30. Daily screen time of 7-9 hours was reported by 30.5%, and 90% experienced headaches, primarily frontal (57.5%). Stress due to school or work was high (84.9%), with 53.9% reporting headaches "sometimes." Screen habits included 51.9% maintaining brightness above 30% and 80.7% using screens in dark environments. The primary screen usage reasons were work (38.2%), leisure (35.5%), and school (26.3%). Common medical conditions reported included Migraine, Myopia, Anxiety, and PCOS. Correlation analysis showed a strong positive link between screen time and headache duration ($r = 0.75$, $p < 0.001$) and between age and headache region ($r = 0.83$, $p < 0.001$), with younger individuals prone to frontal headaches. Stress correlated moderately with headache frequency ($r = 0.56$, $p < 0.01$). Using blue-light glasses reduced headache duration ($r = -0.45$, $p < 0.05$).

Conclusion: This study underscores the impact of prolonged screen time, stress, and screen habits on headaches. Awareness and strategies like healthy screen practices and stress management can mitigate these issues. Further research should explore causal relationships and interventions to alleviate screen-related health concerns.

Inspiration: The increasing use of digital screens has led to a rise in complaints of headaches, yet there is insufficient data to establish a clear relationship between screen time, blue light exposure, and neurological effects. Many individuals experience frequent headaches after prolonged screen use, but the underlying mechanisms remain poorly understood. Existing research primarily focuses on eye strain and sleep disturbances, leaving a gap in understanding the direct neurological impact. This lack of comprehensive studies inspired me to explore how prolonged exposure to digital screens affects brain function and contributes to headaches. By investigating this issue, I hope to provide evidence-based insights that can help develop better guidelines for screen use and potential preventive measures. As screen time continues to increase globally, addressing its neurological implications is essential for both public health and everyday well-being.

Patient-Oriented and Epidemiology Projects

Poster Snapshot

Digital Age Headaches: Exploring the Neurological Impact of Screen Time and Blue Light

Tamaratubor Ambah*, Favour Enoch Abidoye, Cejay Alexi McCalla, Mololuwa Kalejaiye, Israel Chiayinweze Ihunda (presenter)

American Medical Student Association
All Saints University School of Medicine Chapter

Objectives

- Assess the **relationship between screen time and headache patterns** (duration, location, frequency).
- Identify the role of **screen habits** (brightness, blue-light filter, environment).
- Evaluate the effect of **stress** and underlying **medical conditions**.
- Recommend **preventive strategies** to mitigate screen-induced headaches.

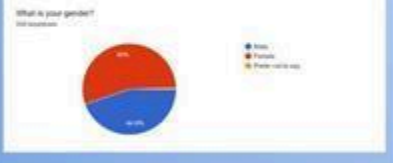
Introduction

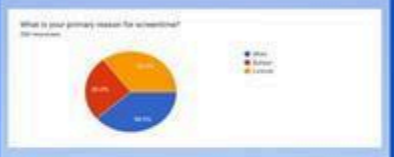
Prolonged screen time has become a common part of daily life, leading to increased reports of headaches among users. This study explores the link between screen time, stress, and headaches, highlighting key patterns and potential preventive measures. By understanding these relationships, we aim to promote healthier screen habits and reduce screen-related health issues.

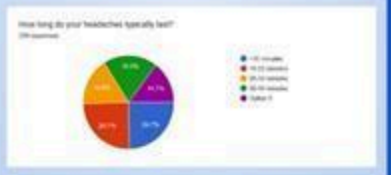
Methods

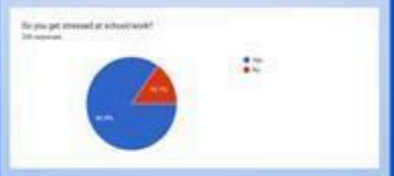
- **Design:** Cross-sectional study using an online survey.
- **Participants:** 260 individuals aged 18–50+ from various backgrounds.
- **Tool:** Structured questionnaire covering demographics, screen habits, stress levels, headache characteristics, and preventive practices.
- **Data Privacy:** Anonymity maintained to ensure honest responses.
- **Analysis:** Pearson correlation coefficient (r) and p-values used to assess relationships.

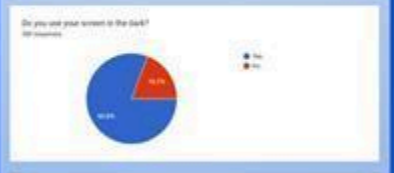
Results

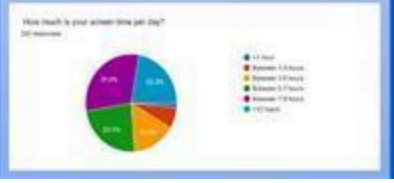












Correlation Analysis

- **Screen Time & Headache Duration**: $r = 0.75$, $p < 0.001$
  More screen time → Longer headaches.
- **Age & Headache Location**: $r = 0.83$, $p < 0.001$
  Younger age → Frontal headaches.
- **Stress & Headache Frequency**: $r = 0.56$, $p < 0.01$
  Higher stress → More frequent headaches.
- **Blue-Light Glasses & Headache Duration**: $r = -0.45$, $p < 0.05$
  Blue-light glasses → Shorter headaches.

Discussion

- **Significant link** between longer screen exposure and **prolonged headaches**.
- **Younger participants** are more likely to experience **frontal headaches**, likely due to poor posture and proximity to screens.
- **High stress levels** amplify the frequency and intensity of headaches.
- Participants who used **blue-light glasses** or limited brightness reported **shorter headache duration**.
- Use of screens in **dark environments** likely contributes to **eye strain and tension headaches**.

Conclusion

- Headaches are **strongly associated** with screen habits and stress.
- **Modifiable factors** such as screen brightness, ambient lighting, blue-light filters, and posture should be addressed.
- Educational awareness about **screen hygiene** and **stress management techniques** can help reduce headache burden.

Recommendations

- Limit screen time or follow the **20-20-20 rule**.
- Use **blue-light glasses/filters** at night.
- Avoid using screens in the dark.
- Adjust **screen brightness** and maintain good posture.
- Practice **stress-reducing habits** like exercise and breaks.
- Support further research on **interventions** and long-term outcome

75

Discordance among apoB, HDL-C, and LDL-C as a Predictor of MACE

Maeve Shannahan[1]
[1]Emory University

Biography: *The author is an undergraduate student at Emory University. Shannahan is a third year Neurobiology and Behavioral Biology (NBB) student planning to attend medical school.*

Abstract

Background: Cardiovascular disease (CVD) remains a leading cause of morbidity and mortality globally, particularly in individuals with a history of major adverse cardiovascular events (MACE), such as heart attack (myocardial infarction) and stroke. Secondary prevention strategies aim to reduce the likelihood of subsequent events, with traditional lipid biomarkers like low-density lipoprotein cholesterol (LDL-C) and high-density lipoprotein cholesterol (HDL-C) being central to risk assessment. However, emerging evidence suggests that apolipoprotein B (apoB), a marker of atherogenic lipoprotein particle number, may provide superior predictive value for CVD risk. Lipid discordance, the mismatch between traditional lipid measures (LDL-C, HDL-C) and apoB, may lead to underestimation of cardiovascular risk when relying solely on LDL-C. Investigating whether lipid discordance predicts MACE differently between men and women is crucial for developing sex-specific risk management strategies.

Methods: The study utilized data from the (Blinded) Cardiovascular Biobank (XCAB), which includes a diverse cohort of individuals who have experienced a MACE. We analyzed lipid profiles, focusing on apoB, LDL-C, and HDL-C. Clinical outcomes related to subsequent MACE were tracked over a defined follow-up period. The analysis was stratified by sex to investigate sex-specific differences in lipid discordance and MACE risk. Multivariate regression analyses were conducted to assess the association between discordant lipid profiles and MACE risk, controlling for confounders such as age, comorbidities, and medication adherence.

Results: Preliminary results suggest that discordance between apoB and traditional lipid measures is associated with an increased risk of recurrent MACE. Sex-specific patterns of discordance were observed, with men and women displaying different lipid profiles and discordance patterns. The predictive value of lipid discordance for MACE risk was stronger in some subgroups, indicating that lipid discordance could be a more precise indicator of cardiovascular risk compared to traditional lipid measures alone.

Conclusion: The findings support the hypothesis that lipid discordance, particularly between apoB, LDL-C, and HDL-C, plays a significant role in predicting MACE risk for secondary prevention. Ethical considerations for this study include the use of de-identified data from the XCAB, with participant consent obtained for the use of clinical data in research.

Inspiration: Sex-specific differences in lipid discordance patterns suggest that tailored strategies for managing cardiovascular risk may improve outcomes for both men and women. The results highlight the potential of lipid discordance as a more reliable marker for risk stratification, emphasizing the need for a re-evaluation of traditional lipid measures in cardiovascular management.

Patient-Oriented and Epidemiology Projects

77

Emergency Room Visits of Incarcerated Individuals in Texas: A Retrospective Analysis of Trauma-Related Admissions and Health Implications

Sonya Bhatia[1], Andrea Argenal[1], Sowmya Duddu[1], Julia Paz[1], Tori Sayers[1], Dr. Bharathi Gadad[1], Dr. Kelsey Baker[1]
[1]University of Texas Rio Grande Valley SOM

Biography: *Sonya is a second year medical student at the University of Texas Rio Grande Valley Medical School. She is a queer woman of color interested in LGBTQ+ health, harm reduction, and incorporating justice into patient care.*

Abstract

Introduction: In 2024, the United States has the highest incarceration rate of any independent democracy. Texas has a higher incarceration rate than the US national average, with an incarceration rate of 751 people imprisoned per 100,000 citizens. Additionally, Texas prisons have become severely overcrowded. Overcrowding has exacerbated the lack of adequate medical care for prisoners, and prisons' hostile and ultimately unsafe environment. Despite the health risks, little research has been done on the utilization of emergency room visits by incarcerated individuals.

Methods: A retrospective statistical analysis was done on a sample of 1272 incarcerated patients who were admitted in 2021 to a Texas Emergency Department for trauma related causes. Patients were then analyzed for demographics, comorbidities, AIS code, and injury diagnosis based on data.

Results: In terms of patient demographics, 81% were male and 19% were female, with an average age of 40 years old. The majority of patients were White (60.2 %), and the second highest racial demographic was Black/African American (30.9%). Smoking was the most common comorbidity of those with a comorbidity. The leading cause of injury was assault by unarmed fight with the most frequent injury diagnosis as scalp contusion; these results were consistent with the most common AIS code: hematoma.

Conclusion: The patients in our study were mainly males, with an average age of 40. This is consistent with current research; one study found that among incarcerated adults, men under 65 years had the highest proportion of assault-related ED visits. The most common comorbidity in our analysis was smoking; there were many other comorbidities cited such as mental health disorders, hypertension and substance use disorder. There have been many studies that find substance use and mental illness are overrepresented in and disproportionally affect US prisons. Finally, the most common injury diagnosis and AIS code were contusion of scalp and hematoma. These brain injuries can have long-lasting health impacts, such as further injury, infection and cognitive impairment.

Inspiration: The history and context of the US carceral system shows that prisons are punitive, dehumanizing, and violent environments. Institutional prison factors such as overcrowding have been shown to have a significant correlation with prison violence. Our study's findings necessitate further exploration into legal changes, such as decriminalization, to improve prison conditions in Texas, like overcrowding. These systemic measures could create an environment that decreases prison assault cases and thus, potentially minimize the amount of ED visits among those incarcerated.

Patient-Oriented and Epidemiology Projects

79

Liberal versus Restrictive blood transfusion in patients with traumatic brain injury: A meta-analysis of randomized controlled trials

Ogechukwu Obi[1], Pawel Lajczak, Uchenna Nweze, Patricia Asonye
[1]New York Institute of Technology College of Osteopathic Medicine

Biography: *Ogechukwu Samuel Obi is a current a third year medical student of NYITCOM class of 2026. He completed his Bachelor of Science in Applied Biochemistry in Nigeria, followed by a post-baccalaureate degree at Washington University at St Louis Missouri. He is interested in pursuing a career in Internal Medicine following graduation, with an eventual fellowship in Cardiology.*

Abstract

Background: Data regarding the efficacy and safety of liberal blood transfusion strategy (transfusions initiated at ≤ 10g per deciliter) versus restrictive blood transfusion strategy (transfusions initiated at ≤ 7g per deciliter) on clinical outcomes in patients with traumatic brain injury (TBI) are limited.

Method: PubMed, Scopus, and Cochrane databases were systematically searched for randomized controlled trials (RCTs) comparing liberal and restrictive blood transfusion in patients with TBI, with primary outcomes of Intensive care unit (ICU) and in-hospital mortalities. We pooled risk ratio (RR) and mean difference (MD), along with their 95% confidence intervals (CIs), with a random-effect model.

Results: We included 5 RCTs consisting of 1867 patients, of which 926 (49.6%) received liberal blood transfusion and 941 (50.4%) received restrictive blood transfusion. The mean age of these patients ranged from 57.4 ± 13.2 years and most of the patients were men (80.1%). The pooled risk ratio analysis showed that the primary outcomes in-hospital ($p = 0.518$) and ICU mortalities ($p = 0.531$) were not statistically different between groups. Similarly, pulmonary embolism ($p = 0.310$), pneumonia ($p = 0.626$), DVT ($p = 0.152$), ARDS ($p = 0.291$), ICU length of stay ($p = 0.49$), MI ($p = 0.336$), surgical site infection ($p = 0.480$), stroke ($p = 0.250$) and hospital length of stay ($p = 0.15$) are not statistically different between groups. However, liberal transfusion strategy significantly reduced the incidence of sepsis or septic shock ($p = 0.033$), while restrictive blood transfusion strategy reduced the amount of red blood cell units transfused per patient ($p < 0.01$).

Conclusion: In patients with TBI, a liberal blood transfusion strategy did not reduce in-hospital or ICU mortality, ICU/hospital stay, or complications like pneumonia, PE, DVT, ARDS, AMI, stroke, or surgical site infections. However, it was associated with a reduced incidence of sepsis or septic shock.

Inspiration: Researching liberal versus restrictive blood transfusion strategies in patients with traumatic brain injury (TBI) through a meta-analysis of randomized controlled trials is essential to optimize care for this vulnerable population. TBI patients often face unique hemodynamic and neurological challenges, and transfusion strategies may influence outcomes like mortality, infections, and recovery time. While liberal transfusions may improve oxygen delivery, they also carry risks like infection or immunosuppression. A comprehensive meta-analysis can clarify the comparative effectiveness and safety of these strategies, providing evidence-based guidance to refine transfusion protocols and improve clinical outcomes for TBI patients.

Patient-Oriented and Epidemiology Projects

80

Mitigating Suicide Risk: The Impact of Social Connectedness and Daily Functioning in Psychiatric Patients with Substance Use Disorders or a History of Trauma

Sirapa Vichaikul[1], PhD Evonne Edwards[1,2], PhD Tracy Koehler[2]
[1]Michigan State University College of Human Medicine, [2]Pine Rest Residency and Fellowship

Biography: *Sirapa Vichaikul is a 2nd year medical student at MSU College of Medicine. She graduated from the University of Michigan with a degree in Neuroscience and a minor in Gender and Health. She is interested in health equity and advocating for healthcare for the underserved community. During her gap year, she decided to serve as an AmeriCorps with the San Francisco Department of Public Health. In this role, she developed a patient navigation program for patients in shelter health and street medicine clinics to help increase engagement in primary care and access to specialty care. During her time in medical school, she continued to volunteer with Grand Rapids Street Medicine and serve on the executive board of her local chapter of the Asian Pacific American Medical Student Association. Collaborating with community partners, she helped run a community preventative clinic for Asian communities and researched the effectiveness of culturally sensitive community-based mental health educational presentations and the role of cultural influences in mental health-seeking behavior. In her free time, she enjoys doing arts and crafts, cooking, hiking, and spending time with friends and family.*

Abstract

Background: Although relationships between social connectedness, psychiatric diagnoses, trauma history, and suicide risk are well documented, further exploration is needed regarding the protective effects of social connectedness and daily functioning against suicidal thoughts and behaviors within specific at-risk populations. Studies are particularly needed on individuals recently discharged from high-acuity psychiatric treatment settings who have a substance use disorder (SUD) or history of trauma due to the substantial suicide risk conferred by these risk factors.

Methods: This study will utilize a deidentified dataset of patients recently discharged from psychiatric inpatient, partial hospital, and urgent care settings to examine associations between elevated suicide risk and social connectedness, daily functioning, trauma history, SUD diagnosis, and other risk factors. Data was collected as part of a clinical services grant program through the use of Substance Abuse and Mental Health Services Administration's (SAMHSA's) National Outcome Measures (NOMs) Client-Level Services tool. Study variables include patient demographics, psychiatric diagnoses, housing stability, educational attainment, employment status, a 5-item measure of social connectedness, a 6-item measure of daily functioning, and suicide risk level, as measured by Columbia-Suicide Severity Rating Scale scores.

Results: We hypothesize that higher social connectedness and daily functioning will be associated with a decreased likelihood of elevated suicide risk, with an increased protective effect for those with a SUD or history of trauma. Demographic and social disparities of health (SDOH) variables will be analyzed to assess suicide risk disparities.

Conclusion: Results from this study will be used to inform suicide risk mitigation efforts targeting social support and daily functioning for high-risk psychiatric patients.

Inspiration: I am interested in studying this topic because social isolation and impaired functioning are significant, yet often overlooked, suicide risk factors. Through my experience in street medicine, where many patients struggle with co-occurring psychiatric disorders, SUDs, and other vulnerabilities, I witnessed firsthand how these factors intersect and contribute to suicide risk. Additionally, as an Asian-identifying individual, I have seen how cultural stigma surrounding mental health can isolate individuals from their social support systems, further exacerbating their distress. These experiences have deepened my commitment to understanding the role of social connection and daily functioning in suicide prevention. By exploring these relationships, I hope to help healthcare professionals better identify at-risk individuals and develop equitable, culturally sensitive interventions that address the social dimensions of mental health.

Patient-Oriented and Epidemiology Projects

81

Orthopedic Burden of Pedestrian Road Injuries: Analyzing Sex Differences in Mortality, YLLs, and HDI Correlations in Georgia, Syria, and Tajikistan Over Three Decades

Britney Shaw[1], Cameron J. Sabet[1], Phillip C. McKegg[2], Amber Park[3], Sai Kurapati[4], Muhammad Mustafa[5], Dang Nguyen[6], Le Huu Nhat Minh[7]
[1]Georgetown University Medical Center, [2]Department of Orthopaedic Surgery, OhioHealth Grant Medical Center, [3]Lincoln Memorial University-DeBusk College of Osteopathic Medicine, [4]Penn State College of Medicine, [5]Judy Genshaft Honors College, University of South Florida, [6]Massachusetts General Hospital, Corrigan Minehan Heart Center, Harvard Medical School, [7]International Ph.D. Program in Medicine, College of Medicine, Research Center for Artificial Intelligence in Medicine, Taipei Medical University

Biography: *As a Georgetown University Double Hoya, Britney has always been inspired by the principle of cura personalis, which drives her to look beyond the individual and consider the broader systems shaping our communities. This same commitment led her to embrace leadership in the American Medical Student Association, where she resonates with the belief that "It takes more than medical school to make a physician." Britney is deeply passionate about addressing health inequities and has dedicated herself to various leadership roles, including serving as the President of the Georgetown University School of Medicine AMSA chapter. Her passion for improving healthcare systems is fueled by her academic background as a Public Health minor, where she has cultivated a deeper understanding of the complex social determinants that impact patient health. Britney is committed to using her skills and knowledge to advance the fields of public health and clinical medicine, particularly in underserved communities.*

Abstract

Background: Pedestrian road traffic injuries (RTIs) contribute significantly to global mortality, with 1.19 million deaths annually. However, research often overlooks low- and middle-income countries undergoing urbanization, such as Georgia, Syria, and Tajikistan, where inadequate infrastructure exacerbates injury risks. This study examines epidemiologic trends in pedestrian RTIs, exploring HDI correlations to inform targeted health interventions.

Methods: A comprehensive analysis was conducted using the 1990-2021 Global Burden of Disease database, focusing on age-standardized rates of mortality, YLLs (years of life lost), and incidence of pedestrian RTIs in Georgia, Syria, and Tajikistan. The population was stratified by sex for comparative analysis. Statistical methods, including descriptive statistics, independent samples t-tests, and effect size measures, were applied to assess sex-specific differences. Temporal patterns and correlation analysis of Human Development Index (HDI) and key health outcomes were examined to identify trends to inform public health strategies.

Results: Male pedestrian mortality, YLLs, and incidence rates were nearly 2-3 times higher than those of females in Georgia and Syria. Though male pedestrians in Georgia experienced significantly higher rates of pedestrian RTIs, the relatively smaller effect sizes for mortality and YLLs suggest that while Georgian males are more frequently involved in RTIs, females tend to suffer from more severe injuries. Moreover, HDI correlations with pedestrian RTI outcomes were positive and significant in Georgia but absent in Syria and negative in Tajikistan—underscoring the intricate and region-specific interplay between socioeconomic factors and pedestrian safety.
Conclusion: Our findings highlight notable sex-specific differences in pedestrian RTIs in Georgia and Syria, where males suffer disproportionately higher mortality, YLLs, and incidence rates. To address these inequities, interventions should enhance orthopedic healthcare capacity, develop sex-specific road safety initiatives, and prioritize healthcare and infrastructure improvements tailored to the distinct needs of each nation.

Inspiration: The ubiquity of roads and transportation makes pedestrian road traffic injuries (RTIs) a universal public health issue—impacting individuals across all walks of life. Yet, despite their prevalence, RTIs remain a significant and under-recognized health crisis. Furthermore, existing literature on RTIs in Georgia, Syria, and Tajikistan has focused on specific populations, overlooking rural disparities, sex-specific differences, and socioeconomic determinants of health. This study seeks to bridge that gap by analyzing longitudinal, sex-specific trends in pedestrian RTIs, with the aim of guiding meaningful, region-specific interventions. By examining the public health implications of RTIs, we not only strive to protect individuals but also to drive lasting change—creating a healthier, safer society for all.

Patient-Oriented and Epidemiology Projects

Poster Snapshot

Orthopedic Burden of Pedestrian Road Injuries: Analyzing Sex Differences in Mortality, YLLs, and HDI Correlations in Georgia, Syria, and Tajikistan Over Three Decades

Britney Shaw BS[1*], Cameron J. Sabet[1*], Phillip C. McKegg[2], Amber Park[3], Sai Kurapati[4], Muhammad Mustafa[5], Dang Nguyen[6], Le Huu Nhat Minh[7],

[1]Georgetown University Medical Center, [2]Department of Orthopaedic Surgery, OhioHealth Grant Medical Center, [3]Lincoln Memorial University-DeBusk College of Osteopathic Medicine, [4]Penn State College of Medicine, [5]Judy Genshaft Honors College, University of South Florida, [6]Massachusetts General Hospital, Corrigan Minehan Heart Center, Harvard Medical School, [7]International Ph.D. Program in Medicine, College of Medicine, Research Center for Artificial Intelligence in Medicine, Taipei Medical University

*Co-First Authors

BACKGROUND

Pedestrian road traffic injuries (RTIs) contribute significantly to global mortality, with 1.19 million deaths annually.[1] However, research often overlooks low- and middle-income countries undergoing urbanization, such as Georgia, Syria, and Tajikistan, where inadequate infrastructure exacerbates injury risks. This study examines epidemiologic trends in pedestrian RTIs, exploring HDI correlations to inform targeted health interventions.

METHODS

A comprehensive analysis was conducted using the 1990-2021 Global Burden of Disease database[2], focusing on age-standardized rates of mortality, YLLs (years of life lost), DALYs (disability adjusted life years)and incidence of pedestrian RTIs in Georgia, Syria, and Tajikistan. The population was stratified by sex for comparative analysis. Statistical methods, including descriptive statistics, independent samples t-tests, and effect size measures, were applied to assess sex-specific differences. Temporal patterns and correlation analysis of Human Development Index (HDI) and key health outcomes were examined to identify trends to inform public health strategies.

RESULTS

Male pedestrian mortality, YLLs, and incidence rates were nearly 2-3 times higher than those of females in Georgia and Syria. Though male pedestrians in Georgia experienced significantly higher rates of pedestrian RTIs, the relatively smaller effect sizes for mortality and YLLs suggest that while Georgian males are more frequently involved in RTIs, females tend to suffer from more severe injuries. Moreover, HDI correlations with pedestrian RTI outcomes were positive and significant in Georgia but absent in Syria and negative in Tajikistan—underscoring the intricate and region-specific interplay between socioeconomic factors and pedestrian safety.

RESULTS

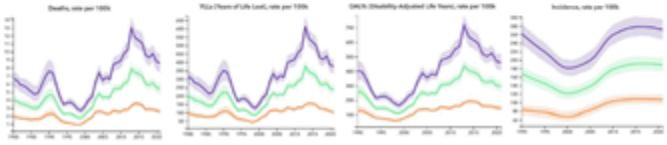


Figure 1. Sex-stratified pedestrian RTI burden in Georgia. This figure presents four age-standardized graphs illustrating mortality rate, YLLs, DALYs, and incidence rate for pedestrian RTIs in Georgia for males (purple), females (orange), and both sexes (green).

Figure 2. Sex-stratified pedestrian RTI burden in Syria. This figure presents four age-standardized graphs illustrating mortality rate, YLLs, DALYs, and incidence rate for pedestrian RTIs in Georgia for males (purple), females (orange), and both sexes (green).

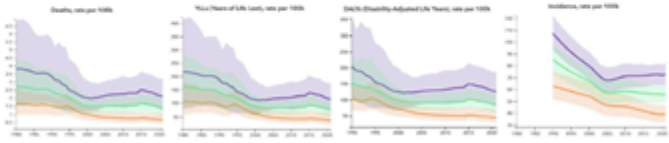


Figure 3. Sex-stratified pedestrian RTI burden in Tajikistan. This figure presents four age-standardized graphs illustrating mortality rate, YLLs, DALYs, and incidence rate for pedestrian RTIs in Georgia for males (purple), females (orange), and both sexes (green).

CONCLUSIONS

Our findings highlight notable sex-specific differences in pedestrian RTIs in Georgia, Syria, and Tajikistan, where males suffer disproportionately higher mortality, YLLs, and incidence rates. The temporal decline in mortality and YLLs in Georgia, despite stable incidence rates post-2015, suggests that enhanced emergency care access and healthcare reform (e.g., the 2013 Universal Healthcare Program) have played pivotal roles in improving health outcomes.

Furthermore, our data shows that HDI did not always translate to improved pedestrian safety. In Georgia, HDI was positively correlated with mortality, YLLs, and incidence—suggesting that urbanization and increased exposure to road environments may outpace infrastructure improvements. In contrast, Syria showed no significant correlations between HDI and RTI outcomes, likely reflecting ongoing infrastructural and socioeconomic instability. Notably, Syria exhibited some narrowing of sex disparities over time, while Georgia showed a subtle widening. These findings underscore that while economic development is vital, tailored interventions—such as sex-specific pedestrian safety campaigns, traffic enforcement, and orthopedic trauma system strengthening—are essential to translate growth into equitable, life-saving public health outcomes.

References

1. CDC. Global Road Safety. Transportation Safety. Published June 7, 2024. Accessed July 9, 2024. https://www.cdc.gov/transportationsafety/global/index.html

2. Global Burden of Disease Collaborative Network. Global Burden of Disease Study 2021 (GBD 2021). Seattle, United States: Institute for Health Metrics and Evaluation (IHME); 2024.

82

Primary parathyroidism from concurrent parathyroid hyperplasia and ectopic parathyroid adenoma

Clarice Szeto[1], June Yao[2], Chantal Riba[2], Chau Nguyen[2]
[1]Western University of Health Sciences, College of Osteopathic Medicine of the Pacific, [2]Community Memorial Health Systems

Biography: *Clarice Szeto (she/her), a San Francisco Bay Area native, is a medical student at the Western University of Health Sciences College of Osteopathic Medicine of the Pacific and is concurrently pursuing a Master of Public Health at Claremont Graduate University. She graduated summa cum laude from the University of Southern California with dual degrees in Cognitive Science and Human Biology. Prior to medical school, she worked as a reproductive health and primary care medical assistant at Planned Parenthood Mar Monte, building a personal and passionate foundation of reproductive justice and patient advocacy. She is currently conducting research on attitudes of health professionals towards homelessness, while providing administrative support to the Society of Family Planning's BIPOC Special Interest Group. Clarice is deeply motivated by health equity and justice for providers and patients in her future career. Beyond medicine, Clarice is an avid baker, amateur chef, and a lifelong dancer.*

Abstract

Background: Primary hyperparathyroidism is most commonly caused by parathyroid adenoma and secondarily by hyperplasia. Bilateral neck exploration with parathyroidectomy remains the standard for primary hyperparathyroidism. However, persistently elevated PTH despite parathyroidectomy suggests an ectopic gland. Within the last 50 years, there have been 101 studies conducted on primary hyperparathyroidism caused by parathyroid adenomas or hyperplasia. In this study, we present a rare case of primary hyperparathyroidism due to coexisting one-gland parathyroid hyperplasia and an ectopic paraesophageal adenoma.

Case presentation: A 72-year-old Caucasian female with a long-standing history of primary hyperparathyroidism managed with cinacalcet presented with recurrent hospital admissions for symptomatic hypercalcemia. She was previously found to have significantly elevated PTH and serum calcium as well as an obstructive calculus of the left kidney. She was treated with cinacalcet, calcitonin, and a nephrostomy tube placement prior to this recurrent admission. Laboratory data revealed a PTH of 700 pg/mL and a corrected serum calcium markedly elevated at 17.3 mg/dL. Diagnostic imaging of CT neck and chest, neck ultrasound, and sestamibi scan did not reveal evidence of thyroid or parathyroid adenoma. PTH remained elevated despite bilateral neck exploration and partial parathyroidectomy for left superior parathyroid hyperplasia. An ectopic paraesophageal parathyroid adenoma was ultimately discovered and resected, resolving the primary hyperparathyroidism.

Conclusion: Our case is the second reported incidence of one-gland parathyroid hyperplasia and an ectopic paraesophageal adenoma. This unique presentation points to certain limitations of first-line diagnostic imaging for primary hyperparathyroidism. A detailed review of diagnostic imaging such as ultrasound or CT in developmentally significant ectopic locations, as well as adequate IOPTH reduction during bilateral cervical exploration, could reduce the need for re-operation. Furthermore, combined use of more sensitive imaging modalities such as 4D-CT or PET radiotracers with first-line imaging could yield improved localization. However, the limited availability of these additional imaging modalities may necessitate bilateral neck exploration with IOPTH for the identification of ectopic adenomas.

Inspiration: With advances in preoperative localization studies, techniques in minimally invasive parathyroidectomy (MIP) have been evolving. In contrast to bilateral neck exploration, it has been shown to have many advantages including less operative time, fewer complications, improved cosmetic results, and greater patient satisfaction. With similar success rates, the adoption of MIP should be highly considered in appropriately selected patients.

Patient-Oriented and Epidemiology Projects

Poster Snapshot

Primary Parathyroidism from Concurrent Parathyroid Hyperplasia and Ectopic Parathyroid Adenoma

Clarice Szeto, June Yao, Chantal Riba, Chau Nguyen
Community Memorial Health System

INTRODUCTION

Primary hyperparathyroidism (PHPT) is characterized by excessive secretion of parathyroid hormone (PTH) and is the most common cause of hypercalcemia. Parathyroid adenoma is the most common cause of PHPT, comprising 80-85% of cases, while parathyroid hyperplasia includes 15-20% of cases (1). Removal of the affected glands is usually curative. Persistent or recurrent primary hyperparathyroidism can be attributed to inadequate resection secondary to an ectopic gland (estimated at up to 5%) or double adenoma, which may be found 8-11% of the time.

Ultrasound and sestamibi scintigraphy remain the the primary localization studies to identify enlarged parathyroid glands. When primary imaging modalities are negative or inconclusive, additional diagnostics including 4D-CT, PET radiotracers, or intraoperative gamma probes may be indicated (4).

Upon review of the literature, there is only one similar case of coexisting parathyroid hyperplasia and ectopic parathyroid adenoma. In this case report, we present a case of primary hyperparathyroidism due to single gland parathyroid hyperplasia and an ectopic paraesophageal adenoma. The patient underwent bilateral neck exploration and curative parathyroidectomy with intraoperative PTH monitoring. This case report has been reported in line with the SCARE Criteria (5).

Figure 2. Gross image of right paraesophageal parathyroid adenoma.

CASE REPORT

A 72-year-old Caucasian female with a long-standing history of primary hyperparathyroidism managed with cinacalcet presented with recurrent hospital admissions for symptomatic hypercalcemia. Medical history includes hypertension, hyperlipidemia, type 2 diabetes, heart failure, bipolar disorder, and uterine cancer. She was hospitalized for progressively worsening encephalopathy with elevated PTH levels of 311 pg/mL and hypercalcemia of 14.5 mg/dL.

Diagnostic imaging of CT neck, neck ultrasound, and sestamibi scan did not reveal evidence of parathyroid adenoma. Diagnostic imaging of CT chest was also negative for mediastinal mass. On a personal review of the CT scan, a right peri-thyroid cystic nodule was found and felt to be the potential adenoma. With her PTH level more than doubled at 700 pg/mL on hospital day 9, the patient was taken for a bilateral neck exploration with excision of a left superior parathyroid hyperplastic nodule. However, her PTH level rose to a similar preoperative value of 758 pg/mL.

Upon surgeon review of CT scan, a right paraesophageal mass was identified at the level of the clavicle, displacing the esophagus to the left (Figure 1). The patient was then taken back for a re-exploration with excision of a right paraesophageal ectopic parathyroid adenoma (Figure 2). Her intraoperative PTH level decreased to 42 dg/mL.

The patient had a slow recovery postoperatively. Her encephalopathy improved but was ongoing due to other comorbidities. PTH remained within normal limits after surgery.

Figure 1 . CT scan showing right paraesophageal mass causing displacement of her esophagus.

DISCUSSION

This case report presents a rare case of coexisting parathyroid hyperplasia and ectopic parathyroid adenoma. Failure of preoperative ultrasound and sestamibi scan to identify both parathyroid adenoma and hyperplasia required further detailed personal review, leading to neck re-exploration. Persistent elevation of PTH after left superior parathyroidectomy led to a second, more detailed review of the CT that showed a right paraesophageal mass, which was resected during re-exploration. Pathology from this resected mass identified right parathyroid adenoma with the resolution of refractory hypercalcemia and primary hyperparathyroidism.

In the last 50 years, there has been only one similar case of coexisting parathyroid hyperplasia and ectopic parathyroid adenoma presented by Xie and Huang. A ^{99m}Tcsestamibi scan had shown left superior parathyroid hyperplasia upon removal. PTH remained elevated 6 months post-excision and was found to have a retrosternal ectopic parathyroid adenoma on repeat sestamibi scan (7).

Primary preoperative imaging to identify and localize parathyroid adenomas includes ultrasound (US) and sestamibi scintigraphy (8). The sensitivity of US imaging when evaluating for solitary adenomas is 72-89%, whereas the sensitivity of sestamibi imaging for solitary adenomas is 68-98% (9). Localization accuracy sensitivity improves to 96% when both studies are performed (10), which reduces the need for bilateral neck exploration. However, the sensitivities decrease when evaluating for multiglandular disease, creating a new diagnostic challenge (11).

Our case differs from the earlier similar case of single-gland parathyroid hyperplasia and an ectopic adenomatous gland in that nuclear medicine imaging, ultrasound, and cross-sectional imaging were all reported to be negative. This unique presentation points to certain limitations of first-line diagnostic imaging for primary hyperparathyroidism. A detailed personal review of first-line diagnostic imaging in developmentally significant ectopic locations, as well as bilateral cervical exploration, may be helpful to reduce the need for re-operation. Intraoperative PTH is also paramount in confirming possible multi-gland disease (12). There remains some controversy as to whether double adenomas may represent a spectrum of parathyroid hyperplasia. In our case, the enlarged left superior gland and the right superior adenoma in an ectopic location were grossly different, with the latter being closer to a typical tumor (Fig. 2) and the former more broad and diffuse in appearance. It is noted that pathologically, it can be difficult to differentiate between the two.

REFERENCES

1. Hendricks-Klyber K, Goldstein MB, Pradhan S, Silberstein JP, Parkhurst SD. Missed 4-Gland Parathyroid Hyperplasia Initially Detected as a Parathyroid Adenoma. JCEM Case Rep. 2024 Jan 5;2(1):luad173. doi: 10.1210/jcemcr/luad173. PMID: 38196552; PMCID: PMC10776874.
2. Rodriguez S, Gaertner P, Narbe R. Ectopic parathyroid glands and their anatomical, clinical and surgical implications. Experimental and clinical endocrinology & diabetes. 2013 Nov;122(10):604-10.
3. Johnson NA, Tublin ME, Ogilvie JB. Parathyroid imaging: technique and role in the preoperative evaluation of primary hyperparathyroidism. AJR Am J Roentgenol. 2007 Nov;189(5):1104-16. doi: 10.2214/AJR.07.2526.
4. Wang TS, Cheung K, Farrokhyar F, Roman SA, Sosa JA. Meta-analysis of ultrasound for localization of abnormal parathyroid glands before first-time neck exploration. Ann Surg Oncol. 2008 Jul;15(7):1966-73. doi: 10.1245/s10434-008-9894-z. Epub 2008 Apr 15. PMID: 18409000.
5. Agha RA, Franchi T, Sohrabi C, Mathew G, for the SCARE Group. The SCARE 2020 Guideline: Updating Consensus Surgical Case Report (SCARE) Guidelines. Int J Surg. 2020 Dec;84:226-230. doi: 10.1016/j.ijsu.2020.08.047. Epub 2020 Sep 16. PMID: 32949799.
6. De Gregorio L, Lubitz CC, Yeats AA Jr, Sippi R Jr, Ramsay S, Almquist M, & Hazzan A. A. (2010). The truth about double adenomas, incidence, localization, and intraoperative parathyroid hormone. Journal of the American College of Surgeons, 210(5), 749–753. https://doi.org/10.1016/j.jamcollsurg.2009.12.031
7. Xie F, Huang J. Hyperparathyroidism caused by coexisting parathyroid hyperplasia and ectopic parathyroid adenomas. Clinical Nuclear Medicine. 2014 Feb 1;39(2):156-7.
8. Procopio G, Bellomo C, Gandolfi G, Sisto A, Olondo D, Matteucci F. Primary hyperparathyroidism: imaging to pathology. J Clin Imaging Sci. 2012;2:66. doi: 10.4103/2156-7514.103552. Epub 2012 Oct 5. PMID: 23162801; PMCID: PMC3491240.
9. Song JY. Parathyroid ultrasonography: the evolving role of the radiologist. Ultrasonography. 2015;34(4):268-274. doi: 10.14366/usg.14071. Epub 2015 Jun 30. PMID: 26165139; PMCID: PMC4596124.
10. De Pas, M. C., Colagrande, S., Biagini, C., Tonacchi, A., Rita, G., Viggiani, L., ... & Brandi, M. L. (2005). Parathyroid glands: combination of MIBI-SPET scintigraphy and US for demonstration of parathyroid adenoma and nodules. Radiology, 237(2), 463-470.
11. Nasser-Soula M, Kaguelidi-Jaeger K, Weiller J. Preoperative identification of Ectopic Retroesophageal Parathyroid Adenoma using 4D Computed Tomography Scan. ACS Assessed December 14. 2004.
12. https://www.hsc.wvu.edu/medical-professionals/news-publications/physician-bulletin/volume-2/2012/state-of-the-art-in-the-surgical-treatment-of-primary-hyperparathyroidism-and-double-adenomas. Kim Hyeongrae Head Neck Surg. 2009;136(12):1206-1208. doi:10.1001/archoto.2009.192

83

Provider perspectives on addressing stigma and biases in chronic pain management for individuals with HIV and substance use disorder

Isabella Iregui[1], Sonya Bhatia, Dr. Amy Knowlton, Dr. Tuo-Yen Tseng
[1]Johns Hopkins University

Biography: *Isabella Iregui (she/her/hers) is a second-year pre-medical undergraduate student at Johns Hopkins University double-majoring in Public Health and Natural Sciences.*

Abstract

Background: Chronic pain management in individuals with HIV and a history of substance use disorder (SUD), conditions that disproportionately affect Black individuals, can be complicated by clinicians' biases. Unconscious or conscious, these biases shape clinical decision-making, patient-provider relationships, and treatment outcomes. This research explores providers' perspectives on identifying and addressing these biases in chronic pain management for patients with HIV and SUD.

Methods: Between January 2019 and July 2020, we interviewed 14 physicians and nurse practitioners involved in outpatient healthcare for HIV and chronic pain problems in Baltimore, Maryland. The interview transcripts were coded and analyzed using Dedoose software to identify major themes related to chronic pain, substance use, stigma, and patient-provider interactions.

Results: Providers acknowledged the prevalence of clinical biases reflected in clinicians' use of stigmatizing language in reference to HIV patients with substance use histories, and the frequent assumption that patients are misusing or diverting drugs. One describes, "We now call them malingering people, and we talk about how manipulative they are… We're horrible to them as a medical community." Building rapport and mutual understanding in patient-provider relationships is considered a critical component of quality, effective healthcare, and essential for identifying and overcoming provider biases. One clinician stated, "there are people that are really seeking drugs, but it's important to first control the pain…You have to get to know them... That gives you an idea of who is really drug seeking and who's not."

Conclusion: Providers reported witnessing biases in chronic pain management for individuals with HIV and SUD, highlighting ways they perpetuate social stigma and their impact on care relationships, quality, and pain treatment. These findings emphasize the importance of fostering trust and mutual understanding in patient-provider relationships to mitigate the impact of stigma and bias in pain management and prevent potential drug misuse and diversion.

Inspiration: This research was driven by a commitment to addressing healthcare disparities, particularly for individuals who experience the compounded stigma of race, HIV, substance use disorder, and chronic pain. Biases surrounding these conditions can shape patient-provider interactions and influence the overall quality of care. Through centering provider perspectives, our study provides a crucial lens into systemic inequities and barriers to effective pain management. These insights are critical for designing targeted interventions to strengthen patient-provider relationships, with the goal of preventing drug misuse and diversion, reducing harmful clinical biases, and promoting healthcare equity for all individuals.

Patient-Oriented and Epidemiology Projects

85

Social Determinants of Health and Biologics for Children with Severe Persistent Asthma: A Retrospective Review

Gia-Binh Nguyen[1], Dr. Tanvi Patel[1,2], Dr. Adalberto Torres[1,2]
[1]University of Central Florida College of Medicine, [2]Nemours Children's Hospital

Biography: *Gia-Binh "Bianca" Nguyen is a second-year medical student at the University of Central Florida College of Medicine. She is interested in immunology and is still undecided regarding whether she wants to care for children, adults, or both as a future physician. Outside of medicine, she enjoys spending quality time with her loved ones (including her mischievous cat), being a Disney adult, playing games, and reading books. She is currently reading The Spirit Catches You and You Fall Down by Anne Fadiman.*

Abstract

Background: Asthma remains a prevalent chronic disease globally. Biologics are approved for patients with severe and persistent asthma; however, research on differential access to biologics between groups of pediatric patients is lacking. We sought to examine whether social determinants of health (SDOH) differed between pediatric patients with severe persistent asthma who received biologics and those who did not.

Methods: This was an IRB-exempt chart review of patients with severe persistent asthma at a large children's hospital in central Florida. The cohorts either were prescribed biologics (omalizumab, dupilumab, tezepelumab-ekko, mepolizumab) for asthma between 01/01/2022-12/31/2023 (n=147), or were never prescribed biologics for asthma (n=163). We included patients with the ICD-10 code for severe persistent asthma (J45.50) from 01/01/2022-12/31/2023. We excluded patients >18 years of age before 01/01/2022, patients <1 year of age before 01/01/2022, and patients who were not administered biologic therapy despite having been prescribed a biologic. The SDOH variables we compared between the cohorts were race (White, Black, Other, or Information Not Available), ethnicity (Hispanic/Latino, Non-Hispanic/Latino, or Information Not Available), and insurance status (Public, Private, Other, Multiple Types, or Information Not Available). The Chi-Square test was used for analyses with significance determined at $p<0.05$. "Information Not Available" observations were excluded from the analysis of their respective variables.

Results: Race, ethnicity, and insurance status were not associated with prescription and administration of biologics for pediatric patients with severe persistent asthma (n=304 and p=0.520, n=306 and p=0.137, n=309 and p=0.687, respectively).

Conclusion: Our results showed that pediatric patients with severe persistent asthma who received biologics and those who did not were similar regarding the SDOH of race, ethnicity, and insurance status. However, a limitation is that our data was sourced from one hospital. Therefore, our results are not generalizable to the entire target population of pediatric patients with severe persistent asthma.

Inspiration: I was inspired to pursue a medical education because I wanted to advocate for vulnerable populations. Conducting research in pediatrics as a medical student is one means of working toward this goal. Research in SDOH is especially important because it may reveal systemic inequities in healthcare delivery and increase awareness of the need to address such issues. Finally, the topic of asthma is personally meaningful to me as lack of access to education on risk factors of the disease affected my own family. I am thankful to my research mentors for providing me the opportunity to work on this project.

Patient-Oriented and Epidemiology Projects

Poster Snapshot

College of Medicine
UNIVERSITY OF CENTRAL FLORIDA

Social Determinants of Health and Biologics for Children with Severe Persistent Asthma: A Retrospective Review

Gia-Binh Nguyen, B.A.[1], Tanvi Patel, M.D.[1,2], Adalberto Torres, M.D.[1,2]
[1]University of Central Florida College of Medicine, Orlando, Florida; [2]Nemours Children's Hospital, Orlando, Florida

NEMOURS CHILDREN'S HEALTH

Background

- Asthma continues to be a prevalent chronic disease globally. One type of asthma is associated with airway inflammation that results from the recruitment and activation of eosinophils, basophils, and mast cells by the Type 2 helper- (Th2-) cell cytokine profile.
- Recently, monoclonal antibodies that target the Th2-cytokine profile have been approved as biologic therapy for patients with severe and persistent asthma; however, research on differential access to biologic therapy between groups of pediatric patients is lacking.

Objective

- We sought to examine whether social determinants of health (SDOH) differed between pediatric patients with severe persistent asthma who received biologic therapy for asthma and those who were never prescribed biologic therapy for asthma. We examined race, ethnicity, and insurance status.
- Investigating SDOH may reveal systemic inequities in healthcare delivery and increase awareness of the need to address such issues.

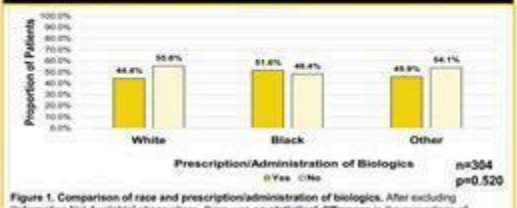
Methods

- Retrospective chart review of **310 patients** with severe persistent asthma at a large children's hospital in Florida.
- Two cohorts: one consisted of patients who were prescribed biologics (omalizumab, dupilumab, tezepelumab-ekko, mepolizumab) for asthma between 01/01/2022-12/31/2023 (**n=147**) and one consisted of patients who were never prescribed biologics for asthma (**n=163**).
- Inclusion criteria: ICD-10 code for severe persistent asthma (J45.50) from 01/01/2022-12/31/2023.
- Exclusion criteria: Patients >18 years of age before 01/01/2022, patients <1 year of age before 01/01/2022, patients who did not receive biologic therapy despite prescription.
- Data were collected and stored in REDCap, a protected online application.
- **Chi-square test** used for analysis in SPSS Statistics, **significance at p<0.05**.

Table 1. Descriptive statistics of study population

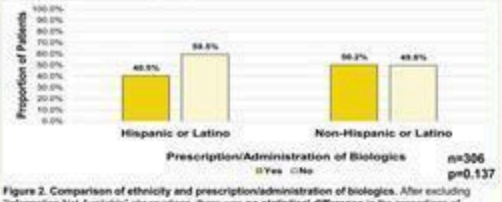
Age on 01/01/2022 (years)	Median (range)	11.1 (1.0-17.7)
Sex	Male	179 (57.7%)
	Female	131 (42.3%)
Race	White	108 (34.8%)
	Black	122 (39.4%)
	Other	74 (23.9%)
	Information Not Available	6 (1.9%)
Ethnicity	Hispanic or Latino	79 (25.5%)
	Non-Hispanic or Latino	227 (73.2%)
	Information Not Available	4 (1.3%)
Insurance Status	Public	217 (70.0%)
	Private	46 (14.8%)
	Other	19 (6.1%)
	Multiple Types	27 (8.7%)
	Information Not Available	1 (0.3%)

Results



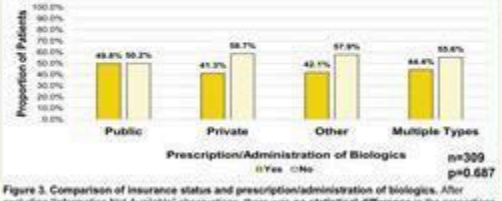
n=304
p=0.520

Figure 1. Comparison of race and prescription/administration of biologics. After excluding "Information Not Available" observations, there was **no statistical difference** in the proportions of patients who received biologic therapy and those who were never prescribed biologic therapy among patients who identified as White, Black, or Other.



n=306
p=0.137

Figure 2. Comparison of ethnicity and prescription/administration of biologics. After excluding "Information Not Available" observations, there was **no statistical difference** in the proportions of patients who received biologic therapy and those who were never prescribed biologic therapy among patients who identified as Hispanic/Latino or Non-Hispanic/Latino.



n=309
p=0.687

Figure 3. Comparison of insurance status and prescription/administration of biologics. After excluding "Information Not Available" observations, there was **no statistical difference** in the proportions of patients who received biologic therapy and those who were never prescribed biologic therapy among patients with Public, Private, Other, or Multiple Types of insurance. Government-sponsored plans for children (e.g., Medicaid) were categorized as Public insurance. Plans listed as "Other" in the EMR, Humana Military plans, and no insurance coverage were categorized as Other insurance.

Conclusions and Discussion

- ***Race, ethnicity, and insurance status were not associated with prescription and administration of biologics for pediatric patients with severe persistent asthma.***
- Pediatric patients with severe persistent asthma who received biologic therapy for asthma and those who were never prescribed biologic therapy for asthma were similar regarding the SDOH of race, ethnicity, and insurance status.
- Results did not suggest bias in prescription and administration of biologics in this diverse study population based on race, ethnicity, and insurance status.

Limitations

- Data from only one hospital, not generalizable to entire target population.
- Information may have been missing from the EMR. For instance, a prescription of biologic therapy for a patient before they initiated care at the hospital may have been undocumented. This patient would have been erroneously included in the control cohort.

Next Steps

- Similar studies can be done at other hospitals and medical institutions to increase generalizability.
- Other variables (e.g., access to specialists, secondary diagnoses) can be examined for association with prescription and administration of biologics.
- A small number of patients who were prescribed biologics but were not administered biologic therapy were excluded from this study—reasons for lack of administration of therapy can be explored.

86

The Impact of Hidradenitis Suppurativa on Sexual Health in Women Compared to Men: A Systematic Review

Elissa Cleland[1], Alim Osman[1], Alexandra Nigro[1], Michael Povelaitis[2], Dr. Marc Z. Handler[3,4]
[1]Eastern Virginia Medical School, [2]Hackensack Meridian School of Medicine, [3]New York Medical College, [4]Rutgers School of Medicine

Biography: *Elissa Cleland is a rising fourth year medical student at Eastern Virginia Medical School in Norfolk, VA. She graduated with a BS in Biology from the College of William & Mary and is an aspiring OB/GYN. She is extremely passionate about women's health and chronic conditions that affect people with uteruses and vulvas. She dedicates her advocacy efforts to combating systemic inequities and reproductive injustices.*

Abstract

Background: Hidradenitis suppurativa (HS) is a chronic inflammatory condition affecting apocrine glands in skin. It is characterized by abscesses and sinus tracts and is associated with a lower overall quality of life. Women are much more likely to develop HS compared to men so the aim of our study was to evaluate the impact of HS on sexual health based on gender.

Methods: We conducted a systematic review of literature in accordance with the Preferred Reporting Items for Systematic-Reviews and Meta-Analyses (PRISMA). We searched for all studies looking at aspects of sexual health in patients diagnosed with HS. Studies only focusing on male sexual health were excluded. Two reviewers independently collected data on each study. Any discrepancy in data collection was resolved by a third co-investigator. Each study underwent quality analysis using the Methodological Index for Nonrandomized Studies (MINORS) scale.

Results: The review included data from nine studies with a total of 26,181 participants. Of these, 10,800 were women and 15,381 were men. Some studies focused exclusively on female participants, while others had mixed cohorts. Sexual dysfunction was more prevalent and severe in females compared to males when measured with various scales of sexual dysfunction. Female patients with HS reported greater sexual distress, reduced sexual function, and a significantly lower quality of life compared to their male counterparts. The Female Sexual Function Index (FSFI) consistently revealed high rates of dysfunction, particularly among women over 40 years old and those with anogenital lesions. Sexual distress in females with HS was linked with higher levels of pain, active lesions, and disease severity. However, sexual dysfunction in males was less strongly associated with decreased quality of life measures. Male partners of female HS patients exhibited sexual dysfunction, emphasizing the impact of the disease on sexual relationships.

Conclusions: Overall, females with HS were more affected by sexual dysfunction than males, especially in the context of active disease and anogenital involvement. Age, disease duration, and comorbid conditions further exacerbated sexual health outcomes, particularly in women. Our findings reveal that HS can further lower quality of life in women, and it may be beneficial for women' s health providers to screen HS patients for poor sexual health.

Inspiration: In recent years, many studies have been published analyzing different aspects of sexual health in patients with HS. To date, no systematic review has examined the combined findings of these studies and how they impact women compared to men.

Patient-Oriented and Epidemiology Projects

87

The Impact of Obesity on Orthopedic Injuries and Fracture Patterns in Motor Vehicle Accidents

Philip Zitser
[1]New York Institute of Technology, Manhattan, [2]New York Medical College, [3]Richmond University Medical Center, [4]University of Tampa

Biography: *Philip Zitser is a third-year BS/DO student at the New York Institute of Technology, set to matriculate into medical school in Fall 2025. He serves as a scribe and translator for Russian- and Spanish-speaking patients in a neurology office. He also tutors students in the Chemistry and Physics Section of the MCAT for Premedley LLC, having scored in the 96th percentile. Additionally, scoring in the 4th quartile (top) on CASPer, he provides mentorship to students navigating their medical journeys. As president of his undergraduate chapter of the American Medical Student Association (AMSA), Philip revitalized medical leadership and advocacy initiatives, organizing the largest fall academic event for two consecutive years: Debate For Change. This event bridges medical education, policy debate, and healthcare advocacy, fostering discussions on critical healthcare issues. Philip has also contributed to the study, "Adverse Events from Lacrimal Gland Botulinum Toxin Injection: Twelve-Year Experience in 148 Patients," presented at the 2023 American Society of Ophthalmic Plastic and Reconstructive Surgery Symposium. He has also authored multiple publications, including "Healthcare Accessibility in New York City" and "An In-Depth Analysis of the Effects of Various Public Service Facilities on Corona, Queens," focusing on improving long-term access to care for local communities. Philip remains dedicated to medical education, advocacy, and research to find new and lasting impacts on local communities and patients.*

Abstract

Background: Obese individuals face higher mortality rates, longer ICU stays, and increased complications following blunt trauma. However, the impact of obesity in motor vehicle accidents (MVAs) remains unclear. Some research suggests a “cushioning effect” where excess adipose tissue may provide a protective barrier, potentially reducing the severity of abdominal injury; however, others found no protective effect and instead reported an increased risk of injury in obese individuals. Additionally, there is limited data on how obesity influences orthopedic injuries in MVAs. This study aims to assess the relationship between obesity and orthopedic trauma severity in MVA patients. With obesity rates projected to exceed 50% by 2030, understanding its impact is important for improving vehicle safety, preventing injury, and optimizing patient outcomes.

Methods: Retrospective analysis of 555 patients presenting to a Level 1 Trauma Center following an MVA from 2010-2022. Patients were stratified based on Body Mass Index (BMI): obese (BMI ≥30 kg/m²) and non-obese (BMI <30 kg/m²). Primary outcomes included fracture incidence and injury severity. Collected data included demographics, BMI, injury severity by body region, ICU/hospital length of stay, and in-hospital mortality. Adjustments were made for potential confounders, including age, gender, restraint use, and airbag deployment.

Results: Among 555 patients, 178 (32.6%) were obese. The mean number of fractures (0.62 vs. 0.46, p=0.096) was similar between the obese and non-obese. However, obese patients had a significantly higher risk for upper extremity(7.3% vs. 3.4%, p=0.045) and lower extremity fracture (7.3% vs. 2.7%, p =0.01), specifically of the tibia/fibula (5.6% vs. 1.6%, p=0.008). No significant differences were found in the head, thoracolumbar, or pelvic fracture. After controlling for age, gender, restraint use, and airbag deployment, obesity remained an independent predictor of lower extremity fracture (aOR) 2.62 (95% CI: 1.01– 6.56).

Conclusion: Obesity independently predicts a higher risk of lower extremity fractures following MVA.

Inspiration: This study was created to help bridge the knowledge gap and provide clinicians with an understanding of the outcomes of obesity on fracture patterns and injury severity for MVA patients. As MVAs are a leading cause of mortality and morbidity, uncovering these associations can help alter medical care. Improving triage protocols and patient outcomes by identifying obesity as a risk factor will inform healthcare providers and automotive safety engineers to minimize injury severity and maximize safety in this high-risk population. Understanding how obesity affects MVA injuries will provide emergency responders with tools and better clinical interventions for at-risk populations.

Patient-Oriented and Epidemiology Projects

Poster Snapshot

Richmond University Medical Center

The Impact of Obesity on Orthopedic Injuries and Fracture Patterns in Motor Vehicle Accidents at Level 1 Trauma Center

Philip Zitser[1], Alina Shats[2], Jonathan Japa BS[3], Nisha Lakhi MD[4,5]

1. New York Institute of Technology, New York, New York, United States 2. The University of Tampa, Tampa, Florida, United States 3. New York Medical College, School of Medicine, Valhalla, NY, United States 4. New York Medical College, School of Medicine, Department of Obstetrics and Gynecology, Valhalla, NY, United States 5. Richmond University Medical Center, Department of Trauma Surgery, Staten Island, NY, United States

NEW YORK INSTITUTE OF TECHNOLOGY

BACKGROUND

Obesity in the United States affects nearly 40% of U.S. adults and is linked to increased risks in trauma, heart disease, and diabetes. Previous studies suggest obese trauma patients have higher mortality, ICU stays, and complications, particularly in orthopedic surgery. However, conflicting research proposes a "cushion effect," where visceral fat may reduce injury severity.

While MVA risk factors like age, gender, and seat belt use are well-documented, obesity's role remains unclear. Some meta-analyses link higher BMI to increased injury severity and mortality, while others suggest protective effects in head injuries.

With obesity projected to affect 50% of adults by 2030, The objective of the study was to compare fracture occurrence, injury severity, and clinical outcomes at a Level 1 Trauma Center in obese and nonobese patients following a MVA. Understanding these associations can guide vehicle safety design and healthcare strategies to improve patient outcomes.

Kinematics of a nonobese (left) and an obese (right) subject. Note the significantly greater forward pelvic excursion for the obese subject, the resulting decreased forward pitch of the obese torso, and the consequent difference in head trajectory.

Kent, Richard W., Jason L. Forman, and Ola Bostrom. "Is There Really a 'Cushion Effect'? A Biomechanical Investigation of Crash Injury Mechanisms in the Obese." Obesity 18, no. 4 (September 6, 2012): 749–53.

METHODS

This retrospective study was approved by the Institutional Review Board of New York College School of Medicine and conducted at Richmond University Medical Center (RUMC), a Level 1 Trauma Center located in Staten Island, NY, using data collected from the electronic medical records (EMR) of patients who presented to the trauma center between 01 January 2010 and 31 December 2022. 555 Patients were stratified based on Body Mass Index (BMI): obese (BMI ≥30 kg/m²) and non-obese (BMI <30 kg/m²). Primary outcomes included fracture incidence and injury severity. Collected data included demographics, BMI, injury severity by body region, ICU/hospital length of stay, and in-hospital mortality. Adjustments were made for potential confounders, including age, gender, restraint use, and airbag deployment.

Data points analyzed patient demographics (age, race, ethnicity sex), BMI, Injury Severity Score (ISS), body region of injury(s), Abbreviated Injury Scale (AIS) per body region, intensive Care Unit (ICU) length of stay, length of hospital stay, and discharge status. Fractures were classified into 5 regions of the human body, and each region included bones that anatomically corresponded to that region: Head (cranium, facial bones), Upper extremities (humorous, radius/ulna, hand), Thoracolumbar (ribs/sternum/clavicle/scapula, spine), Pelvis (hip bone, sacrum/coccyx), and Lower extremities (femur/patella, tibia/fibula, foot)

DEMOGRAPHICS

Characteristic	BMI ≥ 30 (n= 178)	BMI <30 (n= 377)	p-value
Age, mean (STD)	45.2 (16.0)	44.2 (20.2)	0.552
Sex, n (%)			0.641
Male	103 (57.9%)	226 (59.9%)	-
Female	75 (42.1%)	151 (40.1%)	-
BMI, mean (STD)	34.3 (4.7)	24.6 (3.0)	<.001*

RESULTS

Among 555 patients, 178 (32.6%) were obese. The mean number of fractures (0.62 vs. 0.46, p=0.096) was similar between the obese and non-obese. However, obese patients had a significantly higher risk for upper extremity(7.3% vs. 3.4%, p=0.045) and lower extremity fracture (7.3% vs. 2.7%, p =0.01), specifically of the tibia/fibula (5.6% vs. 1.6%, p=0.008). No significant differences were found in the head, thoracolumbar, or pelvic fracture. After controlling for age, gender, restraint use, and airbag deployment, obesity remained an independent predictor of lower extremity fracture (aOR) 2.62 (95% CI: 1.01– 6.56).

For upper extremity fracture, our model (χ^2 (5, N=555) =25.96, p<0.001) outperformed the null model. Although obesity increased likelihood of upper extremity fracture, it fell short of statistical significance, (aOR 2.33 (95% CI: 0.97 – 5.59, p = 0.058) indicating that other predictor variables (gender, age, restrain use, and airbag deployment) may also influence occurrence of upper extremity fractures.

LEVEL 1 TRAUMA DATA

	BMI ≥30 (n= 178)	BMI <30 (n = 377)	p-value	OR	95% CI
ISS					
ISS, Mean (SD)	4.6 (7.5)	4.5 (7.2)	0.703	-	-
ISS ≥15, n (%)	11 (6.2%)	21 (5.6%)	0.774	1.12	0.52 – 2.37
AIS Score ≥ 3, n (%)				-	-
Head	3 (4.2%)	19 (10.9%)	0.093	0.36	0.10 – 1.25
Face	2 (7.4%)	1 (0.8%)	0.087	9.52	0.83 – 109.10
Neck	0	0		-	-
Thorax	12 (46.2%)	14 (24.1%)	**0.044***	2.69	1.01 - 7.16
Spine	3 (13.0%)	10 (25.0%)	0.259	0.45	0.11 – 1.84
Upper Extremity	1 (2.3%)	1 (1.3%)	0.66	1.86	0.11 – 30.45
Lower Extremity	6 (13.0%)	5 (6.5%)	0.218	2.16	0.62 – 7.53
External	0	0		-	-
Fractures					
Mean Number of Fractures, mean (SD)	0.6 (1.2)	0.5 (1.0)	0.096	-	-
Number of Open Fractures, n (%)	4 (2.2%)	3 (0.8%)	0.153	2.87	0.64 – 12.94
Fracture Incidence by Anatomical Region					
Head, n (%)	11 (6.2%)	24 (6.4%)	0.933	0.97	0.46 – 2.02
Cranium	2 (1.1%)	7 (1.9%)	0.521	0.60	0.12 – 2.91
Facial Bones	11 (6.2%)	20 (5.3%)	0.675	1.18	0.55 – 2.51
Upper Extremity, n (%)	13 (7.3%)	13 (3.4%)	**0.045***	2.21	1.01 - 4.86
Humerus	3 (1.7%)	2 (0.5%)	0.179	3.21	0.53 – 19.41
Radius/Ulna	6 (3.4%)	7 (1.9%)	0.271	1.84	0.61 – 5.57
Hand	3 (1.7%)	4 (1.1%)	0.538	1.60	0.35 – 7.22
Thoracolumbar, n (%)	27 (15.2%)	58 (15.4%)	0.947	0.98	0.60 – 1.62
Ribs, Sternum, Clavicle, Scapula	17 (9.6%)	38 (10.1%)	0.846	0.94	0.52 – 1.72
Spine	14 (7.9%)	30 (8%)	0.97	0.99	0.51 – 1.91
Pelvis, n (%)	3 (1.7%)	4 (1.1%)	0.538	1.60	0.35 – 7.22
Hip	3 (1.7%)	4 (1.1%)	0.538	1.60	0.35 – 7.22
Sacrum/Coccyx	0	1 (0.3%)	0.495	1.00	0.99 – 1.00
Lower Extremity, n (%)	13 (7.3%)	10 (2.7%)	**0.01***	2.89	1.24 - 6.73
Femur/Patella	4 (2.2%)	4 (1.1%)	0.274	2.14	0.53 – 8.67
Tibia/Fibula	10 (5.6%)	6 (1.6%)	**0.008***	3.68	1.32 - 10.29
Foot	3 (1.7%)	1 (0.3%)	0.065	6.45	0.67 – 62.41

CONCLUSIONS

This study analyzed the connection between obesity, fracture patterns, and injury severity in MVAs. On univariate analysis, we discovered that obese patients experienced a higher incidence of upper and lower extremity fractures, particularly of the tibia and fibula, compared to non-obese patients. After adjusting for gender, age, restraint use, and airbag deployment, obesity was identified as an independent predictor of lower extremity fractures.

Additionally, we noted a greater incidence of severe thoracic injury (AIS≥3) in obese patients. Our findings align with prior studies and contribute to the ongoing discussion about obesity and MVAs.

88

The Relationship Between Verbal and Non-Verbal Imitative Learning, Gesture Production, and Social Communication in Children with Autism Spectrum Disorders.

Karen Linares[1]
[1]Johns Hopkins University

Biography: *Karen Linares Mendoza is a Junior at the Krieger School of Arts and Sciences studying Cognitive Science with a focus on Cognitive Psychology/Neuropsychology and Linguistics. As a first-year immigrant from Mexico and native Spanish speaker, Karen has worked as a Spanish Interpreter in the Johns Hopkins Outpatient Clinic for two years serving the Hopkins Community Connection program. Her experiences interpreting expand all the way from personal family experiences to the Pediatric Emergency Department at Hopkins. Karen has always had a passion for language, speech, and culture. This has led her to pursue research for over 4 years now in the cognitive sciences with a language development and social communication focus. In Baltimore, Karen is currently working on her own independent project at the Kennedy Krieger Institute to look at the communication gaps with populations that suffer from neurodevelopmental challenges affecting imitation and language.As an aspiring physician, Karen is ultimately interested in combining and sharing her diverse experiences with language and community, and its effects within the healthcare field.*

Abstract

Background: Autism Spectrum Disorders (ASD) is a neurodevelopmental condition characterized by social communication (SC) impairments.1 Recent evidence has revealed a potential relationship between motor development, imitative learning, and SC, supported by observations of impaired gesture production and imitation in individuals with ASD.2,3. Thus, this study aimed to investigate the relationship between complex gesture, imitative learning, and SC impairments present in children with ASD.

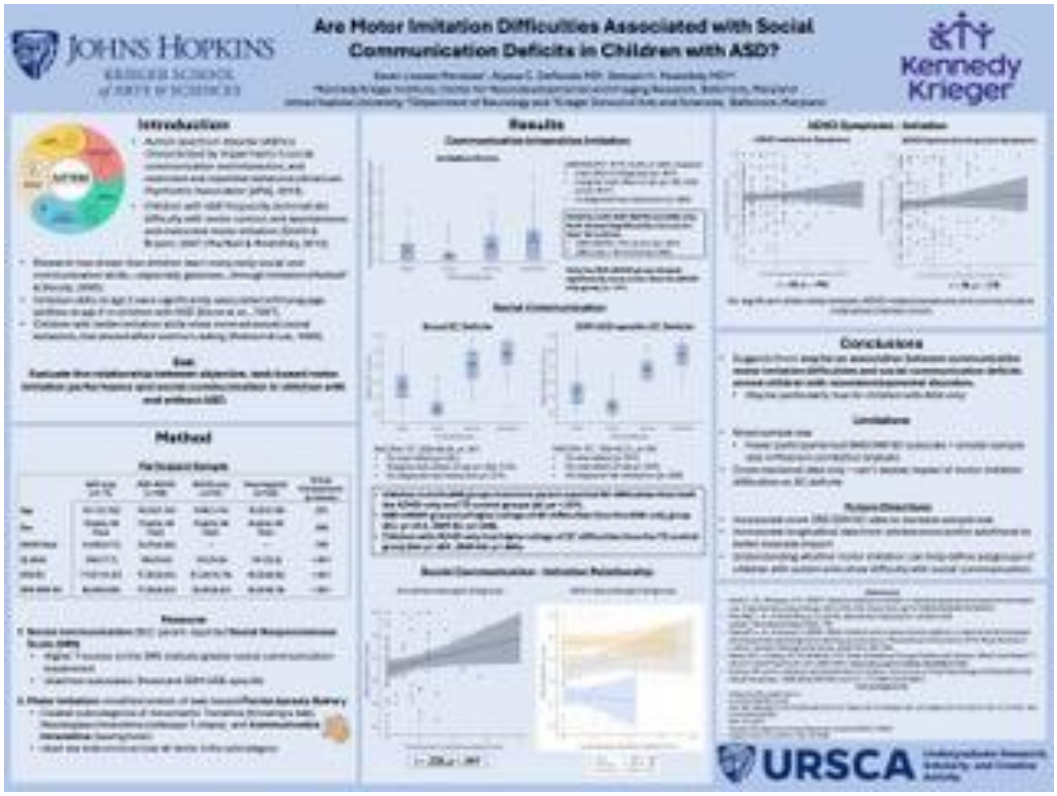
Methods: Participants included 8–12-year-old English-speaking children diagnosed with either comorbid ASD-ADHD (n=75), ASD-only (n=81), or ADHD-only (n=69), and typically developing (TD; n=139). Participants completed a version of the Florida Apraxia Battery, modified for children (PRAXIS), which assesses accuracy of transitive (involving a tool), intransitive-meaningful (communicative/no tool), and intransitive-meaningless gestures under different 3 different conditions (to-command, to-imitation, with-tool use). SC was assessed using the parent-reported Social Responsiveness Scale (SRS).

Results: Four-group, between-subjects ANOVAs revealed a consistent pattern across PRAXIS conditions and movement types, with post-hocs revealing that children with ASD, both those with ASD+ADHD and with ASD-only, showed significantly worse PRAXIS (more movement errors) compared to both ADHD-only (ps<.001-.037) and TD children (ps<.001), with moderate-to-large effect sizes (ds=.59-1.66). Further, post-hoc comparisons of ASD groups revealed that children with ASD+ADHD showed significantly worse PRAXIS compared to ASD-only (ps<.001) with marginal effect sizes (ds=.19-.61). Pearson's correlations including all participants revealed significant correlations of PRAXIS performance with SRS Total t-score (higher scores=more social impairment) and PRAXIS total errors (r=.361, p<.001).

Conclusion: These findings emphasize that children with ASD, regardless of the presence of comorbid ADHD, show significantly impaired praxis compared to TD children as well as those with ADHD-only. However, results suggest that among children with ASD, the presence of comorbid ADHD confers additional praxis impairment. Across all children, impaired praxis was related to higher parent ratings of SC impairment, proposing a clear association between praxis and SC development.

Inspiration: As a native Spanish speaker, I've become mesmerized to understand the cognitive neuroscience of speech and new language development. Last year when I took American Sign Language, I discovered the incredible importance of imitation that all language speakers rely on daily, which furthered my interest in understanding how effective social communication develops. As an aspiring physician, I am passionate about bridging communication gaps with populations that suffer from neurodevelopmental challenges affecting imitation and language. Autistic populations which particularly struggle with communication absolutely require more research in this area, and I want to help drive the potential to improve interventions today.***Patient-Oriented and Epidemiology Projects***

Poster Snapshot



89

The Use of Brain PET Scans Pre- and Post- Anaerobic Exercise as a Diagnostic or Exploratory Tool for Glycogen Storage Disease Type 1: A Theoretical Study

Ava Vanaman[1]
[1]Appalachian State University

Biography: *Ava Vanaman is currently an undergraduate pre-med student at Appalachian State University majoring in Children's and Family Health with minors in chemistry, psychology, and child development. Additionally, Ava serves as president of the Beta chapter of Phi Chi Pre-Medical and Pre-Dental Honors Society. Her research interests include metabolic genetics and inborn errors of metabolism, as well as pediatric medicine. The majority of Ava's clinical involvement has been focused on delivering affordable or free healthcare to rural communities. After medical school, Ava hopes to specialize in metabolic genetics, serving children and families affected by inborn errors of metabolism.*

Abstract

Background: Glycogen Storage Diseases (GSDs) are rare, autosomal recessive metabolic disorders that hinder the body's ability to properly store and use glycogen. Symptoms of GSDs typically include hypoglycemia, hepatomegaly, and muscle weakness. Additionally, exercise intolerance is a major challenge in affected individuals due to the inability to effectively break down or utilize glycogen during periods of metabolic demand. Despite significant health challenges posed by GSDs, research on their type-specific pathology, diagnostic methods, and multi-organ effects remains minimal. This study aims to propose brain positron emission tomography (PET) scans, taken pre- and post-anaerobic exercise, as a potential diagnostic or exploratory tool to examine the effects of GSDs on the brain, focusing on cerebral glycogen accumulation and glucose uptake.

Method: A hypothetical experiment is outlined involving 30 healthy individuals and 30 with GSD type 1. Participants will undergo a 30-minute anaerobic workout consisting of one-minute sprinting intervals and four-minute weight-lifting intervals. Brain PET scans, using the radiotracer N-(methyl-(2-fluoroethyl)-1H-triazole-4-yl)glucosamine (18F-NFTG), will be performed one week prior and during the study, post-exercise. This radiotracer detects glycogen accumulation and has been used previously. Brain regions such as the prefrontal cortex and hypothalamus will be analyzed for changes in glycogen stores and glucose utilization.

Results: It is hypothesized that individuals with GSD type 1 will show increased cerebral glycogen accumulation post-exercise and a decrease in glucose uptake in regions with high glucose demand. Healthy individuals are expected to show no glycogen accumulation and stable glucose uptake.

Conclusion: Successful results from this study could provide a novel and non-invasive diagnostic and/or exploratory approach for GSDs by highlighting the cerebral metabolic response to anaerobic exercise. PET scans may offer a more accurate visualization of glycogen accumulation versus liver scans due to the brain's lower Background uptake and more advanced imaging techniques.

Inspiration: As someone who has navigated the diagnostic odyssey of inborn errors of metabolism, I believe that there are a plethora of diagnostic techniques, especially for glycogen storage disease, that have yet to be investigated. I also recognize that due to their complexity and rarity, there still remains a widespread lack of understanding of these diseases and their pathology. While some diagnostic techniques are certainly more useful and refined than others, simply proposing new ideas for diagnostic testing and exploratory procedures creates new avenues of inquiry for and sparks heightened awareness of these rare, life-altering diseases.

Patient-Oriented and Epidemiology Projects

Poster Snapshot

The use of brain PET scans pre- and post- anaerobic exercise as a diagnostic or exploratory tool for Glycogen Storage Disease type 1: A theoretical study

Ava Vanaman
Appalachian State University, Boone, NC

Abstract

Glycogen Storage Diseases (GSDs) are rare inborn errors of metabolism that hinder glycogen storage and utilization. Despite the challenges GSDs pose, research on their pathology, diagnostic techniques, and multi-organ effects is limited.

This study proposes using brain positron emission tomography (PET) scans pre- and post- anaerobic exercise to assess cerebral glycogen accumulation and glucose uptake in individuals with GSD type 1.

Healthy individuals and those with GSD type 1 will undergo a 30-minute anaerobic workout. PET scans with the radiotracer N-(methyl-(2-fluoroethyl)-1H-triazole-4-yl)glucosamine (18F-NFTC) to detect glycogen accumulation and glucose uptake in the brain.

It is hypothesized that individuals with GSD will show increased glycogen accumulation and decreased glucose uptake, while healthy individuals will show stable glucose uptake.

This method could offer new insights into the neurologic effects of GSDs, as well as serve as a potential diagnostic tool.

Introduction

Glycogen Storage Diseases (GSDs) are a group of rare, autosomal recessive inborn errors of metabolism that impair the body's ability to store and utilize glycogen. Symptoms of GSDS commonly include hypoglycemia, hepatomegaly, and muscle weakness. Additionally, exercise intolerance poses a major challenge for individuals with GSD, as they cannot efficiently break down glycogen during increased metabolic demand. While the inability to effectively utilize glycogen presents significant health challenges for affected individuals, minimal research exists on GSDS and their type-specific pathology, diagnostic techniques, and multi-organ-system effects..

This study aims to propose brain positron emission tomography (PET) scans, taken pre- and post-anaerobic exercise, as a potential diagnostic tool or method of understanding the effects of GSDS on the brain, focusing on cerebral glycogen accumulation and glucose uptake.

Methodology

A hypothetical experiment is outlined in which healthy individuals and individuals with GSD type 1 undergo a 30-minute anaerobic workout, consisting of sprinting intervals of one minute and weightlifting intervals of four minutes. Brain PET scans of both groups are administered one week prior to the study and during the study, post-exercise. These PET scans are performed using the radiotracer N-(methyl-(2-fluoroethyl)-1H-triazole-4-yl)glucosamine (18F-NFTC) to detect glycogen accumulation and glucose uptake. This radiotracer is able to detect glycogen accumulation and has been used in previous studies[1]. Brain regions where glycogen stores are highest, such as the striatum and hippocampus, will be analyzed. Additionally, the cortexes and thalamus—regions with high glucose uptake—will be analyzed for changes in glucose utilization.

Research Gap

While there are many facets of Glycogen Storage Diseases (GSDs) that are victims of the research gap, the neurological impacts associated with GSDs, particularly the consequences of glycogen accumulation in the brain, have been notably underexplored[2]. Despite their potential severity, these neurological manifestations are often overlooked, leading to a lack of recognition and treatment options for affected individuals, as well as untapped resources for the exploration and diagnostic use of brain glycogen accumulation.

Results

It is hypothesized that individuals with GSD type 1 will show increased glycogen accumulation in the brain post anaerobic exercise. Furthermore, a decrease in glucose uptake is expected in high glucose utilization regions. It is hypothesized that healthy individuals will show no glycogen accumulation within the brain and generally stable glucose uptake.

Recommendations and Applications

This study, while theoretical at present due to limitations in resources and opportunities, holds significant potential to advance the understanding of Glycogen Storage Diseases (GSDs), including GSD 1 and its subtypes, which remain severely understudied and misunderstood by clinicians. Future research in this area could contribute to expanding the scientific knowledge base on GSDs, with a particular focus on their neurological implications.

Brain glycogen stores, though limited in comparison to the liver and skeletal muscle, are still notably relevant for GSDs, yet remain understudied. Given the role of glycogen accumulation in the brain and its response to metabolic stress, it is recommended that future studies explore how this process varies in individuals with different health profiles. Additionally, the techniques proposed in this study could be valuable in refining the diagnostic processes for GSDs, particularly secondary to biomarker testing, which could improve the accuracy and timeliness of diagnoses, as well as cost-effectiveness- the addition of the techniques proposed in this study could heighten confidence in a positive genetic testing result, decreasing the chance of ordering a costly negative genetic test.

Conclusion

If successful, this method could offer a novel approach for understanding the cerebral influence of GSDs and could eventually serve as a diagnostic tool as well. This hypothetical study proposes that brain PET scans could provide more accurate visualization of glycogen accumulation compared to liver scans due to lower background uptake in the brain compared to in the liver and more refined techniques of reducing noise from this background uptake.

Acknowledgements

1. Witney, T. H., Carroll, L., Alam, I. S., Chandrashekran, A., Nguyen, Q. D., Sala, R., Harris, R., Dellbarandini, R. J., Agarwal, R., & Aboagye, E. O. (2014). A novel radiotracer to image glycogen metabolism in tumors by positron emission tomography. Cancer research, 74(15), 1319–1328. https://doi.org/10.1158/0008-5472.CAN-13-2768

2. Colpaert, M., Singh, P. K., Donohue, K. J., Pires, N. T., Fuller, D. D., Corti, M., Byrne, B. J., Sun, R. C., Vander Kooi, C. W., & Gentry, M. S. (2024). Neurological glycogen storage diseases and emerging therapeutics. Neurotherapeutics : the journal of the American Society for Experimental NeuroTherapeutics, 21(5), e00446. https://doi.org/10.1016/j.neurot.2024.e00446

Contact Information

vanamanaa@appstate.edu

www.linkedin.com/in/ava-vanaman-a16594327

90

The Vital Role of Sunscreen in Skin Health: Addressing Misconceptions and Enhancing Awareness Among Individuals with Melanin-Rich Skin

Yusuf Nawaz[1], **Mrs. Mishal Siddiqui**[1]
[1]Campbell University School of Osteopathic Medicine

Biography: *Yusuf Nawaz is a 3rd year medical student at Campbell School of Osteopathic Medicine in NC. He was born in Fairfax Virginia and continues to visit his hometown frequently. He has a passion for cooking various cuisines for his wife and family. He also enjoys trading stocks as a hobby and goes backcountry camping for a breath of fresh air away from the books when he can. He wants to propagate the knowledge of medicine, particularly that related to skin to all cultures and groups in the United States. His professional interests lie within Dermatology!*

Abstract

Background: Sunscreen contains chemical and physical components that block ultraviolet exposure from the sun. Exposure to ultraviolet radiation has been linked to 80-90% of skin cancers including melanoma and non melanoma cancers. The use of sunscreen has shown to reduce the risk of developing squamous cell and melanoma skin cancers. There is a common misconception among people of color, particularly in South Asian communities, that they do not require sunscreen for skin protection due to their skin containing higher densities of melanin. Although higher melanin density provides some natural defenses, it does not eliminate the risk of sun damage, premature aging, and skin cancer.

Methods: In this study, we will examine individuals who self-identify as either South Asian, South East Asian, Black, African American, or Hispanic/Latino or of these descents. We will survey parameters regarding sunscreen use and the role of colorism in motivating adherence. We have created a cross sectional survey that will be administered through social media platforms. Demographics, frequency of sunscreen use, belief in protective factors with adherence to sunscreen use will be collected. We will analyze this data through Analysis of Variance (ANOVA) and Spearman Correlation.

Results: Pending.

Conclusions: Pending.

Inspiration: My passion for this project originally stems from a personal and academic interest in public health and dermatology, particularly in addressing health disparities in communities of color. Growing up in a South Asian household, I witnessed firsthand how cultural perceptions about melanin led to misconceptions about skincare and sun protection. Recently, a friend of mine was surprised to see sunscreen on my bathroom counter and he asked me if people of color really need sun protection. This inspired me to pursue this project to bring awareness about the importance of sunscreen to promote health equity in diverse populations.

Patient-Oriented and Epidemiology Projects

REPRODUCTIVE
JUSTICE
AND
ABORTION-RELATED
PROJECTS

100

Let's Talk About Sex: Assessing the Impact of an 8-week Comprehensive Sexual Health Curriculum on Teenage Youth in Washington D.C. in Teen Promise Project

Sarah Watkins[1], Erin McLaughlin[1], Anna BuAbbud[2]
[1]George Washington University School of Medicine and Health Sciences, [2]The American College of Obstetrics and Gynecology

Biography: *Sarah Watkins is a third year medical student at the George Washington School of Medicine and Health Sciences passionate about sexual and reproductive health education and access in the adolescent population. She has been involved with leading sex-ed in Washington DC middle schools for three years, volunteering at local abortion clinics, and serves on the 2024-2025 cohort of the Developing Leaders Program through Planned Parenthood. She is an active advocate for sexual and reproductive health access for her home state of North Carolina and her current home of the DMV. In her free time, she loves to collect frog trinkets, bake cakes, watch the newest sci-fi film or series, and meander around the monuments of DC.*

Abstract

Background: Comprehensive sexual health programs are effective in promoting healthy behaviors for adolescents, preventing pregnancy, and decreasing STI rates (Kohler, 2008). Our curriculum, Teen Promise Project (TPP), was created by medical students to teach middle school students in Washington, DC comprehensive sexual health education. Understanding our impact through evaluation will allow us to expand this pilot program as a model for sexual health education.

Methods: Student participants completed self-assessment surveys pre- and post- course. Data was transcribed in RedCap; basic statistical analyses were used to assess initial impact. Surveys were designed to specifically target each lesson (e.g., Puberty, STIs, Healthy Relationships, Gender & Sexual Identities, etc) to pinpoint whether our message is being communicated effectively.

Results: In this cohort of 57 students in grades 6-8, the mean age was 12.09 SD 1.12. 39 (68.4%) identified as female, 16 (28.1%) as male, 2 (3.5%) as non-binary, and 1 (1.8%) did not identify with a gender. 42 (77.8%) identified as Black, 9 (16.7%) as White, 1 (1.9%) as Native American, 5 (9.3%) as Latino/a/x, and 5 (9.3%) as Other. The topic with the greatest pre-test knowledge was "Gender and Sexual Identity", with 70.7% of students reported knowing "a lot" or "everything". The topic with the least pre-test knowledge was "Sexual Activities" at 51.8%, which importantly had the largest growth posttest. There was a statistically significant increase in students reporting they knew "a lot" or "everything" about all curricula topics with a p-value of 0.039. Commonly cited topics that participants self-reported as most important to their learning included avoiding sexual disease and staying safe during sex.

Conclusion: Student self-ranking of knowledge significantly increased in each topic, demonstrating our curriculum was an effective first-pass of this material. Students began the curriculum with strong foundational knowledge in gender and sexual identity, yet lacked initial knowledge regarding sexual activities.

Inspiration: This can serve to guide provider interactions with young adolescents to center education and resources around safe sex practices and forming safe relationships. Most of the adolescents have questions but lack the language and confidence to ask, which is why keeping an open-ended question approach, ensuring confidentiality, and building rapport is vital to their encounter. This project is important to me as someone who believes knowledge about one's body from a young age is powerful beyond measure, particularly in areas limiting educational and health access.

Reproductive Justice and Abortion-Related Projects

Poster Snapshot

103

Policy Analysis: Implications of the Abortion Ban in Georgia in Relation to Maternal Deaths

Pranitha Kaza[1], **Divya Tadanki**[1], Maitri Pathak[1], Haya Fatmi[1]
[1]Georgia Institute of Technology

Biography: *Undergraduate student in the Maternal & Reproductive Health space as an intern and student researcher for three years.*

Abstract

Background: This policy memo investigates the impact of abortion bans on maternal mortality rates in the United States, emphasizing how restrictive abortion policies correlate with adverse maternal health outcomes.

Methods: By using a combination of public health data from the Georgia OASIS database and conducting a literature review based on countries and states with varying levels of abortion access, this memo highlights how legal constraints around abortion limit not only reproductive choices, but also access to critical maternal healthcare services.

Results: The findings reveal that states with stringent abortion restrictions tend to experience higher maternal mortality rates, often exacerbated by systemic inequities in healthcare access for marginalized communities, including low-income individuals, rural populations, and women of color. Decline in availability of comprehensive prenatal and emergency obstetric care in restricted states is linked to healthcare provider shortages and the closure of clinics previously offering reproductive health services.

Conclusion: These shortages contribute to delayed or inadequate care, which can be life-threatening in high-risk pregnancies. The intersectional effects of these policies, such as the overlap of abortion restrictions with existing healthcare disparities, places vulnerable populations at disproportionately higher risk for pregnancy-related complications. In response to these findings, the findings propose a set of policy recommendations aimed at addressing healthcare deficiencies, expanding access to reproductive and maternal care, and ensuring that maternal health policies are grounded in evidence-based practices. Suggested interventions include increasing funding for maternal health programs in underserved areas of Georgia, strengthening emergency obstetric services through these funding sources, and enacting protections for healthcare providers offering life-saving interventions.

This protection ensures that a healthcare provider is exempt from criminal prosecution if an abortion is performed to preserve the patient's life during a medical emergency. Through these measures, policymakers can work toward a more equitable healthcare landscape that prioritizes the health and safety of all pregnant individuals, helping to reduce preventable maternal deaths and improve overall maternal health outcomes.

Inspiration: Abortion access is not just a political issue, it is a fundamental aspect of healthcare that affects maternal health outcomes, socioeconomic stability, and gender equity. We have explored the consequences of restrictive policies, disparities in access, and the impact of abortion on long-term health. The broader implications of our findings suggest that comprehensive reproductive healthcare, including abortion, must be protected to ensure equitable medical care. The integration of evidence-based policies will be necessary in reducing health disparities and improving outcomes.

Reproductive Justice and Abortion-Related Projects

Poster Snapshot

Policy Analysis: Implications of the Abortion Ban in Georgia in Relation to Maternal Deaths

Pranitha S Kaza[1], Divya Tadanki[1], Maitri Pathak[1], Haya Fatmi[1]

1 College of Sciences, Georgia Institute of Technology, Atlanta, Georgia

Introduction

- Abortion bans → concerns regarding maternal mortality, where Georgia ranks **amongst the worst in the nation**
  - Abortion bans exacerbate these trends by contributing to heightened maternal death risk [1]
- Poor abortion access → **limited reproductive healthcare access** → high incidence of unsafe abortion processes → high risk pregnancies being carried to term → severe medical complications [2]

Objectives

1) Investigate the impact of abortion bans on maternal mortality in the United States, emphasizing how restrictive abortion policies → adverse maternal health outcomes

2) To highlight how legal constraints around abortion limit reproductive choices and access to critical maternal healthcare services using **public health data from Georgia OASIS** and a **literature review** based on countries and states with varying levels of abortion access

Methodology

Online Statistical Analytical Information System (OASIS) from Georgia Department of Public Health:

- Tracked pregnancy terminations from 2014-2023 to **observe trends in abortion care related to court decisions surrounding abortion legality** and access to care
  - Dobbs decision and HB 481 (a 6 week ban which has recently been overturned)
- Induced terminations per year **compared across several racial groups** to determine if race determined the amount of reported abortions performed

Related Literature

- Abortion bans expected to disproportionately impact Black women and low-income communities, who face higher maternal mortality rates and often have less access to comprehensive healthcare services [3]
- Rural areas suffer from poor healthcare infrastructure → hospital closures → worsened access for pregnant individuals in rural environments
- **Potential implications beyond individual health**
  - strain on an already fragile healthcare system → drive up maternal deaths → exacerbation of existing inequity [4]

Results/Findings

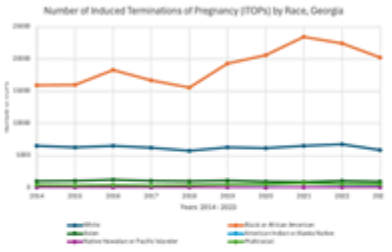


Figure 1. **Number of Induced Terminations of Pregnancy by Race (White, Black or African American, Asian, American Indian or Alaska Native, Native Hawaiian or other Pacific Islander, and Multiracial), Georgia, 2014 - 2023**

Figure 2. **Number of Induced Terminations of Pregnancy, Georgia, 2014 - 2023**

Discussion

- Induced terminations of Pregnancy in Georgia sharply decreased in 2023
  - aligns with the overturning of Roe v. Wade in 2022 → Georgia passing a 6-week ban on abortion in November 2022
  - restricted insurance coverage for abortions, reducing its accessibility
- Guttmacher Institute: 24.3% decrease in clinician-provided abortions in Georgia since 2020
  - Indicates correlation between the passing of the ban and amount of reported abortions

Recommendations

1. Policy permitting healthcare providers to perform abortions when medically necessary such as those in **California, New York, and Illinois**
2. Enabling virtual consultations for prenatal and abortion care to mitigate geographical barriers in underserved areas
3. Increase Funding for Doula Programs (**states like Minnesota and Oregon** have implemented Medicaid reimbursement for doula services)
4. Barrier remains as to persuading policymakers to take action

References

1. American Medical A., Perez, M., Adams, E., Mohammed, S., & Reed, T. (2021). Geographic Health Care Access Based Discrimination and Increased Termination of Planned Pregnancies. International Journal of Women's and Child Health and Wellness, 7(2), 178. https://doi.org/10.23176/Wjmcw.7.66

2. Gonzalez, D. (2024). The increased risk of adverse pregnancy outcomes in the United States. Journal of Health Economics, 96, 102858. https://doi.org/10.1016/j.jhealeco.2024.102858

3. Hoang, D. T., Shah, D. K., Harrison, C. J., Moniz, M. H., Chandekar, R., Lyons, H., Beestrum, M., Cohen, I., Arnold, K. A. (2023). Racial and Ethnic Disparities Following Abortion Bans in the United States: Preliminary Evidence from Difference-in-Differences Analyses. Journal of Racial and Ethnic Health Disparities, 11(4), 2148–2158. https://doi.org/10.1007/s40615-023-01682-w

4. Ziy, W. Y., Lucas, M. J., Bhat, G., Sabia, J. J., Jha, A., Thaqui, M., & Kalb, E. A. (2021). Racial/ethnic and insurance disparities in access to abortion after the United States 2005 Health Services Research, 57(1), 1–10. https://doi.org/10.1111/1475-6773.13671

5. Policy Analysis: Implications of the Abortion Ban in Georgia in Relation to Maternal Deaths. (2024). Poster Presentation, Georgia Institute of Technology, Atlanta, Georgia.

6. Guttmacher Institute. (2024). Restrictions Push Abortion Rates and Access Into Reverse, Even Before Roe Is Overturned. Guttmacher Institute. https://www.guttmacher.org/2024/06/restrictions-push-abortion-rates-and-access-into-reverse-even-before-roe-is-overturned

Georgia Tech College of Sciences

104

Promoting Reproductive Justice: Addressing Health Disparities and Maternal Mortality in Marginalized Communities

Leymis Alfonso-Marquez[1], **Rhieya Rahul**[2], Henry Le[3], **Yasaman Dasteh Goli**[4]
[1]Hillsborough Community College, [2]Royal College of Surgeons in Ireland, [3]University of California San Diego, [4]Edward Via College of Osteopathic Medicine

Biography: *Leymis Alfonso Marquez is a first-generation college student of Cuban descent, pursuing a bachelor's degree in psychology at Hillsborough Community College. As president of the Arete Honors Club, vice president of Psi Beta, and an ambassador for AMSA and other organizations at her local chapter, Leymis is passionate about advocating for social change and fostering inclusive environments for students from diverse backgrounds. Her research focuses on reproductive rights, advocating for equitable healthcare access and empowering individuals to make informed, autonomous decisions about their reproductive health. Drawing from her personal experiences as the child of immigrants, Leymis is committed to promoting resilience, adaptability, and systemic change in marginalized communities.*

Abstract

Background: The United States is facing a maternal health crisis that disproportionately affects marginalized communities, particularly women of color. Black women experience maternal mortality rates 2.6 times higher than white women due to systemic inequities rooted in social determinants such as poverty, housing, and access to healthcare. Despite advances in medicine, these disparities persist. A reproductive justice framework, which integrates the right to have children, not have children, and raise children in safe environments, offers a comprehensive approach to addressing these inequities and improving outcomes for underserved populations.

Methods: This project conducted a narrative review of maternal health disparities through the lens of reproductive justice. Five major databases, including MEDLINE and PubMed, were systematically searched using terms like "reproductive justice," "maternal mortality," and "health disparities." Studies addressing systemic barriers and intersectional factors were prioritized. Data synthesis used thematic analysis to identify effective interventions and persistent gaps.

Results: Findings reveal that reproductive justice-informed interventions address root causes of maternal health disparities. Community-led initiatives, such as culturally competent prenatal care and policy advocacy, have increased access to care and improved outcomes. Integrated healthcare models, combining reproductive and general health services, show promise in addressing the complex needs of marginalized populations. However, systemic barriers like restrictive abortion policies, implicit bias, and limited mental health resources remain significant challenges. Adolescents, low-income women, and LGBTQ individuals are particularly vulnerable to these inequities.

Conclusion: Reproductive justice provides a holistic framework to reduce maternal mortality and promote equity in healthcare. Addressing social determinants of health, implementing culturally competent care, and amplifying community voices are critical to systemic reform. These strategies hold significant potential to close gaps in maternal health outcomes and advance health equity.

Inspiration: Our passion for addressing maternal health disparities stems from the stark inequities faced by marginalized communities. Witnessing how systemic racism and economic inequality perpetuate poor outcomes motivates our work. Reproductive justice reimagines healthcare by centering autonomy, equity, and justice, and it amplifies the voices of underserved populations. This framework inspires a vision of a future where all individuals have access to equitable, high-quality maternal care, fostering healthier families and communities.

Reproductive Justice and Abortion-Related Projects

105

Reproductive Health and Family Planning: A Student-Led Curriculum Initiative in a State with Abortion Restrictions

Uma Reddy, Kadambari Suri, **Madison Sobarzo**, Deepak Muthyala, Isabella Berrueta, Dr. Rajesh C Miranda
[1]Texas A&M Health Science Center COM

Biography: *Madison Sobarzo is a second-year medical student at Texas A&M Health Science Center College of Medicine. Her research interest is in reproductive health education and infectious diseases in obstetrics and gynecology. In addition to being involved with Medical Students for Choice, she has also volunteered to teach a science-based sex education curriculum that aligns with Texas sex education policy at a local high school in Bryan, Texas. She has also traveled to the Dominican Republic and Peru for medical mission trips during her time in medical school. Before medical school, she participated in the Summer Undergraduate Research Program at Texas A&M Health Science Center College of Medicine, where she studied chronic alcohol use in animal models. She plans to pursue a career in obstetrics and gynecology.*

Abstract

Background: Following the Dobbs v. Jackson Women's Health Organization decision and the implementation of Texas House Bill 180, the Texas A&M College of Medicine (TAMU COM) Medical Students for Choice (MSFC) chapter responded to data indicating student dissatisfaction with family planning coverage in the curriculum. MSFC engaged faculty and peers to explore ways to integrate reproductive healthcare education into the existing curriculum, recognizing the importance of such information in the context of a changing abortion landscape in Texas.

Methods: In Fall 2023, MSFC piloted the Reproductive Health and Family Planning selective, the first student-led and multi-campus selective at TAMU COM. Conducted via Zoom, the course ran weekly for four weeks and was facilitated by reproductive healthcare professionals. Topics included Reproductive Ethics: A Case-Based Session, Understanding Birth Trauma, Reproductive Justice and Healthcare, and The Ethics of Fertility Medicine. Thirteen second-year medical students participated. At the conclusion of the course, students shared insights and completed an evaluation administered by the College of Medicine's Office of Evaluation and Assessment.

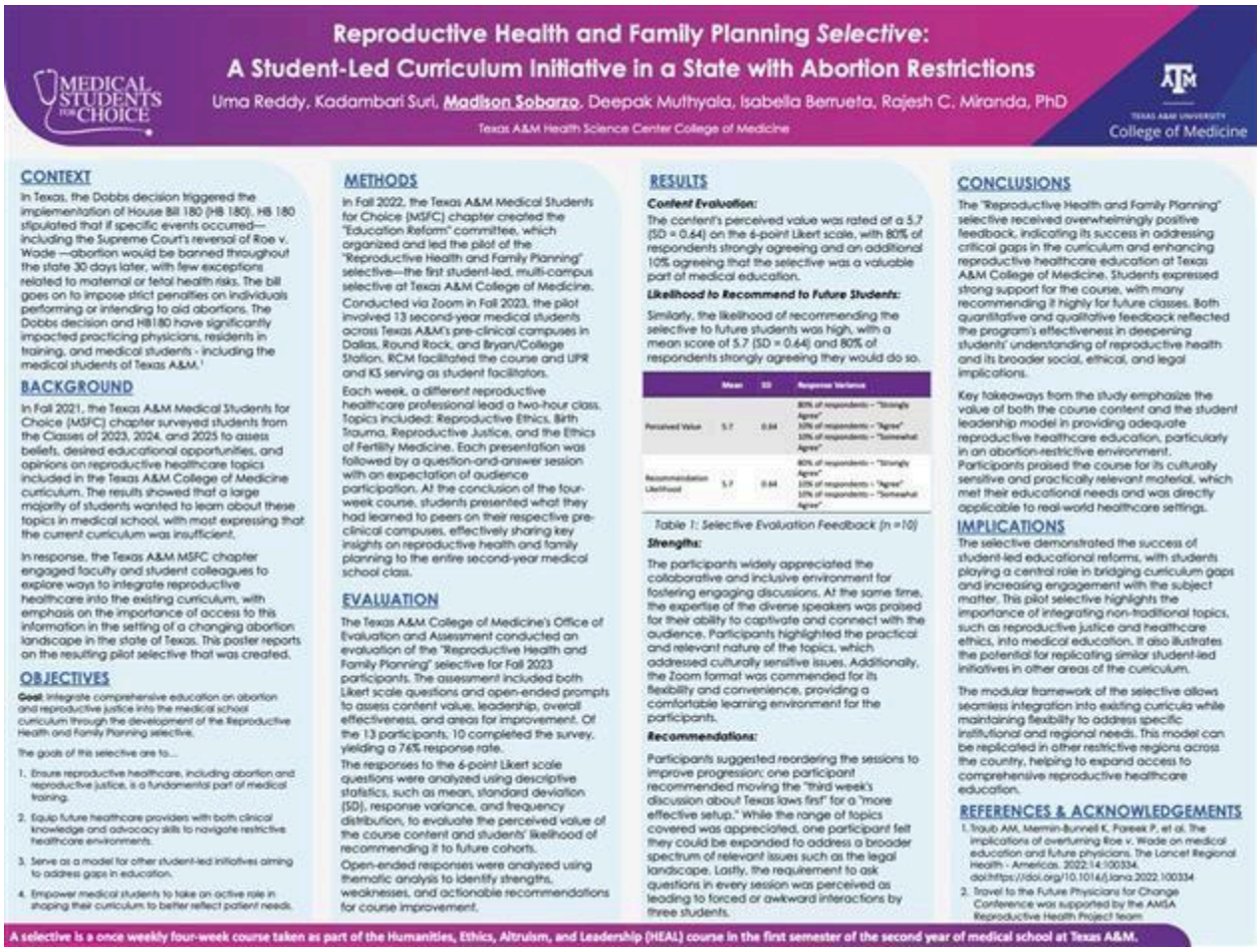
Results: Feedback was overwhelmingly positive, with students rating the course's perceived value at a mean of 5.7 on a 6-point Likert scale. Eighty percent of respondents strongly agreed that the selection was valuable to their medical education, and 80% would recommend the course to future students. Qualitative feedback emphasized the interactive and inclusive environment, with students noting that the selective feedback would influence how they care for patients and advocate for their patients in the future.

Conclusion: This pilot selection demonstrated the value of student-led initiatives in addressing curriculum gaps and increasing engagement with reproductive healthcare topics. Positive feedback underscores the need for further integration of reproductive health education, particularly in restrictive environments.

Inspiration: As medical students at TAMU COM, we identified a critical gap in our curriculum—specifically, the lack of comprehensive education on abortion and reproductive justice. The development of the Reproductive Health and Family Planning selective system allowed us to directly influence our medical education, ensuring that reproductive healthcare, including abortion and reproductive justice, is now an integral part of our training. This initiative reflects our commitment to ensuring that future healthcare providers are equipped not only with clinical knowledge but also with the advocacy tools necessary to care for patients in an evolving and restrictive healthcare environment. In sharing this project, we hope that the selection serves as a model for other student-led initiatives in medical institutions facing educational limitations on reproductive healthcare.

Reproductive Justice and Abortion-Related Projects

Poster Snapshot



Reproductive Health and Family Planning *Selective*: A Student-Led Curriculum Initiative in a State with Abortion Restrictions

Uma Reddy, Kadambari Suri, Madison Sobarzo, Deepak Muthyala, Isabella Berrueta, Rajesh C. Miranda, PhD

Texas A&M Health Science Center College of Medicine

CONTEXT

In Texas, the Dobbs decision triggered the implementation of House Bill 180 (HB 180). HB 180 stipulated that if specific events occured—including the Supreme Court's reversal of Roe v. Wade —abortion would be banned throughout the state 30 days later, with few exceptions related to maternal or fetal health risks. The bill goes on to impose strict penalties on individuals performing or intending to aid abortions. The Dobbs decision and HB180 have significantly impacted practicing physicians, residents in training, and medical students - including the medical students of Texas A&M.[1]

BACKGROUND

In Fall 2021, the Texas A&M Medical Students for Choice (MSFC) chapter surveyed students from the Classes of 2023, 2024, and 2025 to assess beliefs, desired educational opportunities, and opinions on reproductive healthcare topics included in the Texas A&M College of Medicine curriculum. The results showed that a large majority of students wanted to learn about these topics in medical school, with most expressing that the current curriculum was insufficient.

In response, the Texas A&M MSFC chapter engaged faculty and student colleagues to explore ways to integrate reproductive healthcare into the existing curriculum, with emphasis on the importance of access to this information in the setting of a changing abortion landscape in the state of Texas. This poster reports on the resulting pilot selective that was created.

OBJECTIVES

Goal: Integrate comprehensive education on abortion and reproductive justice into the medical school curriculum through the development of the Reproductive Health and Family Planning selective.

The goals of this selective are to...

1. Ensure reproductive healthcare, including abortion and reproductive justice, is a fundamental part of medical training.
2. Equip future healthcare providers with both clinical knowledge and advocacy skills to navigate restrictive healthcare environments.
3. Serve as a model for other student-led initiatives aiming to address gaps in education.
4. Empower medical students to take an active role in shaping their curriculum to better reflect patient needs.

METHODS

In Fall 2022, the Texas A&M Medical Students for Choice (MSFC) chapter created the "Education Reform" committee, which organized and led the pilot of the "Reproductive Health and Family Planning" selective—the first student-led, multi-campus selective at Texas A&M College of Medicine.

Conducted via Zoom in Fall 2023, the pilot involved 13 second-year medical students across Texas A&M's pre-clinical campuses in Dallas, Round Rock, and Bryan/College Station. IRCM facilitated the course and UPR and KS serving as student facilitators.

Each week, a different reproductive healthcare professional lead a two-hour class. Topics included: Reproductive Ethics, Birth Trauma, Reproductive Justice, and the Ethics of Fertility Medicine. Each presentation was followed by a question-and-answer session with an expectation of audience participation. At the conclusion of the four-week course, students presented what they had learned to peers on their respective pre-clinical campuses, effectively sharing key insights on reproductive health and family planning to the entire second-year medical school class.

EVALUATION

The Texas A&M College of Medicine's Office of Evaluation and Assessment conducted an evaluation of the "Reproductive Health and Family Planning" selective for Fall 2023 participants. The assessment included both Likert scale questions and open-ended prompts to assess content value, leadership, overall effectiveness, and areas for improvement. Of the 13 participants, 10 completed the survey, yielding a 76% response rate.

The responses to the 6-point Likert scale questions were analyzed using descriptive statistics, such as mean, standard deviation (SD), response variance, and frequency distribution, to evaluate the perceived value of the course content and students' likelihood of recommending it to future cohorts.

Open-ended responses were analyzed using thematic analysis to identify strengths, weaknesses, and actionable recommendations for course improvement.

RESULTS

Content Evaluation:

The content's perceived value was rated at a 5.7 (SD = 0.64) on the 6-point Likert scale, with 80% of respondents strongly agreeing and an additional 10% agreeing that the selective was a valuable part of medical education.

Likelihood to Recommend to Future Students:

Similarly, the likelihood of recommending the selective to future students was high, with a mean score of 5.7 (SD = 0.64) and 80% of respondents strongly agreeing they would do so.

	Mean	SD	Response Variance
Perceived Value	5.7	0.64	80% of respondents – "Strongly Agree" 10% of respondents – "Agree" 10% of respondents – "Somewhat Agree"
Recommendation Likelihood	5.7	0.64	80% of respondents – "Strongly Agree" 10% of respondents – "Agree" 10% of respondents – "Somewhat Agree"

Table 1: Selective Evaluation Feedback (n = 10)

Strengths:

The participants widely appreciated the collaborative and inclusive environment for fostering engaging discussions. At the same time, the expertise of the diverse speakers was praised for their ability to captivate and connect with the audience. Participants highlighted the practical and relevant nature of the topics, which addressed culturally sensitive issues. Additionally, the Zoom format was commended for its flexibility and convenience, providing a comfortable learning environment for the participants.

Recommendations:

Participants suggested reordering the sessions to improve progression; one participant recommended moving the "third week's discussion about Texas laws first" for a "more effective setup." While the range of topics covered was appreciated, one participant felt they could be expanded to address a broader spectrum of relevant issues such as the legal landscape. Lastly, the requirement to ask questions in every session was perceived as leading to forced or awkward interactions by three students.

CONCLUSIONS

The "Reproductive Health and Family Planning" selective received overwhelmingly positive feedback, indicating its success in addressing critical gaps in the curriculum and enhancing reproductive healthcare education at Texas A&M College of Medicine. Students expressed strong support for the course, with many recommending it highly for future classes. Both quantitative and qualitative feedback reflected the program's effectiveness in deepening students' understanding of reproductive health and its broader social, ethical, and legal implications.

Key takeaways from the study emphasize the value of both the course content and the student leadership model in providing adequate reproductive healthcare education, particularly in an abortion-restrictive environment. Participants praised the course for its culturally sensitive and practically relevant material, which met their educational needs and was directly applicable to real-world healthcare settings.

IMPLICATIONS

The selective demonstrated the success of student-led educational reforms, with students playing a central role in bridging curriculum gaps and increasing engagement with the subject matter. This pilot selective highlights the importance of integrating non-traditional topics, such as reproductive justice and healthcare ethics, into medical education. It also illustrates the potential for replicating similar student-led initiatives in other areas of the curriculum.

The modular framework of the selective allows seamless integration into existing curricula while maintaining flexibility to address specific institutional and regional needs. This model can be replicated in other restrictive regions across the country, helping to expand access to comprehensive reproductive healthcare education.

REFERENCES & ACKNOWLEDGEMENTS

1. Traub AM, Mermin-Bunnell K, Pareek P, et al. The implications of overturning Roe v. Wade on medical education and future physicians. The Lancet Regional Health - Americas. 2022;14:100334. doi:https://doi.org/10.1016/j.lana.2022.100334
2. Travel to the Future Physicians for Change Conference was supported by the AMSA Reproductive Health Project team

A selective is a once weekly four-week course taken as part of the Humanities, Ethics, Altruism, and Leadership (HEAL) course in the first semester of the second year of medical school at Texas A&M.

106

Reproductive Rights and Children's Health Outcomes: Exploring the Link Between Policy and Mortality Rates

Rachel Bobko[1], Kira Markowski[1], Dr. Jeannette Manger[1], Dr. Adrienne Stolfi[1]
[1]Wright State University Boonshoft School of Medicine

Biography: *Rachel is a first-year medical student at Wright State University Boonshoft School of Medicine. She graduated from Case Western Reserve University with a bachelor's degree in Biochemistry. Growing up in a small rural town in Western Pennsylvania, she didn't hear someone talk about women's health openly and without shame until attending a student organization event at her university. The physician speaking encouraged and empowered young women to take ownership over their healthcare decisions. This was instrumental in Rachel's developing passion for medicine and research pertaining to women's health and the health of gender and sexual minorities. After graduation, Rachel worked in clinical research at Cleveland Clinic Taussig Cancer Center coordinating pharmaceutical trials. In addition to her work, Rachel was an active member in her local LGBTQ+ community. She volunteered with the LGBTQ+ Community Center of Greater Cleveland, supporting the development of safe spaces for Queer-identifying individuals and allies. She also advocated for the LGBTQ+ community through research projects analyzing the experience of transgender individuals in the healthcare system and developing interventions to support healthcare access for under-resourced and unhoused transgender people. Rachel continues advocating for LGBTQ+ patients as a member of Boonshoft Pride. Additionally, she serves at the Open Arms Student-Run Free Clinic, providing care to under- and uninsured individuals from the Greater Dayton community. Rachel is also a member of the Global Health Scholars Program at BSOM. She will be spending the Summer of 2025 in Quito, Ecuador developing her medical Spanish and rotating in Ecuadorian institutional and indigenous health care settings. Rachel looks forward to developing her ability to advocate for a diverse community of patients through her medical training as well as progressing ongoing research projects pertaining to women's pregnancy care and adolescent mental healthcare.*

Abstract

Background: The literature suggests that the ability of women to choose to carry out a pregnancy when they have the necessary emotional and financial resources is associated with better outcomes for children.[1] However, the association between female reproductive healthcare access and the health outcomes of infants and children have not been well-defined.[2] Understanding the impact on childhood health and well-being is not only important in the context of pediatric medicine but also public health prevention.[3]

Methods: Data published by the National Center for Health Statistics that was compiled by County Health Rankings was utilized for this study. Data was evaluated from all 51 States/DC and their respective Reproductive Rights Index ranking. The Institute for Women's Policy Research (IWPR) utilized a composite score system evaluating various indicators of women's reproductive rights to identify their rankings.[4]

Results: An independent t-test demonstrated a statistically significant difference in 2023 reported child mortality rate ($p< 0.001$) and infant mortality rate ($p< 0.001$) in the "Bottom 5" 2022 IWPR ranked states compared to the "Top 5" 2022 IWPR ranked states. In addition, a Pearson correlation indicated a moderately strong and significant correlation where, as 2022 IWPR Index ranking increases (increased restrictions on reproductive rights), child mortality rate ($r= 0.622$, $p< 0.001$) and infant mortality rate ($r=0.524$, $p< 0.001$) also increase. A stepwise linear regression illustrated that the best fitting model, describing 38.7% of the variance in 2022 IWPR Index, was statistically significant ($F_{1,49}=30.275$, $p<0.001$). 2023 child mortality significantly contributed to the model ($B=0.701$, $t=5.502$, $p<0.001$).

Conclusion: The results suggest that restriction of female reproductive rights is not associated with improved outcomes of health and well-being for infants and children. In fact, the analysis suggests that robust female reproductive rights may be a protective factor rather than a risk factor for child and infant mortality rate.

Inspiration: There has been an alarming shift away from utilizing reliable health science research to inform healthcare policy decisions. However, it is often not our policy makers that are put in unnecessary, sometimes life-threatening, harm by these policies, but our country's most vulnerable populations. As a future physician, I believe it is my responsibility to use my expertise to amplify patient voices and advocate for the concerns and challenges that I have been entrusted to treat. Furthering research on female reproductive healthcare access can influence positive change in medical practice and policy that improves health attainment for women and children.[3]

Reproductive Justice and Abortion-Related Projects

Poster Snapshot

REPRODUCTIVE RIGHTS AND CHILDREN'S HEALTH OUTCOMES: EXPLORING THE LINK BETWEEN POLICY AND MORTALITY RATES

Rachel Bobko[1], Kira Markowski[2], Dr. Jeannette Manger, PhD[3], Dr. Adrienne Stolfi, PhD[4]

WRIGHT STATE UNIVERSITY

OBJECTIVE

Understanding the impact of reproductive rights policy on child and infant mortality rates is important in:

- Supporting pediatric health outcomes
- Public health prevention in limiting exposure to Adverse Childhood Experiences (ACES), associated with adverse health outcomes later in life[3]

METHODS

Data published by the National Center for Health Statistics that was compiled by County Health Rankings was utilized for this study.[4] Data was evaluated from all 51 States/DC and their respective Reproductive Rights Index ranking. The Institute for Women's Policy Research (IWPR) utilized a composite score system evaluating various indicators of women's reproductive rights to identify their rankings.[5] Notable index indicators include but are not limited to:

1. **"Parental consent and/or notice for abortion care for minors**
2. **Waiting periods to access abortion care**
3. **Public insurance coverage of abortion care**
4. **The share of women living in counties with at least one abortion provider"**[5]

Child and Infant Mortality Rate are Significantly Higher in the Bottom 5 2022 IWPR Ranked States Compared to the Top 5 2022 IWPR Ranked States

Table 1: Difference in Child Mortality Rate in the Top 5 IWPR Ranked States versus the Bottom 5 IWPR Ranked States

State IWPR Ranking Group	N	Mean Child Mortality Rate	Standard Deviation
Top 5 States	128	41.316	15.427
Bottom 5 States	158	70.004[a]	26.675

a. Statistically significantly different from the Top 5 States ($p < 0.001$)

Table 2: Difference in Infant Mortality in the Top 5 IWPR Ranked States versus the Bottom 5 IWPR Ranked States

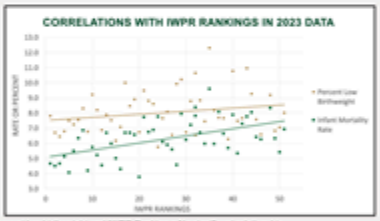
State IWPR Ranking Group	N	Mean Child Mortality Rate	Standard Deviation
Top 5 States	106	4.619	1.262
Bottom 5 States	82	7.122[a]	2.429

a. Statistically significantly different from the Top 5 States ($p < 0.001$)

Child Mortality Rate, Infant Mortality Rate, and Teen Birth Rate Increase Significantly as IWPR Ranking Increases (as access to Reproductive Rights Decreases)

Figures 1 & 2: Correlations with 2022 IWPR Rankings

- Child mortality rate and IWPR Ranking = moderately strong and significant correlation ($r = 0.622$, $p < 0.001$)
- Teen birth rate and IWPR Ranking = moderate and significant correlation ($r = 0.530$, $p < 0.001$)



- Percent low birthweight and IWPR Ranking = No significant relationship
- Infant mortality rate and IWPR Ranking = moderate and significant correlation ($r = 0.524$, $p < 0.001$)

Child Mortality Rate in 2023 Significantly Predicts 2022 IWPR Ranking

A step wise linear regression illustrated that the best fitting model, describing 38.7% of the variance in 2022 IWPR Index, was statistically significant ($F_{1,49}$=30.275, p<0.001). Child mortality rate in 2023 significantly contributed to the model (B=0.701, t=5.502, p<0.001). This indicates that with a 1% increase in child mortality rate in 2023 there was an 0.701% increase in 2022 IWPR Index Ranking (decreased access to reproductive rights).

The Top 5 2022 IWPR Ranked States Experienced a Significant Decrease in Child Mortality from 2016 to 2023, while the Bottom 5 2022 IWPR Ranked Staes Experienced No Significant Change

Table 3: Change in IWPR Rank and Grade of Top 5

State	2022 IWPR Ranking	2022 IWPR Grade	2015 IWPR Ranking	2015 IWPR Grade
New Jersey	1	A-	4	A-
California	2	A-	9	B+
Washington	3	A-	10	B+
Oregon	4	A-	1	A-
Connecticut	5	B+	6	A-

Table 4: Difference in Child Mortality Rates in the Top 5 States Between 2016 and 2023

Year	N	Mean Child Mortality	Standard Deviation
2016	122	42.684	11.159
2023	122	39.271[a]	11.445

a. Statistically significantly different from 2016 child mortality rate ($p < 0.001$)

Table 5: Change in IWPR Rank and Grade of Bottom 5

State	2022 IWPR Ranking	2022 IWPR Grade	2015 IWPR Ranking	2015 IWPR Grade
Missouri	51	F	44	D
Idaho	50	F	48	F
Nebraska	49	F	50	F
Arkansas	48	F	43	D
South Dakota	47	F	51	F

Table 6: Difference in Child Mortality Rates in the Bottom 5 States Between 2016 and 2023

Year	N	Mean Child Mortality	Standard Deviation
2016	140	65.295	22.163
2023	140	67.069	25.818

CONCLUSION

According to these findings, protections for female reproductive rights and expansion of women's reproductive healthcare programs and education could result in improved rates of child and infant mortality.

References

1. Foster DG, Biggs MA, Raifman S, Gipson J, Kimport K, Rocca CH. Comparison of Health, Development, Maternal Bonding, and Poverty Among Children Born After Denial of Abortion vs After Pregnancies Subsequent to an Abortion. JAMA Pediatr. 2018;172(11):1053-1060. doi:10.1001/jamapediatrics.2018.1785
2. Eick SM, Eatman JA, Chandler M, Brooks NR. Reproductive and Social Policies, Sociopolitical Stress, and Implications for Maternal and Child Health Equity. Curr Environ Health Rep. 2024;11(2):279-287. doi:10.1007/s40572-024-00443-w
3. SmithBattle L, Ranitden C, Cibulka N, Loman DG. Adverse Childhood Experiences as Public Health Threat. Am J Nurs. 2022;122(3):11. doi:10.1097/01.NAJ.0000822924.33625.c7
4. Health Data | County Health Rankings & Roadmaps. Accessed April 9, 2025. https://www.countyhealthrankings.org/health-data
5. Mason CN, Poyatos G. IWPR Reproductive Rights Index.

107

Similar Vascular Function and Oxidative Stress Following a High-Fat Meal in Both Men and Women

Ms. Naomi Gedion[1], Cynthia Weiner[1], Emily Blake[1], Sara Mascone[1], Shannon Khan[1], Maria da Silva[1], Steven Prior[1], Sarah Kuzmiak-Glancy, Sushant Ranadive[1]
[1]University of Maryland

Biography: *Naomi Gedion earned her Bachelor of Science in Kinesiology in 2024 and is currently a post-baccalaureate student finishing her medical school requirements by August 2025. During her undergraduate studies, she conducted research in the Human Integrative Physiology Lab at the School of Public Health, working under the mentorship of Dr. Sushant Ranadive. Naomi's research focused on vascular function and oxidative stress, particularly in relation to dietary factors such as high-fat meals, contributing to a greater understanding of cardiovascular health. Naomi is also the former president and founder of the Black Pre-Med Association (BPMA) at the University of Maryland, a subcommittee of the American Medical Student Association (AMSA). In her leadership role, she works to advocate for Black pre-medical students and promote health equity. Through BPMA, she is contributing to advancing the mission of providing resources and support for underrepresented students pursuing careers in medicine.Passionate about making a lasting impact on the healthcare system, Naomi continues to champion issues surrounding social justice, diversity, and inclusion in medicine, believing strongly in the importance of representation and equitable care for all.*

Abstract

Background: Women are largely protected against adverse effects of a stressor such as a high-fat meal (HFM) on vascular function in part due to estrogen. Estrogen possesses antioxidant properties due to binding to estrogen receptors which enhance the expression of antioxidant enzymes. However, there is limited knowledge on sex differences in oxidative stress following a HFM, and the association with vascular function.

Methods: Flow-mediated dilation (FMD), a metric of vascular function, was measured in twenty-five participants (13M/12F, 22.2 ± 2.8 y) at baseline, with FMD repeated at 2-hours-post (2HP) HFM. A sub-analysis (7M/5F) was analyzed for oxidative stress via lipid peroxidation in plasma at baseline and 2HP HFM.

Results: There was no significant main effect of sex (p=0.51), time (p=0.11) or interaction of sex and time for FMD [(men, BL: 5.67 ± 3.90%, 2HP: 7.10 ± 2.91%; women: BL: 4.91 ± 3.0%, 2HP: 6.60 ± 4.60%), (F(2,41)= 0.00, p=0.99)]. Women had higher oxidative stress than men (p=0.02), but there was no effect of time (p=0.72) or interaction of sex and time [(men, BL: 4.27 ± 0.98 μM, 2HP: 4.38 ± 1.10 μM; women: BL: 5.58 ± 1.10 μM, 2HP: 5.81 ± 1.44 μM), (F(1,10)= 0.02, p=0.89)].

Conclusion: Young, healthy men and women exhibit similar vascular function and oxidative stress following the consumption of a HFM. Maintenance of vascular function following a HFM in both men and women contrasts with previous literature, where men exhibit vascular dysfunction whereas women do not. This is the first study to determine if differences in oxidative stress could affect/account for differences in responses to a HFM in men and women. Future studies should investigate how HFM composition, including saturated fat content, affects vascular function and oxidative stress responses and could account for differences between these studies.

Inspiration: This research is driven by a desire to understand the protective role of estrogen in premenopausal women's vascular health, particularly how it influences endothelial function and oxidative stress. Estrogen's antioxidant properties are thought to protect against vascular dysfunction, yet its effects following a high-fat meal remain unclear. By exploring this, the research aims to clarify how estrogen helps maintain vascular health in women. These findings may lead to more tailored approaches in treating cardiovascular diseases, emphasizing the importance of sex-specific factors in medical care and contributing to advancing women's health in clinical practice.

Reproductive- Justice and Abortion Related Projects

108

Socioecology of Pregnancy Planning among Nulliparous Americans

Gayatri Aluri[1], Monica Keith[1]
[1]Vanderbilt University

Biography: *Gayatri Aluri (she/her) is a Vanderbilt alum, an affiliate of the Vanderbilt Anthropological Health & Data Science (AHDS) Lab, and an aspiring maternal and child health clinician-researcher. Her research interests lie in the intersections of birth and sexual health equity, gendered and racialized disparities in health and wellbeing, social movements, care work and models of care, and questions of consent, abortion, personhood, and pleasure/empowerment in gender minorities. She is especially passionate about investigating the role of Reproductive Justice RJ) in improving structural and health outcomes in minoritized communities and has a long history of organizing in and studying RJ legacies and futures in the American South. Her current work with the AHDS Lab is focused on understanding the socioecology of pregnancy planning and intendedness in diverse populations, emphasizing the importance of resisting heteropatriarchal generalizations about conception and desire. She graduated with double honors from Vanderbilt University in 2024, studying Child Development, English, and Gender and Sexuality Studies, and spent one year working in population health and patient care for underserved patients on Medicare while assisting mentor Monica Keith, director of the AHDS Lab. Gayatri will attend the Goucher College Premedical Post-Baccalaureate Program this summer and begin her journey toward medical school, hoping to remain involved in medical anthropology research and continue harnessing her training in the social sciences as she becomes a physician.*

Abstract

Background: Access to and experiences with reproductive healthcare in the United States are shaped by evolving legal, clinical, and socio-cultural factors. Decades of state-sanctioned reproductive violence targeting minoritized groups, such as forced sterilizations, have contributed to persistent disparities in reproductive agency and family planning. While social science research has examined factors influencing individuals to actively plan pregnancy, unplanned pregnancies continue to be framed as a public health concern, overlooking the broader structural and social determinants shaping reproductive decision-making. We analyzed the socio-ecological factors that contextualize both planned and unplanned pregnancies across diverse nulliparous Americans.

Methods: We examined data from an observational cohort study (2010-2013) involving a diverse sample of nulliparous Americans (n=6,436). Using socio-demographic, social support, and perceived discrimination variables, we modeled and assessed factors associated with pregnancy planning. We stratified analyses by racial and ethnic groups—non-Hispanic white, non-Hispanic Black, Hispanic, and other racialized populations— hypothesizing that the magnitude and salience of socio-cultural factors varied across groups.

Results: Among participants carrying to term, non-Hispanic white women were 2.6 times likelier to have actively planned their pregnancies compared to non-Hispanic Black mothers-to-be and 1.4 times likelier compared to Hispanic women. Across all groups, factors including being older, married, anticipating financial and emotional support from a partner, and having private or government-funded health insurance were most strongly associated with planning. However, stratified analyses revealed group-specific patterns: economic and educational factors played a larger role for non-Hispanic white women, while family and partner support were more predictive among Hispanic women.

Conclusion: Reproductive decision-making is shaped by complex socio-ecological contexts that vary across racial-ethnic groups. Findings demonstrate that unplanned pregnancies disproportionately affect Black and Hispanic women with lower levels of social support, highlighting the need for policies and public health interventions to mitigate these inequities and best support American mothers-to-be.

Inspiration: This research is driven by a commitment to understanding and addressing reproductive health disparities in America. My passion for this topic stems from academic study and firsthand experience working with racialized patients navigating complex reproductive healthcare landscapes. We need to shift conversations about unplanned pregnancy beyond stigma and toward addressing structural inequalities. As medicine evolves, integrating socio-ecological perspectives into reproductive healthcare can lead to more equitable policies and patient-centered care. By highlighting how systemic barriers shape reproductive decisions, we underscore the urgent need for comprehensive, accessible, and culturally competent reproductive health services informed by interdisciplinary research.
Reproductive-Justice and Abortion-Related Projects

Poster Snapshot

Planning in Parentheses: A Socioecological Study of Unplanned Pregnancy in Nulliparous Americans[1]

Gayatri Aluri & Monica Keith, Vanderbilt University Anthropological Health and Data Science Lab

Background

- **~40% of U.S. pregnancies are unplannned**, though rates are declining.
- Unplanned pregnancy is often **pathologized** in clinical and public health discourse, with **prevention framed as key** to "improve the nation's health".
- Providers largely adopt one of two approaches to counseling pregnant patients:
  - ***Normative***: aligns pregnancy "readiness" with middle-class milestones, excluding young, poor, and unmarried patients.
  - ***Counternormative***: prioritizes patient-defined goals over clinician judgment.
- As **political tensions escalate around birth and abortion**, understanding pregnancy planning is vital to patient care and safety.
- **One-size-fits-all approaches ignore centuries of reproductive violence**, disproportionately impacting minoritized populations.
  - **Black and Hispanic women** face medical racism, including **coercive contraception** and **sterilization**.
- Yet, socioecological predictors remain underexplored.

Methodology

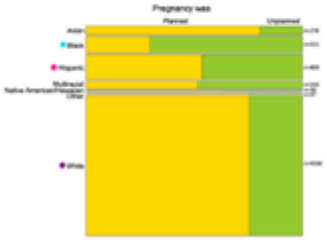
Data was collected through the NIH-funded **Nulliparous Pregnancy Outcomes Study: Monitoring Mothers-to-be (nuMoM2b)** survey from 2010-2013.

- Observational cohort data of nulliparas (n=6,436)
- Geographically diverse national sample with significant racialized cohorts: Hispanic, Non-Hispanic Black, and Non-Hispanic white
- Respondents intended to carry pregnancies to term

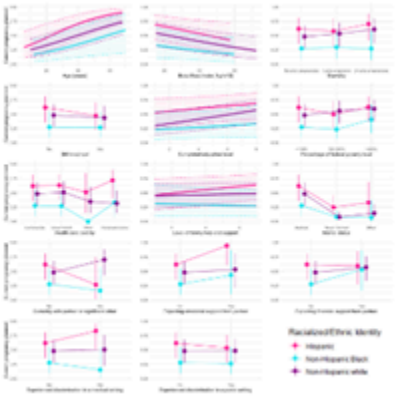
Pooled and stratified modeling was completed to assess the **socio-ecological context** of planned and unplanned pregnancies in the U.S.

- **Socio-demographic** variables (ex. age), **social support** variables (ex. expecting emotional partner support), and **perceived discrimination** variables (ex. having experienced public discrimination) evaluated.

Racialized differences in responses from women to the question **"Was this pregnancy planned?"** are **salient.**



Variable effects of socioecological factors **were identified by group.**



Results

- **Non-Hispanic white women** were **likeliest to plan** pregnancy:
  - **2.6x likelier** than **non-Hispanic Black nulliparas**
  - **1.4x likelier** than **Hispanic nulliparas**
- Being **older, married,** and **having higher educational attainment** were largely salient for **"planned"** pregnancies.
- Socioecological factors played a significant role in predicting whether pregnancy was planned or unplanned, but their **impact varied strikingly when comparing populations.**
  - Variables of **education, partner status, health insurance**, **support**, and **discrimination** varied significantly between groups.

Takeaways & Beyond

- Reproductive decision-making is shaped by complex socio-ecological contexts that vary across racial-ethnic groups.
- **Unplanned pregnancies** disproportionately occur among **Black** and **Hispanic** women **with lower levels of social support**
- Findings suggest that our most vulnerable patient populations are carrying unplanned pregnancies to term and the prevention model of care may not be appropriate as it not only presupposes unplanned pregnancies to be deviant but also fails to take an individualized, culturally sensitive approach to counseling and support for first-time parents.

Why do interdisciplinary approaches to healthcare research matter? What can the social sciences teach us to improve patient outcomes? Read more about the use of anthropology in this study:

[1] *References can be found on the second page of the document that opens when the QR code is scanned.*

109

The Cost of Gaps in Care: A Rare Convergence of Local Anesthetic Systemic Toxicity (LAST) and Preeclampsia

Jenny Lu, Ms. Alice Huang[1,2], Ms. Nicole Pancotto[1,2], Ms. Kathryn Tovar[2], Dr. Roxana Lazarescu[2]
[1]Touro College of Osteopathic Medicine Harlem, [2]Wyckoff Heights Medical Center

Biography: *Jenny is a third-year medical student at Touro College of Osteopathic Medicine in Harlem. Before pursuing her medical degree, she gained extensive experience as a registered nurse, specializing in adult medicine. She is deeply passionate about healthcare equity and population health. Outside of her academic and clinical responsibilities, Jenny cherishes spending time with her daughter, born during her medical school journey, mentoring aspiring pre-medical students, and relaxing with her beloved cats.*

Abstract

Background: This case study addresses the rare presentation of Local Anesthetic Systemic Toxicity (LAST) in the context of a postpartum seizure, compounded by atypical preeclampsia. The project explores the critical need for comprehensive prenatal care and highlights challenges in managing complications arising from limited access to reproductive healthcare, particularly in underserved and underinsured populations. The aim is to emphasize the importance of early detection and intervention to improve maternal and neonatal outcomes.

Methods: The subject of this study was a 20-year-old Spanish-speaking female who presented at 39 weeks of gestation for labor and delivery. Following an episiotomy with lidocaine injection, the patient experienced a seizure and required intensive care. A comprehensive diagnostic process included treatment for LAST with lipid emulsion therapy, evaluation for preeclampsia, pulmonary embolism, and potential central nervous system infections. Further inquiry into the patient's medical history revealed missed opportunities for hypertension management during pregnancy due to limited prenatal care. Key interventions included
magnesium sulfate for preeclampsia and supportive care in the intensive care unit for stabilization.

Results: The patient's diagnosis of LAST and atypical preeclampsia highlights the complex interplay of maternal health factors and barriers to care. Early findings suggest that limited prenatal follow-up contributed to the late recognition of hypertensive episodes, complicating delivery and postpartum management. Both mother and newborn stabilized following intensive care interventions. Data collection will focus on understanding systemic barriers to prenatal care and their role in adverse outcomes.

Conclusions: This case underscores the critical impact of timely prenatal care and the need for proactive management of hypertensive disorders in pregnancy. It illustrates the importance of healthcare equity in reducing maternal and neonatal morbidity, providing valuable insights for improving clinical protocols in underserved populations.

Inspiration: I wrote this to highlight how the current political climate has made many women hesitant to seek care due to racial and systemic barriers, leading to overlooked complications. By shedding light on this issue, I hope to inspire future physicians to advocate for equitable and accessible maternal healthcare.

Reproductive-Justice and Abortion-Related Projects

Poster Snapshot

The Cost of Gaps in Care: A Case of Lidocaine Toxicity and Postpartum Seizures

Jenny Lu OMS-III[1,2], Nicole Pancotto OMS-III[1,2], Alice Huang OMS-III[1,2], Roxana Lazarescu MD[2]

Touro College of Osteopathic Medicine Harlem Campus[1]

Wyckoff Heights Medical Center[2]

Abstract

A 20-year-old Spanish-speaking G1P0 at 39 weeks gestation experienced a seizure after lidocaine administration for episiotomy repair, necessitating ICU admission. Diagnosis revealed overlapping symptoms of LAST and preeclampsia, requiring complex management. Limited prenatal care, linguistic barriers, and systemic inequities heightened her risk for severe complications. This case underscores the critical importance of equitable access to comprehensive prenatal care and the need for vigilance in diagnosing maternal emergencies involving overlapping pathophysiology.

Introduction

1.Local Anesthetic Systemic Toxicity (LAST) occurs when a local anesthetic affects the central and cardiovascular nervous systems, potentially leading to seizures, coma, and cardiovascular collapse. Risk factors include age extremes, cardiac/renal disease, pregnancy, and block site [1]. Treatment involves intravenous lipid emulsion, which sequesters lipophilic toxins and possibly provides a cardiotonic effect [1,3].

2.Eclampsia is characterized by new-onset tonic-clonic seizures in patients with preeclampsia. Its pathophysiology involves endothelial dysfunction and altered cerebral perfusion, predisposing to seizures. Magnesium sulfate stabilizes neuronal membranes to prevent recurrence, while blood pressure is controlled with antihypertensives [4].

3.Pulmonary Embolism (PE), a consideration in this case, is more common in pregnancy and postpartum due to a hypercoagulable state and venous stasis. PE management typically includes anticoagulation with low-molecular-weight heparin [5,6].

4.Differentiating LAST and Eclampsia: Both conditions present with seizures, but LAST is often preceded by neurologic changes such as mental status alterations, while eclampsia typically involves hypertension, proteinuria, and end-organ dysfunction [1,6].

Imaging

Figure 1. CT scan of the head shows no acute intracranial abnormalities

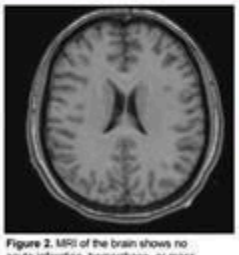


Figure 2. MRI of the brain shows no acute infarction, hemorrhage, or mass

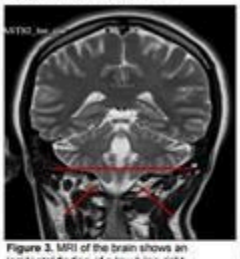


Figure 3. MRI of the brain shows an incidental finding of a low-lying right cerebellar tonsil extending 3 mm below the foramen magnum and mild paranasal sinus disease

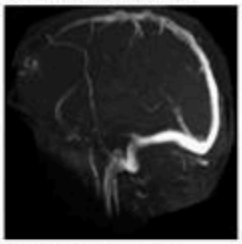


Figure 4. MR venogram shows no abnormalities in blood flow

Case Presentation

Day 1: 20-year-old G1P0 female (39 weeks gestation) presented with seizures post-delivery. Delivery was uncomplicated with episiotomy, 10 mL 2% lidocaine, and 400 mL EBL. Seizures began shortly after lidocaine; transferred to ICU with status epilepticus. Intubation complicated by aspiration. Treated with lorazepam, magnesium sulfate (eclampsia), propofol, levetiracetam, and lipid emulsion (LAST).

Day 2: EEG showed no seizures. MRI/MRV inconclusive (incidental findings). Labs stable; CXR suggested aspiration-related pulmonary consolidation. On ventilator support, patient remained stable.

Day 3: Seizure-free; extubated after 48 hours. Diagnosed with atypical eclampsia and LAST.

Day 4: Transferred to labor/delivery unit on oxygen and reunited with newborn. Discharged stable with neurology follow-up; no driving for 1 year.

Clinical Features	LAST (Local Anesthetic Systemic Toxicity)	Eclampsia
Onset	Rapid, within minutes of injection	Can occur after prolonged pre-eclampsia
Seizures	Seizures often tonic-clonic; may be brief	Generalized tonic-clonic seizures
Hypertension	Uncommon in the early stages	Present (usually >140/90)
Cardiovascular Signs	Tachycardia, hypotension, arrhythmias	Often normal, but can have elevated BP
Laboratory Findings	Elevated blood levels of local anesthetic	Proteinuria, elevated liver enzymes
Management	IV lipid emulsion, airway management	Magnesium sulfate, BP control
Risk Factors	High dose or inadvertent intravascular injection	Pregnant woman with pre-eclampsia or history of hypertension

Discussion

- This case highlights the challenges in managing obstetric emergencies in underinsured patients with limited prenatal care. The patient initiated care at 5 months gestation, potentially due to socioeconomic barriers, preventing early detection of preeclampsia risk factors like hypertension and proteinuria [7]. Preeclampsia, affecting 2-8% of pregnancies, is a leading cause of maternal and neonatal morbidity, contributing to 15% of preterm births [8]. Symptoms include hypertension and proteinuria, with additional signs like thrombocytopenia, liver dysfunction, or neurological issues [9].
- The patient's postpartum seizure was likely triggered by Local Anesthetic Systemic Toxicity (LAST), though preeclampsia remained a consideration, as it can present atypically [9]. Disparities in access to care may have exacerbated the situation, with language and cultural barriers further complicating her treatment.
- This case underscores the need to address healthcare disparities and the importance of early detection and management of complications in underinsured populations.

Systemic Inequities

- **Language Barriers:** Hindered understanding and advocacy for care.
- **Healthcare Access:** Low SES and care restrictions limited consistent prenatal access.
- **Outcome Impact:** Delayed diagnosis and fragmented care raised maternal morbidity risks.

Clinical Implications

- **Prenatal Care:** Routine hypertension screenings, multilingual education, and tailored plans improve outcomes.
- **Training:** Teams need training on managing rare complications like LAST and differentiating obstetric emergencies.

Conclusion

This case highlights the interplay between systemic healthcare barriers and complex maternal emergencies, illustrating the critical need for equitable access to prenatal care and improved training for rare but life-threatening conditions. As maternal health disparities widen under current policy constraints, addressing these inequities is crucial to improving maternal outcomes and achieving healthcare justice.

Call to Action

Addressing maternal healthcare gaps will reduce complications and improve patient outcomes.

References

110

The Impact of Abortion Restrictions on Medical Students in Georgia

Danielle Obiri[1], Rayyan Khan[1], Brenna Martin[1], Sakshi Sehgal[1], Olivia Piscano[1]
[1]Medical College of Georgia at Augusta University

Biography: *Danielle Obiri is a 3rd year MD/MPH student at the Medical College of Georgia. She is from Atlanta, GA and graduated with a BS in Genetics and a BA in African American Studies from the University of Georgia. Danielle is interested in OB/Gyn and public/global health with hopes to improve access to obstetric and gynecologic care among underserved communities.*

Abstract

Background: Following the Supreme Court Dobbs v. Jackson Women's Health Organization decision to overrule the federal right to abortion, the Georgia state legislature upheld the six-week abortion ban. These restrictions may contribute to decreased physician retention after medical school, which could exacerbate the current physician shortage and obstetric health disparities for women in the state. The goal of this study was to determine if abortion restrictions in Georgia will affect current medical students' decisions on where they submit an application to certain state residency programs in OB/GYN.

Methods: A qualitative survey was developed via Augusta University Qualtrics and distributed among students attending Georgia allopathic and allopathic medical schools. Survey responses employed a Likert scale ranking of responses ranging from "very likely" to "extremely unlikely." Data was standardized and cross-sectionally evaluated based on self-reported demographic characteristics and Likert scale responses.

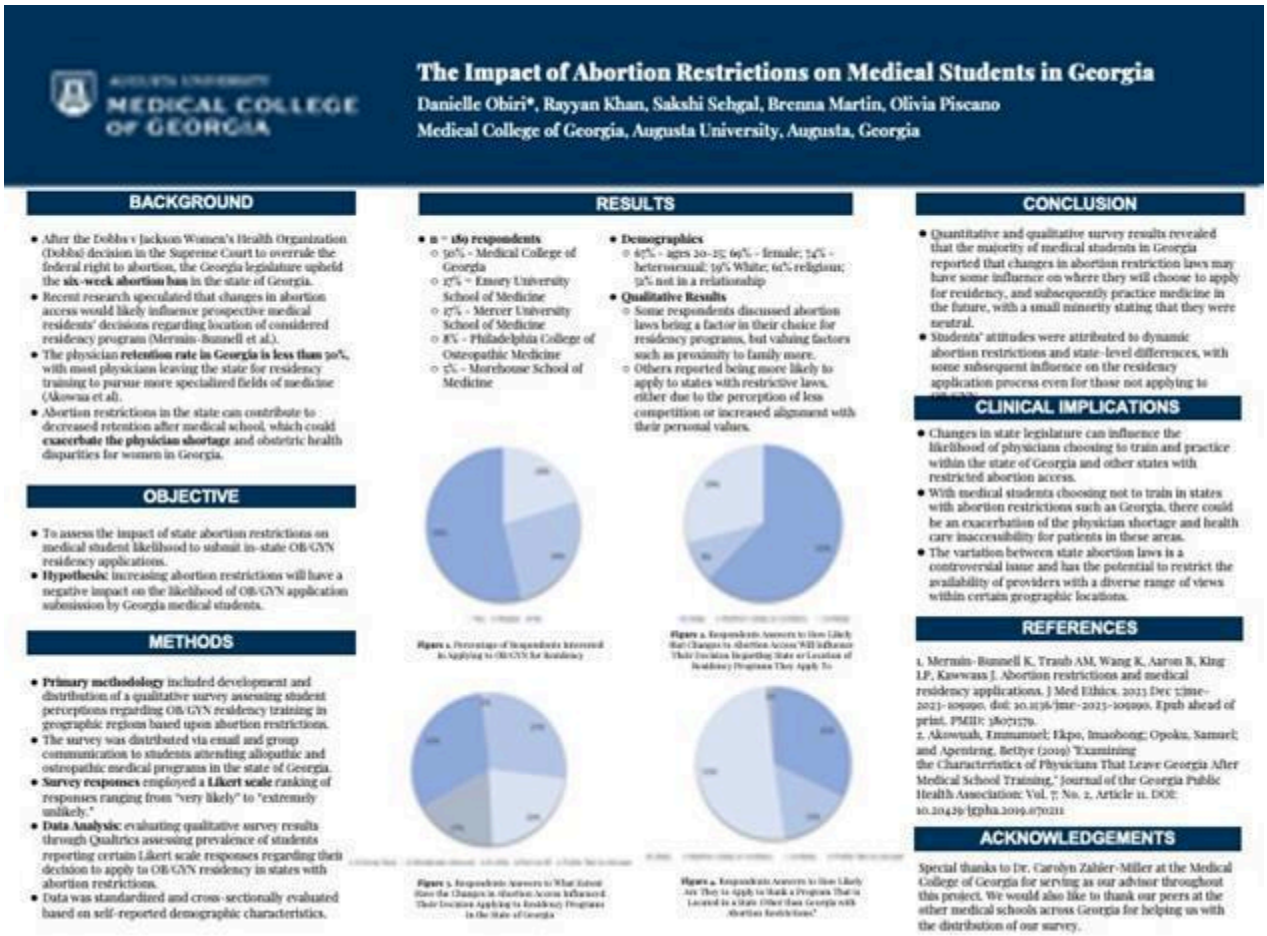
Results: Survey results included 189 respondents. 20% of respondents reported wanting to apply into OB/GYN for residency, with 26% reporting "maybe". 62% of respondents reported that they were either "very likely" or "somewhat likely" to be influenced by changes in abortion access in regard to the location or state of residency programs that they apply to. 27% of respondents reported the changes in abortion laws in Georgia had "a great deal" impact on them applying to programs in the state.

Conclusion: Quantitative and qualitative survey results revealed that the majority of medical students in Georgia reported that changes in abortion restriction laws may have some influence on where they will choose to apply for residency, and subsequently practice medicine in the future. Students' attitudes were attributed to dynamic abortion restrictions and state-level differences, with some subsequent influence on the residency application process even for those not applying to OB/GYN.

Inspiration: The inspiration behind this project was our collective passion for abortion rights and concern for the current political landscape encroaching on women's reproductive rights as it may impact physician retention and obstetric access for patients. With medical students potentially choosing not to train in states with abortion restrictions such as Georgia, there could be an exacerbation of the physician shortage and health care inaccessibility for patients in these areas and has the potential to restrict the availability of providers with a diverse range of views within certain geographic locations. We hoped to gauge the thoughts of our colleagues regarding this issue and identify some effects of abortion restriction on healthcare.

Reproductive-Justice and Abortion-Related Projects

Poster Snapshot



The Impact of Abortion Restrictions on Medical Students in Georgia

Danielle Obiri*, Rayyan Khan, Sakshi Sehgal, Brenna Martin, Olivia Piscano
Medical College of Georgia, Augusta University, Augusta, Georgia

MEDICAL COLLEGE OF GEORGIA

BACKGROUND

- After the Dobbs v Jackson Women's Health Organization (Dobbs) decision in the Supreme Court to overrule the federal right to abortion, the Georgia legislature upheld the **six-week abortion ban** in the state of Georgia.
- Recent research speculated that changes in abortion access would likely influence prospective medical residents' decisions regarding location of considered residency program (Mermin-Bunnell et al.).
- The physician **retention rate in Georgia is less than 50%**, with most physicians leaving the state for residency training to pursue more specialized fields of medicine (Akowua et al).
- Abortion restrictions in the state can contribute to decreased retention after medical school, which could **exacerbate the physician shortage** and obstetric health disparities for women in Georgia.

OBJECTIVE

- To assess the impact of state abortion restrictions on medical student likelihood to submit in-state OB/GYN residency applications.
- **Hypothesis:** increasing abortion restrictions will have a negative impact on the likelihood of OB/GYN application submission by Georgia medical students.

METHODS

- **Primary methodology** included development and distribution of a qualitative survey assessing student perceptions regarding OB/GYN residency training in geographic regions based upon abortion restrictions.
- The survey was distributed via email and group communication to students attending allopathic and osteopathic medical programs in the state of Georgia.
- **Survey responses** employed a **Likert scale** ranking of responses ranging from "very likely" to "extremely unlikely."
- **Data Analysis:** evaluating qualitative survey results through Qualtrics assessing prevalence of students reporting certain Likert scale responses regarding their decision to apply to OB/GYN residency in states with abortion restrictions.
- Data was standardized and cross-sectionally evaluated based on self-reported demographic characteristics.

RESULTS

- **n = 189 respondents**
  - 50% - Medical College of Georgia
  - 17% - Emory University School of Medicine
  - 17% - Mercer University School of Medicine
  - 8% - Philadelphia College of Osteopathic Medicine
  - 5% - Morehouse School of Medicine
- **Demographics**
  - 65% - ages 20-25; 69% - female; 74% - heterosexual; 59% White; 61% religious; 51% not in a relationship
- **Qualitative Results**
  - Some respondents discussed abortion laws being a factor in their choice for residency programs, but valuing factors such as proximity to family more.
  - Others reported being more likely to apply to states with restrictive laws, either due to the perception of less competition or increased alignment with their personal values.

CONCLUSION

- Quantitative and qualitative survey results revealed that the majority of medical students in Georgia reported that changes in abortion restriction laws may have some influence on where they will choose to apply for residency, and subsequently practice medicine in the future, with a small minority stating that they were neutral.
- Students' attitudes were attributed to dynamic abortion restrictions and state-level differences, with some subsequent influence on the residency application process even for those not applying to

CLINICAL IMPLICATIONS

- Changes in state legislature can influence the likelihood of physicians choosing to train and practice within the state of Georgia and other states with restricted abortion access.
- With medical students choosing not to train in states with abortion restrictions such as Georgia, there could be an exacerbation of the physician shortage and health care inaccessibility for patients in these areas.
- The variation between state abortion laws is a controversial issue and has the potential to restrict the availability of providers with a diverse range of views within certain geographic locations.

REFERENCES

1. Mermin-Bunnell K, Traub AM, Wang K, Aaron B, King LP, Kawwass J. Abortion restrictions and medical residency applications. J Med Ethics. 2023 Dec 5:jme-2023-109090. doi: 10.1136/jme-2023-109090. Epub ahead of print. PMID: 38051579.
2. Akowuah, Emmanuel; Ekpo, Imaobong; Opoku, Samuel; and Apenteng, Bettye (2019) "Examining the Characteristics of Physicians That Leave Georgia After Medical School Training," Journal of the Georgia Public Health Association: Vol. 7: No. 2, Article 11. DOI: 10.20429/jgpha.2019.070211

ACKNOWLEDGEMENTS

Special thanks to Dr. Carolyn Zahler-Miller at the Medical College of Georgia for serving as our advisor throughout this project. We would also like to thank our peers at the other medical schools across Georgia for helping us with the distribution of our survey.

111

The Impact of the Political Climate on Reproductive Health Perceptions in Texas: A Survey-Based Analysis

Lizette Villanueva[1], **Paria Mosaffa**[1]
[1]University of Houston

Biography: *Lizette Villanueva is a fourth-year student at the University of Houston, majoring in Nutrition with a minor in Spanish. She is on the pre-medical track and is currently participating in research focused on public health and medical interventions. Lizette currently works in a nutrition lab at Baylor College of Medicine - Children's Nutrition Research Center, where she contributes to studies aimed at preventing type 2 diabetes and obesity, particularly within Hispanic populations in Houston. Additionally, she conducts research at MD Anderson Cancer Center in the Radiation Oncology Department, assessing the effects of various cancer treatments on cardiac structures. Her work reflects a commitment to healthcare, policy, and improving health outcomes in diverse and vulnerable communities.Paria Mosaffa is a third-year student at the University of Houston, majoring in Biomedical Engineering. She is on the pre-medical track and previously conducted research focused on cancer biology and therapeutic development. In addition to her academic pursuits, she has been an active member of AMSA for three years, serving as a chapter officer for two years and leading initiatives focused on healthcare access, education, and advocacy. Her experiences as an immigrant from Iran have shaped her passion for reproductive justice, healthcare equity, and supporting marginalized communities. Her work reflects a strong commitment to advancing patient care, policy, and health outcomes through leadership and advocacy.*

Abstract

Background: This project explores public awareness and opinions on Texas reproductive laws, with a focus on Houston's diverse communities. We aimed to assess whether these groups are informed about current reproductive policies and how such laws may influence their healthcare decisions. Our broader goal is to contribute to ongoing conversations about policy, advocacy, and healthcare access by understanding how different populations perceive and are affected by these issues.

Methods: We distributed a survey to Texas residents of varying ages, gender identities, sexual orientations, races/ethnicities, political affiliations, incomes, and education levels. Recruitment was done via social media and community networks, targeting both urban and rural populations. The survey included questions on knowledge of reproductive laws, personal concerns, and experiences with reproductive healthcare access. Data is being analyzed through descriptive statistics, with collection ongoing through April 2025.

Results: Preliminary results show that 66.7% of respondents are highly concerned about the impact of Texas reproductive laws on their healthcare, and 100% favor reduced government control over reproductive decisions. Many participants report that these laws have already influenced their choices, including seeking long-term contraception or considering traveling for care. Consistent with research such as the Turnaway Study, which links abortion denial to increased risks of depression and anxiety (Biggs et al., 2017; Foster et al., 2018), our respondents also express significant mental health concerns tied to limited reproductive healthcare access.

Conclusion: Our findings highlight that restrictive reproductive laws not only limit healthcare access but also contribute to mental health challenges. Policy changes that prioritize both reproductive autonomy and mental health support are essential. Ensuring accessible reproductive care can alleviate psychological distress and promote overall well-being.

Inspiration: As someone passionate about women's health and pursuing a medical career in Texas, I was driven to explore how reproductive laws affect people's lives and health. The changing legal landscape has real consequences for patient autonomy, care, and mental health. By understanding public perspectives, I hope to be a more empathetic and informed physician and advocate for accessible, patient-centered care. These findings emphasize the role future physicians must play in addressing healthcare barriers shaped by policy.

Reproductive-Justice and Abortion-Related Projects

112

Transforming Reproductive Healthcare: The Role of Telemedicine in Expanding Access and Equity

Drumi Shah[1], **Prashant_Yadav**[2]
[1]The University of Alabama in Huntsville, [2]Spartan Health Sciences University

Biography: *Drumi Shah is currently a pre-med student pursuing an MBA after completing her Bachelor of Science in Biological Sciences at the University of Alabama in Huntsville. She is also the Pre-Medical Chair for the Rising Physicians Pathway Action Committee for AMSA. Drumi's passion for advocating for reproductive health rights was ignited after attending the Reproductive Health Institute in August 2024, where she became particularly interested in the role of telemedicine in reproductive healthcare. She has also served as a student leader for Dance Marathon, a non-profit organization that raises funds to support children's healthcare. Through her involvement in AMSA and Dance Marathon, Drumi is committed to advancing health equity and supporting children's healthcare needs. Outside of academics, Drumi enjoys dancing, playing tennis and volleyball, and reading contemporary novels. She aspires to combine her medical and business education to impact healthcare policy and improve access to reproductive healthcare.*

Abstract

Background: We pursued this project to explore how telemedicine can bridge the gap in reproductive healthcare access, particularly for those facing specific barriers. The primary issues we are addressing include the lack of affordable reproductive healthcare in regions impacted by legal, geographic, or financial challenges. The vision and mission is to advocate for telemedicine as a tool for reproductive health justice, with values centered on accessibility, privacy, and patient empowerment.

Methods: Our purpose is to show how telemedicine can be used to improve access to reproductive healthcare. Research studies and data from telehealth services like Planned Parenthood and Reproductive Health Access Project were reviewed. These organizations provide resources and support for telehealth in reproductive health. The goal was to evaluate how telemedicine is beneficial, especially for the future of reproductive health access.

Results: The broader implications of our findings indicate that telemedicine significantly improves access to reproductive healthcare, especially for individuals in underserved populations and low-income communities. Virtual consultations have made services like birth control, STI treatment, prenatal and postnatal care, and abortion care more accessible and affordable. Challenges that arise include internet access, legal restrictions, and privacy and data security concerns. While the project is ongoing, data collection and final analysis will be completed by April 19, 2025.

Conclusions: Findings show that telemedicine plays a crucial role in reducing barriers to reproductive healthcare by improving access, affordability, and privacy, especially for underserved communities. Expanding telemedicine services for reproductive healthcare can help promote health equity and support reproductive justice. However, challenges like privacy concerns and limited internet access need to be addressed. Advancements in technology, especially AI tools, can make reproductive healthcare more efficient and accessible in the future.

Inspiration: We chose this topic because we believe everyone deserves access to reproductive healthcare, however, barriers such as geography, cost, and legal restrictions can limit care. Telemedicine can break down these barriers, particularly in underserved areas, with the tools individuals need to make informed healthcare decisions. Our findings point toward a future where telemedicine plays a key role in expanding access to critical services, which could revolutionize care delivery, promote health equity, and empower patients to take control of their reproductive health in a way that is private, affordable, and efficient. Telemedicine moves us one step closer to a more supportive and accessible healthcare system by enabling individuals to receive care from home.

Reproductive-Justice and Abortion-Related Projects

91

Access, Choice, and Change: Analyzing Trends in Contraceptive Use and Provider Participation in California's Family PACT Program

Yasamin Pashmineh Azar[1], Amir Reza Pashmineh Azar, Drumi Shah
[1]A.T. Still University School of Osteopathic Medicine in Arizona

Biography: *Yasamin Pashmineh Azar is a third-year medical student at A.T. Still University School of Osteopathic Medicine in Arizona (ATSU-SOMA) and Medical Chair of the Physician Pipeline campaign. She is deeply committed to serving underserved and underrepresented populations and is focused on fostering diversity within the healthcare workforce. As Medical Chair of the Physician Pipeline Program, Yasamin works to establish essential support systems and opportunities for minority and disadvantaged pre-medical and medical students, helping them to thrive in their medical careers. Yasamin is determined to work with low-income, immigrant, and vulnerable populations as a future physician. She has been dedicated to serving the underserved since her undergraduate years at UC Davis, where she worked in a student-run free clinic. She further advanced her commitment to community health during her master's program at UC Davis, where she completed a capstone project on suicide prevention in jails. In medical school, Yasamin continues to mentor future healthcare leaders and volunteers to support communities in need, striving to make a lasting impact on public health and healthcare access.*

Abstract

Background: Disparities in unintended pregnancy, abortion, and birth rates persist in the U.S. across racial, ethnic, and socioeconomic groups. This project analyzes trends in contraceptive utilization, provider participation, and client demographics in California's Family PACT Program from 2014 to 2021.

Methods: We examined multiple Family PACT datasets, including contraceptive effectiveness tiers, provider participation, contraceptive provision by county, and client demographics. Descriptive statistics and trend analyses assessed changes over time.

Results: Data analysis revealed that from 2014 to 2021, there was a notable shift in contraceptive method utilization among female clients. The use of Tier 1 methods (most effective) increased from 7% to 8%, while Tier 2 methods (moderately effective) decreased from 43% to 31%. The proportion of clients receiving no method increased from 31% to 38%. Provider participation decreased by 24.3% during this period, from 7,272 to 5,504 total providers. The number of clients receiving long-acting reversible contraceptives (LARCs) fluctuated, with implant services peaking at 38,305 clients in 2016-17 and declining to 19,250 in 2021-22. IUC services showed a similar trend, peaking at 31,890 clients in 2015-16 and decreasing to 16,923 in 2021-228. Demographic analysis revealed that Latina clients consistently comprised the largest proportion of Family PACT users, ranging from 67% to 63% between 2014 and 2021. The percentage of clients aged 20 and over increased slightly from 86% to 90% during this period.

Conclusion: Between 2014 and 2021, Family PACT experienced shifts in contraceptive preferences, declining provider participation, and fluctuating LARC use. These findings underscore the need to ensure continued access to contraceptive options and address barriers to care, especially given the provider decline and changes in healthcare funding. Further research is needed to explore factors driving these trends and their impact on reproductive health in California.

Inspiration: My passion for this project grew during my third-year clinical rotations in federally qualified health centers, where I saw firsthand the barriers low-income communities face in accessing reproductive healthcare. Limited education and resources often lead to unintended pregnancies, negatively impacting maternal and infant health. Committed to serving these populations, I aim to use this research to highlight disparities and advocate for change. This study examines trends in California's communities, identifying factors like provider shortages and increased reliance on PACT services. These findings should encourage other states to analyze their data and address gaps in reproductive healthcare access.

Reproductive-Justice and Abortion-Related Projects

Poster Snapshot

Access, Choice, and Change: Analyzing Trends in Contraceptive Use and Provider Participation in California's Family PACT Program

Yasamin Pashmineh Azar MPH[1], Amir Reza Pashmineh Azar MBS[2], Drumi Shah[3]

[1] A.T. Still University School of Osteopathic Medicine in Arizona

[2] Burrell College of Osteopathic Medicine

[3] The University of Alabama in Huntsville

Objectives

- Examine changes in contraceptive method preferences among Family PACT clients from 2014 to 2021, including shifts in Tier 1 (most effective) and Tier 2 (moderately effective) methods, and fluctuations in long-acting reversible contraceptive (LARC) usage.
- Assess the provider participation within the Family PACT Program over the study period.
- Explore demographic trends among Family PACT clients, including shifts in age groups, ethnic representation (e.g., Latina clients), and other characteristics to better understand who is accessing services and how these patterns have evolved.

Background

The Family Planning, Access, Care, and Treatment (Family PACT) Program was established in California in 1997 to address high rates of unintended pregnancies and improve reproductive health among low-income residents. Administered by the California Department of Health Care Services, the program provides free family planning services to uninsured or underinsured individuals with incomes at or below 200% of the federal poverty level. Family PACT offers a wide range of services, including contraceptive methods, STI screenings, fertility education, and sterilization procedures. Since its inception, the program has significantly reduced unintended pregnancies and improved access to reproductive health care for vulnerable populations. However, disparities in unintended pregnancy, abortion, and birth rates persist in the U.S. across racial, ethnic, and socioeconomic groups. This project analyzes trends in contraceptive utilization, provider participation, and client demographics in California's Family PACT Program from 2014 to 2021.

Methods

Data was analyzed from Family PACT datasets from the California Department of Health Care Services, which included contraceptive method effectiveness tiers, provider participation, contraceptive provision by county, and client demographics. Descriptive statistics and trend analyses were conducted to assess changes over time. Data cleaning, integration, and analysis were performed using Python (version 3.13.2), with key libraries including pandas for data manipulation, matplotlib and seaborn for data visualization.

Results

From 2014 to 2021, there was a notable shift in contraceptive method utilization among female clients. The use of Tier 1 methods (most effective) increased from 7% to 8%, while Tier 2 methods (moderately effective) decreased from 43% to 31%. The proportion of clients receiving no method increased from 31% to 38%. Provider participation decreased by 24.3% during this period, from 7,272 to 5,504 total providers.

The number of clients receiving long-acting reversible contraceptives (LARCs) fluctuated, with implant services peaking at 38,305 clients in 2016–17 and declining to 19,250 in 2021–22. Intrauterine contraceptive (IUC) services showed a similar trend, peaking at 31,890 clients in 2015–16 and decreasing to 16,923 in 2021–22.

Demographic analysis revealed that Latina clients consistently comprised the largest proportion of Family PACT users, ranging from 67% to 63% between 2014 and 2021. The percentage of clients aged 20 and over increased slightly from 86% to 90% during this period.

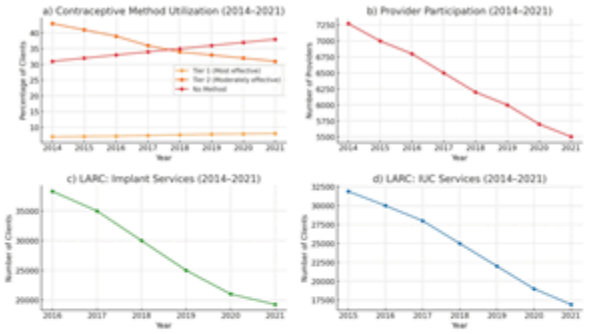


Figure. Trends in Family PACT Client Demographics, Contraceptive Use, and Provider Participation, 2014–2021.
a) Contraceptive Method Utilization: From 2014 to 2021, Tier 1 method use slightly increased (7% to 8%). Tier 2 method use decreased significantly (43% to 31%), and the percentage of clients receiving no method rose (31% to 38%).
b) Provider Participation: Total number of participating providers declined by 24.3%, from 7,272 in 2014 to 5,504 in 2021.
c) LARC – Implant Services: Implant use peaked at 38,305 clients in 2016–17 and dropped to 19,250 by 2021.
d) LARC – IUC Services: IUC services peaked at 31,890 clients in 2015–16 and declined to 16,923 in 2021.

Discussion and Conclusion

The findings from this project highlight significant shifts in contraceptive utilization, provider participation, and client demographics within California's Family PACT Program from 2014 to 2021. The declining use of Tier 2 contraceptive methods (from 43% to 31%) and the rise in clients receiving no method (from 31% to 38%) highlight potential barriers to accessing effective contraceptives, which may contribute to higher unintended pregnancy rates. The fluctuation in LARC usage, coupled with a 24.3% reduction in provider participation, further emphasizes challenges in maintaining access to comprehensive family planning services. Demographic trends, such as the slight decline in Latina clients (from 67% to 63%) and the increase in clients aged 20 and over (from 86% to 90%), reflect evolving client needs that must be addressed. These findings stress the importance of targeted interventions to rebuild the provider network, address contraceptive access gaps, and ensure equitable reproductive health care for California's diverse populations. Further research is essential to explore the underlying factors driving these trends and their broader implications for reproductive health outcomes.

References

1. California Department of Health Care Services. *Family PACT: An Overview*. https://familypact.org/wp-content/uploads/2024/04/family-PACT-Program-Fact-Sheet.pdf
2. Bixby Center for Global Reproductive Health in the Department of Obstetrics, Gynecology, and Reproductive Sciences. *Family PACT Program Report*.; 2013. Accessed April 6, 2025. https://intranet.bixbycenter.ucsf.edu/publications/files/Family%20PACT%20AR_2011-12.pdf
3. California Department of Health Care Services. *FAMILY PACT PROGRAM REPORT Office of Family Planning*.; 2017. https://familypact.org/wp-content/uploads/2023/05/FPACT-Program-Report-FY19-20.pdf
4. Foster DC, Klasle CM, Blum M, Bradsberry ME, Brindis CD, Stewart FH. Expanded State-Funded Family Planning Services: Estimating Pregnancies Averted by the Family PACT Program in California, 1997–1998. *American Journal of Public Health*. 2004;94(8):1341-1346. doi:https://doi.org/10.2105/ajph.94.8.1341
5. Matsushita T, Hasegawa T, Noma H, Ota E, Chou VB, Okada Y. Interventions to increase access to long-acting reversible contraceptives. 2021;2021(1). doi:https://doi.org/10.1002/14651858.cd014987
6. California Department of Health Care Services. *CALIFORNIA DEPARTMENT of HEALTH CARE SERVICES OFFICE of FAMILY PLANNING FAMILY PACT PROGRAM REPORT*.; 2016. Accessed April 6, 2025. https://www.dhcs.ca.gov/formsandpubs/Documents/Legislative%20Reports/FPACT-Program-Report-FY-2016-17.pdf

92

Barriers to and Facilitators of South Asian College Students' Access to Sexual and Reproductive Health Services

Ms. Zarya Shaikh
[1]Stony Brook University

Biography: *Zarya Shaikh is a first-year medical student at the New York Institute of Technology College of Osteopathic Medicine. She graduated magna cum laude and Phi Beta Kappa with a Bachelor of Science in Biochemistry and a Bachelor of Arts in Women's, Gender, and Sexuality Studies with a specialization in Public Health from Stony Brook University. She now serves as an internship director and guest lecturer at her alma mater. Before medical school, Ms. Shaikh worked as a Clinical Research Coordinator at Weill Cornell Medicine. She worked on a National Institutes of Health pandemic preparedness study to examine the prevalence and effect of enterovirus among pediatric populations nationwide. In addition, she worked as a Medical & Legal Analyst in Epidemiology for Drug & Medical Device Litigation, and Environmental Litigation at Weitz & Luxenberg. Ms. Shaikh is best known as the founder and host of Queer Diagnosis (QD): The LGBTQ+ Health Podcast. She interviews members of the LGBTQ+ community involved in the medical decision-making process, including patients and healthcare providers. Her mission is to sustain visibility and a sense of community in healthcare across the spectrum of gender and sexuality. With each episode, Ms. Shaikh continues to learn not only how to take care of patients but also one another on her journey to provide affirmative care.*

Abstract

Background: Existing studies neglect the sexual and reproductive healthcare (SRH) needs of South Asian students in the United States. As a result, students ages 17-22 are unfamiliar with the SRH services available to them and how or when to use these resources.

Methods: 23 South Asian college students (16 females, 6 males, and 1 gender-fluid individual) completed a questionnaire. A focus group and 1-on-1 interview were conducted with 4 participants. Topics of discussion included knowledge of SRH resources on campus and in their community, privacy and confidentiality, fear of judgment, and overall attitudes towards SRH.

Results: 78% of participants reported privacy and confidentiality enhanced SRH. 68% noted that a lack of cultural humility of healthcare providers contributed to poor SRH. Participants reported experiencing judgment and lack of privacy with South Asian providers while non-South Asian providers did not understand culture-specific stressors, leading to poor mental health. 80% of participants had accessed sex education during their academic careers, but many noted leaving these classes knowing less than before. LGBTQ+-specific identities were not acknowledged in sex education sessions, contributing to poor SRH for LGBTQ+ participants. Overall, participants were less likely to access SRH resources; many were encouraged to hide menstruation from male family members and avoid intimacy until marriage, especially with members of the same gender.

Conclusion: Access to resources, especially on campus, most enhanced satisfactory SRH of South Asian college students. The most significant barriers were family influences and difficulty finding a culturally-inclusive health provider that best addressed their needs without compromising confidentiality and privacy. Students can benefit from education initiatives in which they can ask questions about when and how to use SRH resources.

Inspiration: One course, Reproductive Justice, introduced the researcher to the systemic effects of global economic policies favoring commercial surrogacy and related physician practices in India. As she and her peers compared their access to SRH resources on their U.S. campus to that of their Indian counterparts, the researcher recognized a need for improvement. Young adults were reluctant to seek care because of the “taboo” of SRH. Their experiences reminded the researcher of her immigrant parents’ difficulty conveying important medical history to their physicians. Understanding a doctor’s visit is sometimes the first and only space of contact for patients to share concerns, the researcher consulted the physicians at her institution and created a process for patient-centered affirmative care that can be adopted nationwide.

Reproductive-Justice and Abortion-Related Projects

Poster Snapshot

Barriers to and Facilitators of South Asian College Students' Access to Sexual and Reproductive Health Services

Zarya Shaikh, B.S., B.A.; Liz Montegary, Ph.D.

Introduction

- **The Problem:** Existing studies neglect the sexual and reproductive healthcare (SRH) needs of South Asian students, especially between the ages 17-22, in the United States. This demographic falls in the unexplored territory between adolescence and independent adulthood. As a result, students are unfamiliar with the SRH services available to them and how or when to use these resources.
- In comparison with their peers, Asian high school students in the United States are less likely to engage in sexual activity but also less likely to use contraceptives when sexually active [1].
- Canadian South Asian immigrant adolescents have reported the following barriers to accessing SRH resources: language barriers, lack of sex education, misinformation, and more [2].

Important Definitions

- **Affirmative Care:** Healthcare delivery that prioritizes validation of intersecting identities with respect to religion, culture, gender, and sexuality
- **Sexual Well-Being:** Secure access to good-quality information, knowledge of risks associated with unprotected sexual activity, and an overall affirmative environment [3]
- **Reproductive Well-Being:** The ability to "have a responsible, satisfying and safe sex life" and to "have the capability to have children and the freedom to decide if, when and how often to do so" [4]

Objective

- This study was intended to understand the SRH needs of South Asian students at Stony Brook University and to create recommendations for college student-centered education initiatives on campus.

Methodology

- 23 South Asian students (16 females, 6 males, and 1 gender-fluid individual) completed a questionnaire.
- 4 students participated in a focus group and 1-on-1 interview.
- Topics discussed included knowledge of available resources on campus, privacy and confidentiality when using resources, fear of stigma or judgment, barriers to and enhancers of satisfactory SRH healthcare, and overall attitudes toward SRH.

Results

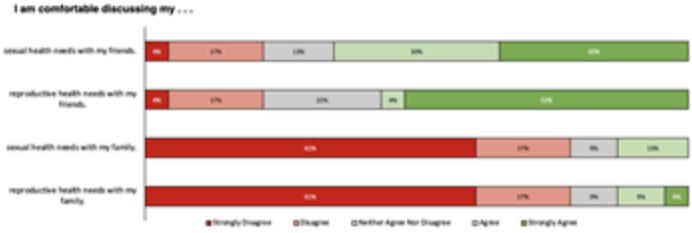


Figure 1. Participants were more comfortable discussing SRH with friends than with family.

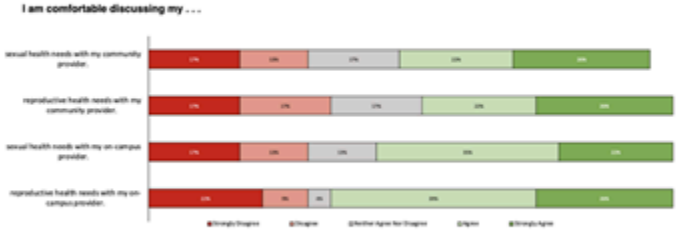


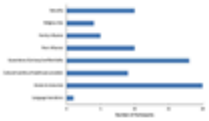
Figure 2. Participants were more comfortable discussing SRH with on-campus healthcare providers than with providers in their community.

References LinkedIn

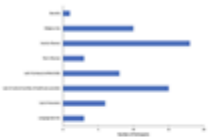
Results

- "I recently got an abortion. Because there's so much taboo surrounding sex and reproductive healthcare, especially as someone of my background, it doesn't feel like there's a safe space for me anywhere" (Participant 17).
- "My mom said people who have premarital sex have a 93% chance of going to hell" (Participant 4).

Enhancers of SRH



Barriers to SRH



Figures 3-4. Access to resources, privacy, and confidentiality most enhanced SRH. Lack of cultural humility on behalf of healthcare providers and family influence most hindered SRH.

Conclusion

- Students fostered a more positive relationship with their SRH well-being on campus than in their community overall.
- Students would benefit from education initiatives in which they can ask questions about when and how to use SRH resources.

Acknowledgements

- I want to thank Stony Brook University, Dr. Liz Montegary for guidance, and study participants throughout my project.

93

Beyond the Classroom: The Impact of Abortion Experience on Reproductive Health Competencies

Julia O'Gara[1], **Chelsea Romero**[1], Sophie Schott[1], Madison Schulz[1], Grace Drew[1], Isha Parikh[1], Dr. Elizabeth Nugent[1]
[1]McGovern Medical School at the University of Texas Health Science Center Houston

Biography: *Ms. Romero graduated with a BFA from the Fordham University/The Ailey School, after which she became a Tillman scholar, a member of AOA, and a Gold Humanism Honor Society member. She is looking forward to graduating from McGovern Medical School this year with an MD/MPH, and becoming an inaugural part of the Houston Methodist - Willowbrook OBGYN residency training program. She is also an all-around delightful, passionate person. Ms. O'Gara graduated from the Tufts/School of the Museum of Fine Arts with a BS/BFA, and is a member of AOA. She happily anticipates a preliminary year of general surgery at Baylor College of Medicine after graduating from McGovern Medical School.*

Abstract

Background: Abortion stigma creates significant educational barriers for medical trainees, especially for those in states with restricted abortion access. To address these concerns, virtual reproductive health modules that integrate patient stories with national APGO and MSFC Medical Educational Learning Objectives were developed for use throughout the preclerkship and clerkship curriculum. This interactive storytelling curriculum aims to reduce abortion stigma through exposure to patient stories, preparing students to safely care for patients in family planning, obstetrics, and gynecology. Each module targets identified gaps in medical students' reproductive health knowledge.

Methods: To identify gaps in medical student's reproductive health knowledge, a 25-item questionnaire was administered to medical students at three Houston-area medical schools. Descriptive and correlation statistics were used to examine the relationships between self-reported comfort level, previous training opportunities, and lived experiences related to pregnancy and reproductive health. Data collection for the first iteration of the survey will be complete by April 19, 2025, but data collection from the survey will be ongoing as it will be repeated serially for the next four years to assess changes in student knowledge and comfort levels with various reproductive health topics over time. Data collection on the impact of the virtual modules will be ongoing at the time of the presentation.

Independent Student's t-tests were used to evaluate results of the survey comparing self-evaluated APGO competency levels between students with and without lived experience of abortion.

Results: Early results show a relationship between students' lived experiences and higher self-reported comfort levels with various reproductive health topics. Analysis of curricular impact is ongoing, with preliminary findings indicating that exposure to patient narratives in the virtual modules may reduce abortion stigma in medical education.

Conclusions: This project aims to reduce abortion stigma in medical education by integrating patient stories aligned with national OBGYN learning objectives for preclinical and clinical students. Each virtual module targets identified gaps in medical students' reproductive health knowledge and may be modified by educators to fit their unique institutional needs.

Reproductive-Justice and Abortion-Related Projects

94

Champions of Change

Gabrielle Bowen[1], Zoe Goldberger, Lily Sloan, Haley Pollock, Kristen Liberty, Francesca Galasso, Dr Madi Lindauer, Dr Juhi Varshney, Dr Esther Choo, Dr Dara Kass, Dr Marta Rowh
[1]St. George's University School of Medicine

Biography: *Gabrielle Bowen is a third-year medical student at St. George's University. During her time there, she served on the executive board of the Women in Medicine volunteer committee, where she promoted health equity by organizing breast exams at health fairs and improving access to preventive care in low-resource settings. Before medical school, she worked with AmeriCorps as a Patient Navigator at Pittsburgh Mercy Family Health Center. In this role, she advocated for patients, enhanced their health literacy, and guided them through the complexities of the healthcare system. Gabrielle is passionate about improving healthcare access and is excited to continue advocating for patients and expanding access to reproductive care.*

Abstract

Background: Emergency physicians play a critical but often overlooked role in reproductive healthcare, especially in states with abortion bans or gestational limits. Improving the standard of care for early pregnancy loss can help normalize the use of mifepristone and misoprostol. However, gaps persist in medical education, with over 30% of U.S. medical schools failing to include abortion-related topics in their curricula. The Champions of Change program addresses these deficiencies by equipping medical students with clinical, advocacy, and leadership skills to advance reproductive health justice.

Methods: The Champions of Change program utilizes training modules and group discussions to bridge gaps in reproductive health education. Key topics include hospital policy changes to address healthcare inequities, advocating for standard-of-care improvements through specialty organizations, and navigating the impact of restrictive laws on early pregnancy loss management. Through case studies, interactive workshops, and mentorship, students develop the ability to identify and dismantle systemic barriers, ultimately preparing them to drive meaningful change in reproductive healthcare.

Results: Currently, the program has 175 medical students and includes both synchronous and asynchronous virtual components, allowing for nationwide expansion. Participants from diverse institutions form a strong network, fostering collaboration across geographic and institutional boundaries. Students engage in ongoing advocacy and research projects, reinforcing their leadership development. The Champions of Change program cultivates the next generation of EPs committed to equitable, patient-centered care.

Conclusion: By addressing critical gaps in undergraduate medical education, the Champions of Change program empowers medical students to become leaders in reproductive healthcare. The curriculum emphasizes clinical skills, policy advocacy, and leadership development, equipping students to navigate healthcare inequities and restrictive abortion laws. Interactive modules, case studies, and group discussions encourage students to examine how EPs can either facilitate access or perpetuate stigma in reproductive healthcare.

Inspiration: Medical students often feel isolated in healthcare reform efforts, leading to burnout and impeding professional identity formation. Without exposure to reproductive health advocacy, students may struggle to align personal values with their responsibilities as future physicians. By fostering mentorship and cultivating a supportive network, Champions of Change helps students find purpose in medicine.

Hands-on partnerships with organizations such as FeminEM and Access Bridge provide opportunities for direct engagement in advocacy, research, and education. Upon completing the didactic modules, students contribute to ongoing FeminEM projects and receive mentorship from field leaders. By building a community of advocates, the program aims to enact lasting, systemic change in reproductive healthcare education and delivery.

Reproductive-Justice and Abortion-Related Projects

95

Empowering Youth: A Medical Student's Role in Menstrual and Reproductive Health Education

Alexis Zazvrskey[1]
[1]Sidney Kimmel Medical College at Thomas Jefferson University

Biography: *Alexis (Lexi) Zazvrskey is a medical student in the Class of 2027 at Sidney Kimmel Medical College at Thomas Jefferson University. She earned her Bachelor of Science in Biology from Juniata College in 2022. Lexi is passionate about reproductive justice and healthcare advocacy. She serves as a board member of Medical Students for Choice, participates in legislative advocacy days in Harrisburg, PA, and attended the 2024 AMSA Reproductive Health Institute. Additionally, she is dedicated to menstrual health education, teaching adolescents who lack access to comprehensive menstrual curricula in their schools.Her research interests focus on improving patient-centered reproductive care. She has conducted research on intrauterine devices (IUDs), specifically analyzing how insertion pain is presented in online resources. Through her work in education, advocacy, and research, Lexi strives to advance accessible, stigma-free reproductive healthcare for all.*

Abstract

Background: Schools often lack adequate menstrual health education, where it is typically combined with sexual health education or omitted entirely. This lack of focus creates a significant gap in menstrual education. Youth often have a limited understanding of topics regarding menstrual product options, vulvar hygiene, and distinguishing normal from abnormal cycles. Additionally, educators may feel ill-equipped to teach this subject due to generational stigma, discomfort, or a lack of formal training.

Methods: The Period Education Project (PEP) is a national initiative that empowers medical students to establish chapters at their institutions to host PEP rallies - interactive menstrual workshops for adolescents of all genders. These sessions are conducted both in person and via Zoom, using pre-designed, age-appropriate workshop slides that ensure structured, engaging, and medically accurate information. The workshop leaders serve as role models and educators so that students can learn from aspiring healthcare professionals rather than staff who may lack confidence in discussing menstruation.

Results: The Period Education Project has reached thousands of youth across the nation, fostering open discussion and reducing the stigma surrounding menstruation. Student feedback includes increased knowledge, confidence, and comfort in managing menstrual health. Many students felt empowered to ask questions, and educators expressed their gratitude as PEP alleviates the burden of teaching a stigmatized topic.

Conclusion: PEP addresses the gaps in menstrual education to provide adolescents with essential health knowledge. The workshops provide medically accurate education in school and youth program settings, ultimately contributing to more informed and empowered youth.

Inspiration: My passion for menstrual education stems from my own lack of stigma-free education in school. Luckily, my mother and I had a close relationship to discuss available products, but did not fully understand the components or reasoning of the cycle until my college biology classes. I realize that a large number of people do not have the opportunity to take these classes or have people in their lives to discuss menstruation with, typically due to cultural or generational stigmas. By bringing period education to the communities, I get to empower the young and provide education that I wish I had for myself.

Reproductive-Justice and Abortion-Related Projects

Poster Snapshot

Empowering Youth: A Medical Student's Role in Menstrual and Reproductive Health Education

Alexis Zazvrskey
Sidney Kimmel Medical College, Thomas Jefferson University

Background

- Adolescents and young adults seek comprehensive information about menstruation.[1]
- A 2021 survey of 1,010 menstruating 13-19 Americans found: [2]
  - **74%** of students have questions about periods.
  - **Only 43%** received education on menstruation in school.

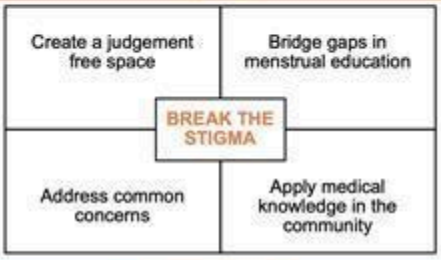
Teachers and parents may struggle to discuss menstruation due to:

- Lack of proper training
- Generational stigma
- Personal discomfort or limited knowledge

Methods

Example of workshop content: [3]

Goals



Acknowledgements

- Thank you to Trish Hutchison, MD (Executive Director), and the Period Education Project team for creating this initiative. Special thanks to Robyn Miller, MD, for starting the Sidney Kimmel Medical College chapter and to my fellow Period Pros, Jessica Button and Sharanya Suresh, for their collaboration.

Resources

[1] Schmitt ML, Gruer C, Hagstrom C, Ekua Adanu-Mensah N, Nowara A, Keeley K, Sommer M. "It always gets pushed aside." Qualitative perspectives on puberty and menstruation education in U.S.A. schools. Front Reprod Health. 2022 Oct 21;4:1018217. doi: 10.3389/frph.2022.1018217. PMID: 36339713; PMCID: PMC9630334.
[2] Thora & PERIOD. State of the period 2021. New York City (2021). Available at: https://cdn.shopify.com/s/files/1/0795/1999/files/State-of-the-Period-white-paper_Thora_PERIOD.pdf?4455788
[3] https://periodeducationproject.org/

97

From Resistance to Liberation – The Fight for Reproductive Justice

Luv Agarwal[1], **Naushad Khan**[2], Dr. Ritesh Sheth[3]
[1]All Saints University School of Medicine, [2]Windsor University School of Medicine, St. Kitts and Nevis, [3]Spartan Health Sciences University

Biography: *Luv Agarwal is a fourth-year medical student at All Saints University, School of Medicine, with a passion for internal medicine and a strong commitment to reproductive justice and health equity. Luv has worked to amplify the voices of those most impacted by restrictive reproductive policies. With a firm belief that healthcare should be rooted in justice, compassion, and patient autonomy, Luv is dedicated to challenging inequities in medicine and ensuring that future physicians are empowered to provide ethical, patient-centered care. Beyond medicine and advocacy, He enjoys exploring creativity through music, painting, and cooking. These artistic outlets help him balance his academic and professional pursuits, fostering both personal growth and a deeper understanding of the human experience.*

Abstract

Background:"How has the overturning of Roe v. Wade impacted access to abortion services across different racial and socioeconomic communities in the U.S.?" The U.S. Supreme Court's 2022 decision in Dobbs v. Jackson Women's Health Organization, which overturned Roe v. Wade, marked a critical inflection point in reproductive rights. This decision catalyzed severe restrictions or complete abortion bans in numerous states. While this legal shift affects many, marginalized communities—particularly people of color, low-income individuals, and those in rural regions—bear the greatest burden. This project explores how the loss of federal protection for abortion access disproportionately affects different communities, through the lens of reproductive justice.

Methods:A structured literature review was conducted using PubMed, JSTOR, and Google Scholar to identify U.S.-based studies published between June 2022 and March 2025. Search terms included: "Dobbs v. Jackson," "Roe v. Wade," "abortion access," "reproductive justice," "health disparities," and "racial inequity." Studies were included if they addressed abortion access post-Dobbs with a focus on racial, socioeconomic, or geographic disparities. Out of 150 articles screened, 27 met inclusion criteria and were analyzed for themes and findings.

Results: Of the 27 selected studies: 65% documented sharp declines in abortion access across Southern and Midwestern states, heavily impacting low-income communities.48% reported significant increases in travel distances to abortion clinics, with Black and Latina patients facing the highest burdens.30% highlighted heightened legal risks to patients and providers, particularly in states with criminal penalties for abortion.40% discussed telemedicine as a promising yet unevenly accessible workaround, limited by state policies and broadband access.These findings illustrate systemic inequities in post-Roe reproductive care and underscore the urgent need for advocacy and intervention grounded in justice.

Conclusion: The post-Dobbs landscape has deepened reproductive health disparities across the U.S. Legal bans alone do not eliminate the need for abortion—they instead create unsafe, inaccessible conditions for marginalized populations. Addressing this crisis requires coordinated policy reform, public health initiatives, and a reinvigoration of the medical profession's social mission.

Inspiration: This project is grounded in a commitment to amplify the voices of those most affected by reproductive oppression. As a future physician, I believe that access to comprehensive reproductive care is not just a medical issue, but a matter of civil rights, democracy, and human dignity. Medicine must resist complicity in injustice and actively work to create the equitable future we all deserve.

Reproductive-Justice and Abortion-Related Projects

98

Impact of Abortion Restrictions on Childhood Health Outcomes

Rico Carter[1], Griffin Suppa[1]
[1]Wright State University Boonshoft School of Medicine

Biography: *Rico is an M1 at Boonshoft School of Medicine at Wright State University. Rico has been involved with AMSA for eight years and has served in numerous leadership roles within the organization. He has served as a local AMSA chapter President, AMSA national Premedical Membership Director, Premedical Trustee, Community and Public Health Chair, and currently as Vice-President of Membership Elect. Rico is eager to work with the current medical student membership and expand AMSA's medical student membership to increase the organization's advocacy power as future physicians.Rico is passionate about improving access to health care for marginalized populations, more specifically to underserved communities of color, and achieving health equity in the United States and across the globe. Rico enjoys sports(watching/playing), traveling, playing video games, and spending time with family and friends.*

Abstract

Background: Abortion has been a topic for debate in the U.S. for decades. With the Supreme Court's recent overturning of Roe v. Wade, many pro-abortion advocates fear for the looming effects this policy change will have on healthcare.

Methods: In this study, we aim to study how abortion access or lack thereof influences childhood healthcare outcomes. Past research has shown a negative impact of abortion restrictions on infant survival, future socioeconomic success, and the U.S. foster care system. The study utilized data collected from County Health Rankings & Roadmaps and three abortion restriction levels created from Guttmacher.

Results: We found that states with restrictions had significantly higher infant mortality rates, percent of low birth weight, children living in poverty, and uninsured children. Conversely, states with protections had higher juvenile arrest rates and lower high school graduation rates.

Conclusion: Our data shows that abortion restrictions negatively impact childhood healthcare outcomes materialize largely at younger ages.

Inspiration: As a first-year medical student, I am deeply committed to understanding the complex relationship between policy, healthcare, and individual well-being. My research on the effects of abortion restrictions on child health outcomes is driven by a desire to bridge the gap between scientific evidence and policymaking.The decisions made by lawmakers regarding abortion policies can have profound, long-term effects on the health and development of children. Understanding the consequences of these policies is crucial not only for improving healthcare outcomes but also for ensuring that policy decisions are grounded in the best available scientific data.

By exploring how abortion restrictions impact children—both those born under restrictive conditions and those potentially affected by the dynamics of a restrictive environment—I hope to contribute valuable insights that can inform lawmakers. My goal is to provide evidence that will help create policies that support the health and well-being of children, taking into account both the immediate and long-term effects of these policies on families. This research is not just about understanding the medical outcomes, but also about applying that knowledge to real-world policy in a way that can lead to better health outcomes for children and families across the country.

Reproductive-Justice and Abortion-Related Projects

INDEX

Liberty, Kristen 94

A

Abidoye, Favour Enoch 74
Abou El-Ezz, Mohammad 42
Acosta, Zeta 56
Agarwal, Luv 34
Alabana, Jasen 115
Alfonso-Marquez, Leymis 104
Aluri, Gayatri 108
Ambah, Tamaratubor 74
Ambriz, Ashanti 23
Amorosino, Lily 67

a

agarwal, luv 97

B

Baker, Kelsey 77
Basta, Marina Samuel 64
Bello-Zap, Isabela 102
Belnap, Ethan 35
Berrueta, Isabella 105
Bhandari, Neha 16
Bhatia, Sonya 77
Bhatia, Sonya 83
Bian, Xiaohui 14
Bishayee, Anupam 16

b

benavidez, michael 50

C

Caiafa , Rachel 10
Caldwell, Elisabeth 50
Cantrell , Ryan 42
Carter, Rico 98
Cheng , Jason 10
Choi, Sooin 53

d

da Silva, Maria 107

D

Dai, James 116
Damon, Bruce 15
Dasteh Goli, Yasaman 104
Daulat, Sohail 115
Davis, John 42
Deceus, Farha 14
DeJong, Bailey 38
DelFava, Marco 113
Deoghare, Shreya 64
Reddy, Kambam Sneha 64
Anand, Daphine 15
Anderson, Hunter 55
Argenal, Andrea 77
Arslanyilmaz, Nursen 72
Arzoo, Alexander 70
Asgary, Ramin 55
Ashack, M.D., Kurt 53
Asonye, Patricia 79
Attanayake, Pavitra 73
Blake, Emily 107
Bobko, Rachel 106
Bosnoyan, Manvel 49
Bowen, Gabrielle 94
Boyer, Katrina 12
Brown, Parker 116
Brueckner-Collins, Jennifer 42
BuAbbud, Anna 100
Butani, Karina 47
Choo , Esther 94
Chou, Kian 49
Clark, Cerena 96
Cleland, Elissa 86
Cornell, Lynn 14
Diaz, Sara 115
Dimitrov, Jennifer 13
Dodd, Mackenzi 20
Drew, Grace 101, 93
Driskill, Christopher 20
Duddu, Sowmya 77
Dugger , Kari 33
Dukes, Michaela 42
Dygulski, Sylvia 63

Diaz, Andres 115
E
Edwards, Evonne 80
Elhusseiny, Khaled 14
F
Famosa, Moreen 68
Fanous, Sandra 37
Fardanesh, Hope
Fatmi, Haya 103
Fikri, Lina 18
G
Gadad, Bharathi 77
Gaetz, Adam 22
Galasso, Francesca 94
Gauthier, Betsy 116
Gedion, Naomi 107
Goetz, Lucas 38
H
Hagan, Nathaniel 73
Haidar, Zane 113
Hallur, Shreyas 115
Handler, Marc Z. 86
Haridhas, Anuradha 116
Harvey, Vincent 68
Hasan, Zarin 20
Headrick, Gabby 67
Hemida, Yasmine 63
I
Ibarra, Francisco 70
Ihms, Benjamin 102
Ihunda, Israel 74
J
Jacobs, Sydney 12
Jain, Ankit 44
K
Kachergus, Jennifer 14
Kalejaiye, Mololuwa 74
Kass , Dara 94
Katam, Atharv 21
Kaza, Pranitha 103
Kehribarian, Toros 49
Keith, Monica 108
Kemnitz, Jason 38
Kersh, Mariana 15
Khan, Elsa 5
Khan, Naushad 34
Khan, Naushad 97
Khan, Rayyan 110
L
Lajczak, Pawel 79
Lalani, Suha 58
Lang, Harrison 116
Laukaitis, Christina 15
Lazarescu, Roxana 109
Etienne, Etianna 57
Firmino Cruz , Luan 18
Fischer, Garrett 116
Flanagan, Jack 10
Freda, Tetteh-Ocloo 68
Fu, Victor 70
Goldberger, Zoe 94
Goldstein, Leslie 78
Gonzalez, Daniela 50
Gonzalez, Princesa 13, 9
Grable, John 61
Gupta, Khushboo 21
Henry, Lilianna 60
Hickson, LaTonya 14
Ho, Zibiah 23
Ho , Jason 10
Hoffman, Matthew 53
Hogan, Shannon 13
Huang, Alice 109
Hussaini, Husna 22
Iranpour, Solmaz 58
Iregui, Isabella 83
Jordan, Grace 67
Joshi, Sanika
Khan, Shannon 107
Kilic, Seyda 12
Kilroe, Kathleen
Kim, Matthew 28
King , Nakesha 10
Knowlton, Amy 83
Koehler , Tracy 80
Konyar, Mackenzie 67
Korteh, Yahya 57
Kraszpulska, Barbara 116
Kroener, Sven 20
Kurapati, Sai 81
Kuzmiak-Glancy, Sarah 107
Lindauer, Madi 94
Lingineni, Saanya 61
Linke, Jessica 38
Liu, Amelia 71
Liu, Kelsey 78

Le, Henry 104
Lee, Riah 63
Lehto, Grace 22
Lien, Molly 38
Lin, Claire 113
Linares, Karen 88
M
Ma, Yaohua 14
Madaik, Mansi 20
Maheswaran, Bairavi 36
Major, Emily 42
Majumder, Omran 10
Malhotra, Kirti 113
Mammo, Selamawit 64
Mander, Keerit 1
Mandhan, Rohan 15
Manger, Jeanette 71
Manger, Jeannette 106
Marfisee, Mary
Mariscal, Joseph 73
Markowski, Kira 106
Martin, Brenna 110
Mascone, Sara 107
Mau, Colena 70
McCalla, Cejay Alexi 74
McGarry, Colin 13
McKegg, Phillip C. 81
McLaughlin, Erin 100
McMandon, Alyssa 50
McMillan Villalobos, Paul 28
McRitchie, Bayley 4
Medina, Manuel 69
Melanson, Madeline 38
Mendoza Barrera, Angel 56
Minh, Le Huu Nhat 81
Mir, Nabaan 28
Miranda, Rajesh C 105
Mixon, Hannah 37
Molina, Katerine 50
Mosaffa, Paria 111
Motakef, Morgan 26
Mudianto , Tenny 18
Murphy, Taylor 53
Mustafa, Muhammad 81
Muthyala, Deepak 105
N
Nagel, Jory 73
Nandigam, Likhita 26, 101
Nangle, John 13
Nawaz, Muhammad 62
Nawaz, Yusuf 90
Nguyen, Chau 82
Nguyen, Dang 81
Nguyen, Gia-Binh 85
Nicastro, Jeff 10
Nigro, Alexandra 86
Nolan, Isaiah 3
Nowosad, Carla 18
Nugent, Elizabeth 101, 93
Nunes, Ali 15
Núñez, Ana 3
Nweze, Uchenna 79
n
notani, Sonali 47
O
O’Gara, Julia 101
Obi, Ogechukwu 79
Obiri, Danielle 110
O'Gara, Julia 93
Orellana, Ulises 13
Osman, Alim 86
Ostrovsky , Adam 10
P
Palusci, Vincent 40
Pancotto, Nicole 109
Parikh, Isha 101, 93
Park, Amber 81
Park, Callum 13
Parker, Dana 37
Pashmineh Azar, Amir Reza 91
Penn, Amanda 16
Perez, Maria 69
Petrovich, Riley 16
Pierson, Danielle 33
Piscano, Olivia 110
Platt, Allison 2
Pollock, Haley 94

Pashmineh Azar, Yasamin 91
Patel, Ashni 4
Patel, Priya 53
Patel, Tanvi 85
Pathak, Maitri 103
Paz, Julia 77
Q
Qiu, Weilin 32
Qu, Xiaoyao 78
R
Rahul, Rhieya 21, 104
Ram, Adith 26
Ramamoorthi, Jaishree 23
Ranadive, Sushant 107
Reddy, Anusha 19
Reddy, Uma 105
Remolina, Paria 56
Rex, Abigail 26
Reynolds , Amanda 10
Rhee, Annie 116
Riba, Chantal 82
Richards, Kate 113
Rieber, Abbey 38
Rivard, Vera 13
Rivera, Dominic 70
Robinson, Marc 26
Rodriguez, Daniel 69
Romero, Chelsea 101, 93
Rowh, Marta 94
Rutledge, Mikaylah 37
S
Sabet, Cameron J. 81
Sacheck, Jennifer 67
Salcedo, Yoalkris 8
Samford, KG 23
Sarkar, Mainak 15
Sastri, Vibha 31
Sayers, Tori 77
Schaefer, Coleman 102
Schild, Lauren 52
Schleicher, Riana 35
Schott, Sophie 101, 93
Schulz, Madison 101, 93
Schwarz, Taylor 113
Sehgal, Sakshi 110
Servaes, Sabah 2
Shah, Aarohi 3
Shah, Amar 116
Shah, Drumi 112, 91
Shah, Guneet 53
Shah, Shiv 115
Shahbazi, Darius 59
Shaikh, Rehana 34
Shaikh, Zarya 92
Shan, Kevin 61
Shannahan, Maeve 75
Shaw, Britney 81
Sheffler, Alesandra 7
Sheng, Rory 15
Sheth, Ritesh 34, 97
Shu, Gavin 28
Shukla, Anisha 49
Siddiqui, Haniya 62
Siddiqui, Mishal 62, 90
Silva, Alvin 116
Silva, Annelise 116
Silva, Aubrienne 116
Simon , Ronald 10
Sloan , Lily 94
Snyder, LeeAnne 12
Sobarzo, Madison 105
Sonn, Andrew 67
Sookhoo, Nicholas 10
Srinivasan, Nanditha 64
Srivastava, Siddharth 12
Starn, Brooke 40
Stefanski, Courtney 35
Steigman, Kaleigh 67
Stein, Haleigh 50
Stephens, Cameron 42
Stinger, Grayson 42
Stogsdill, Riley 13
Stolfi, Adrienne 106
Suppa, Griffin 98
Suri, Kadambari 105
Szeto, Clarice 82
T
Tadanki, Divya 103
Tang, Willis 28
Thompson, Aubrey 14
Tovar, Kathryn 109
Trottier, Mark 73
Tseng, Tuo-Yen 83
Popat, Divya 26
Povelaitis, Michael 86
Pratapneni, Aniket 28
Prior, Steven 107
Pritchard, Robert 29

Torres, Adalberto 85
U
Uthe, Craig 52
Uy, Guillermo 63
V
Vanaman, Ava 89
Vichaikul, Sirapa 80
Varshney , Juhi 94
Villanueva, Lizette 111
Venkat, Anjali 35
Vu, Lily 20
Venkateswaran, Aditi 67
W
Wagoner Johnson, Amy 15
Weiner, Cynthia 107
Wang, Matthew 61
Wilks, Ida 66
Waqas, Syed 58
Willette, Kyle 71
Warriner, Nicholas 73
Williams, Tamara 62
Watkins, Sarah 100
Wong, Tyler 53
Watley, Sean 67
Woolpert, Autumn 30
Waydick, Laney 20
Wu, Sherry 61
Y
Yadav, Prashant 112
Yu, Annie 29
Yao, June 82
Yune, Kaylynn 49
Z
Zazvrskey, Alexis 95
Zitser, Philip 87
Zhang, Shirley 15

Future Physicians for Change

April 17 - 19, 2025
Washington, D.C

75TH amsa ANNIVERSARY

#FP4Change2025