UNIVERSITY OF ALBERTA

Faculty of Medicine & Dentistry

22nd Annual Department of Psychiatry Research Day

Abstract Book

Keynote Address: Dr. Glen Baker

Research in the Department of Psychiatry: A Historical Perspective

Wednesday, June 5, 2024

Lister Hall

UNIVERSITY OF ALBERTA

College of Health Sciences
Faculty of Medicine & Dentistry
Department of Psychiatry

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05 June 2024

22nd Annual Research Day of the Department of Psychiatry.

Welcome,

Psychiatry Research Day 2024 showcases the hard work and successful innovation of members of our department. It celebrates recent findings from our basic, translational, and clinical research programs including work in cellular and molecular biology, AI and digital health, health systems research, and improving outcomes for historically underserved communities. Many of these programs involve collaborative research with colleagues from other departments and institutions locally, nationally, and internationally. Over the years, the Department of Psychiatry has developed strong MSc and PhD programs to complement our residency program. Together, these trainees have been phenomenally successful: presenting research at scientific conferences around the world and being recognized at the university, provincial, and national levels for scholarships and awards.

To allow everyone to appreciate the depth and range of trainees' work, we will be having a Poster Session and 10 oral presentations featuring Psychiatry Trainees Ernest Owusu, Huda Al-Shamali, Wanying Mao, Jacquelyn Paquet, Jennie Vegt, Robert McWeeny, Setayesh Modanloo, Jessica Li, Rhys P Johnson, and Bohan Hans Yang. The top presentations will be acknowledged with awards.

Our keynote speaker is Dr. Glen Baker, Professor Emeritus, Fellow of the Canadian Academy of Health Sciences, and Order of Canada Recipient. Dr. Baker is a founding member of the Neurochemical Research Unit, a past president of the Canadian College of Neuropsychopharmacology, and a former Tier 1 Canada Research Chair. He served as Chair of the Department of Psychiatry and as Associate Vice-President Research for the University of Alberta.

Our faculty speaker is Dr. Andy Greenshaw. Dr. Greenshaw is a Professor in the Department of Psychiatry and longtime Associate Chair for Research. He is the Scientific Director of the APEC Digital Hub for Mental Health and serves as the Board Chair for Mental Health Research Canada, in Toronto, and for Our House Addiction Recovery Centre in Edmonton, Alberta.

We are grateful to all our research trainees and their supervisors for their contribution to the vital research in our department. Special thanks to our organizing committee: An Bui, Huda Al-Shamali, Robert McWeeny (our graduate student representatives); Sophia Ho (Graduate Program Administrator); Drs. Allen Chan and Andy Holt (outgoing and incoming Graduate Program Directors); Marge Krowchynski (Executive Assistant); and Stephanie Russell (Academic Department Manager) for their tireless efforts in organizing this year's Research Day.

Thank you for joining us in celebrating our research accomplishments from the past year.

Best Wishes,

David Ross, MD, PhD
Professor and Chair, Department of Psychiatry
Faculty of Medicine and Dentistry, University of Alberta

ACKNOWLEDGEMENTS

The Department of Psychiatry is grateful to the following for their support:

RESEARCH DAY COMMITTEE MEMBERS (Dr. Andrew Holt, Dr. Allen Chan, Sophia Ho, Stephanie Russell, Marge Krowchynski, Huda Al-Shamali, An Bui, Robert McWeeny)

RESEARCH DAY MODERATORS (Julie Tian, Amena Thraya, Wanying Mao, Huda Al-Shamali)

RESEARCH DAY JUDGES (Dr. Allen Chan, Dr. Esther Fujiwara, Dr. Pamela Brett-MacLean, Dr. Hannah Pazderka, Dr. Nikolai Malykhin)

DEPARTMENT OF PSYCHIATRY, UNIVERSITY OF ALBERTA

FACULTY OF GRADUATE & POSTDOCTORAL STUDIES

UNIVERSITY OF ALBERTA

Faculty of Medicine & Dentistry

22nd Annual Psychiatry Research Day

Wednesday June 5th, 2024

7:30 am – 8:10 am	**Registration, Coffee, & Poster Set-up**
8:10 am – 8:15 am	**Opening Remarks** – Dr. David Ross, Psychiatry Department Chair
8:15 am – 9:15 am	**Department Speaker** – Dr. Andrew J. Greenshaw, Professor *"Navigating New Frontiers in e-Mental Health"*
9:15 am – 9:30 am	**Coffee Break**
9:30 am – 10:45 am	**Session I – Oral Presentations** Moderators: Amena Thraya & Julie Tian 1. Ernest Owusu 2. Huda Al-Shamali 3. Wanying Mao 4. Dr. Jacquelyn Paquet 5. Jennie Vegt
10:45 am – 11:45 am	**Poster Presentations & Viewing**
11:45 am – 1:00 pm	**Lunch**
1:00 pm – 2:15 pm	**Session II – Oral Presentations** Moderators: Huda Al-Shamali & Wanying Mao 1. Robert McWeeny 2. Setayesh Modanloo 3. Yutong (Jessica) Li 4. Dr. Rhys P Johnson 5. Dr. Bohan Hans Yang
2:15 pm – 2:30 pm	**Coffee Break**
2:30 pm – 3:30 pm	**Keynote Speaker** – Dr. Glen Baker Professor Emeritus, Order of Canada Recipient *"Research in the Department of Psychiatry: A Historical Perspective"*
3:30 pm – 3:45 pm	**Student Awards Presentation** – Dr. Glen Baker Professor Emeritus, Order of Canada Recipient
3:45 pm – 3:55 pm	**Public Acknowledgements** – Dr. Glen Baker, Dr. Esther Fujiwara, Dr. Lindy Van Riper
3:55 pm – 4:00 pm	**Closing Remarks** – Dr. Andrew Holt, Director of Graduate Studies

Session I – Oral Presentations

9:30 am – 10:45 am

Session II – Oral Presentations

1:00 pm – 2:15 pm

Poster Presentations

10:45 am – 11:45 am

Speaker Biographies

Dr. Andrew J. Greenshaw, University of Alberta Professor of Psychiatry and Neuroscience and Fellow of the Royal Society of Arts, trained in Europe and Canada. A Fellow of the Canadian College of Neuropsychopharmacology (CCNP), for which he served as President from 2000-2002, and the Collegium Internationale Neuropsychopharmacologicum (CINP), Andy has served as University of Alberta Associate Vice President (Research) and as a member of the Scientific Advisory Board of the CIHR Institute of Neuroscience Mental Health & Addiction. Andy has broad research interests that range from neuroscience to policy in mental health, with particular interests in AI and machine learning applications and e-health. Andy is a founding member of the University of Alberta computational psychiatry group, working closely with members of the Alberta machine intelligence institute. Since 2016 Andy has served as Scientific Director for the APEC Digital Hub for Mental Health https://mentalhealth.apec.org/, is a member of the Global Leadership Council of the e-Mental Health International Collaborative https://emhicglobal.com/about/global-leadership-council/, and the Board Chair of Mental Health Research Canada https://www.mhrc.ca/.

Dr. Glen Baker completed BSP and MSc degrees in the College of Pharmacy and a PhD (Biological Psychiatry) in the College of Medicine at the University of Saskatchewan (U of S) before doing a postdoctoral fellowship at the MRC Neuropharmacology Unit, University of Birmingham, UK. In 1977 he joined the Department of Psychiatry, University of Alberta (U of A), and in 1979, along with Drs. Bill Dewhurst and Ron Coutts, he co-founded the Neurochemical Research Unit. Glen was promoted to full Professor in the Department of Psychiatry in 1985 and has served in several administrative roles at the U of A, including Chair of Psychiatry, Associate Vice-President (Research) and Interim Chair of Pharmacology. He has been a Tier 1 Canada Research Chair and a Distinguished University Professor and has supervised or co-supervised over 40 graduate students, 23 postdoctoral fellows/research associates and 31 psychiatry residents in research programs in neurochemistry and neuropsychopharmacology. Glen has published more than 400 peer-reviewed papers and numerous other articles and abstracts and has co-edited 37 books. He is a Past-President of the Canadian College of Neuropsychopharmacology (CCNP) and a Fellow of the Canadian Academy of Health Sciences. Over the years, he has served on numerous grant panels and editorial boards and been on organizing committees for several national and international conferences. Glen has been the recipient of numerous awards and honours, including the CCNP College Medal, various awards of achievement from the U of S, McCalla and Killam Professorships and an Excellence in Mentoring Award from the U of A, and the Alberta Medical Association Medal of Honour. He is currently a Professor Emeritus, and in 2023 he was awarded membership in the Order of Canada.

Predictors of Low Resilience in Patients with Mental Health Challenges prior to Discharge from Acute Care: A Brief Resilience Scale Study.

Ernest Owusu[1], Reham Shalaby[1], Hossam Elgendy[1], Wanying Mao[1], Nermin Shalaby[1], Belinda Agyapong[1], Angela Nichols[2], Ejemai Eboreime[3], Nnamdi Nkire[1], Mobolaji A. Lawal[1], Vincent I. O. Agyapong[1,3]

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[2] Queen Elizabeth II Hospital, Alberta Health Services, Grande Prairie, Alberta, Canada.
[3] Department of Psychiatry, Dalhousie University, Halifax, Nova Scotia, Canada.

Introduction: This study investigates the prevalence and correlates of low resilience in patients with mental health challenges prior to discharge from acute care facilities.

Methods: Data were collected from 1004 participants across ten acute units in Alberta. The Brief Resilience Scale (BRS) was used to measure resilience. Demographic and clinical variables were examined for their association with low resilience using chi-square analysis and binary logistic regression.

Results: 1004 participants took part in this study; 360 (35.8%) were less than 25 years old, 348 (34.7%) were between 26 and 40 years old (inclusive) and most participants were identified as female; 550 (54.8%), and Caucasian; 625 (38.7%). The prevalence of low resilience in this cohort was 55.3%. Respondents who self-identified as female were almost two times more likely to develop low resilience (OR=1.564;95% C.I.=1.79-2.10), while other genders were four times more likely to develop low resilience (OR=3.646;95% C.I.=1.36-9.71) compared to male gender respectively when controlling for other variables. Caucasians were two times more likely to present with low resilience compared with Black participants (OR= 2.21;95% C.I.= 1.45, 3.70). Similarly, persons with diagnosis of depression were two times more likely to present with low resilience than those with bipolar disorder (OR=2.567;95% C.I.=0.1.72-3.85). Also, patients diagnosed with depression were four times, more likely to present with low resilience than those diagnosed with schizophrenia (OR=4.081;95% C.I.= 2.63-6.25), and substance use disorder (OR=4.385;95% C.I.=2.27-7.69).

Conclusion: These findings underscore the importance of comprehensive patient assessments and strengthened community support systems to enhance patient resilience post-discharge.

Funding: This work was supported by Alberta Innovates

Navigating the System: A Qualitative Study on the Barriers and Facilitators to Accessing Treatment for Peripartum Depression.

Huda Al-Shamali[1], Rachael Dong[1], Margot Jackson[2], Lisa Burback[1], Gina Wong[3], Bo Cao[1], Xin-Min Li[1], Andrew J. Greenshaw[1], Yanbo Zhang[1]

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[2] Department of Nursing, MacEwan University, Edmonton, Alberta, Canada
[3] Faculty of Health Disciplines, Athabasca University, Athabasca, Aberta, Canada

Introduction: Peripartum depression (PPD) is a prevalent and serious mental health disorder that is often underdiagnosed and undertreated. This is magnified by the limited effective and safe treatment options available to this population. Repetitive transcranial magnetic stimulation (rTMS) emerged as a non-invasive treatment for PPD, but few patients with PPD are aware of its existence.

Objective: To identify the commonly experienced triggers and symptoms of PPD, and to understand why more individuals aren't receiving PPD treatment.

Methods: We conducted 36 interviews with individuals who experienced depressive symptoms during the peripartum period as well as health providers. A descriptive interpretive thematic analysis was completed.

Results: Various personal (i.e., age), clinical (i.e., traumatic birth), situational (i.e., COVID-19, homelessness), and social (i.e., discrimination, domestic abuse) risk factors for the development of depression were discussed, as well as the symptoms experienced (i.e., guilt, intrusive thoughts). The following five themes emerged during the discussion on barriers and facilitators for PPD treatment: 1) a need for mom-centered care, 2) systemic challenges, 3) importance of education, 4) stigma and custody concerns, and 5) challenges in accessing care. Eighty-three percent of the participants were unaware of the existence of rTMS. Following a brief description, 75% were willing to receive rTMS if it was available to them.

Conclusion: Addressing the systemic and access related concerns discussed surrounding PPD treatments is a critical step towards realizing a future where patients suffering with PPD have access to safe, effective, and accessible treatments.

Depression, Anxiety, and Poor Well-being at Discharge from Psychiatric Hospitals: Prevalence and Risk Factors

Wanying Mao[1], Reham Shalaby[1], Ernest Owusu[1], Hossam Eldin Elgendy[1], Belinda Agyapong[1], Ejemai Eboreime[2], Peter Silverstone[1], Pierre Chue[1], Xin-Min Li[1], Wes Vuong[3], Valerie Taylor[4], Andrew J. Greenshaw[1], Vincent I.O. Agyapong[1,2]

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[4] Department of Psychiatry, Cumming School of Medicine, University of Calgary, Calgary, Alberta, Canada.

Introduction: Being ready for discharge is vital to successful hospital-to-home transitions. For many patients, however, the transition from psychiatric hospital care to outpatient care can be challenging. An in-depth understanding of the mental health conditions of patients at discharge is crucial and instructive for recovery research.

Objective: The purpose of this study was to determine the prevalence and risk factors of depression, anxiety, and poor well-being symptoms among patients who are about to be discharged from psychiatric units in Alberta, Canada. Our hypothesis is that those patients who are discharged after inpatient treatment will have comparable levels of depression, anxiety, and wellbeing to the general Alberta population.

Methods: This epidemiological study used a cross-sectional quantitative survey from March 8, 2022, to November 5, 2023, to assess depression, anxiety, and well-being. Participants were invited to complete an online questionnaire that contained demographics, clinical information, and responses to the PHQ-9, GAD-7, and WHO-5 questionnaires. SPSS version 25 was used to analyze the data. Descriptive, univariate, and multivariate regression analyses were employed.

Result: The study found that the prevalence of likely depression, anxiety, and poor well-being among patients about to be discharged was 37.1%, 56.4%, and 48.3%, respectively. Based on a logistic regression model, there was a statistically significant association between anxiety, depression, and poor well-being diagnoses and multiple socio-demographic and clinical factors such as ethnicity, primary mental health diagnoses, education level, housing status, depression, anxiety, and well-being at baseline.

Conclusion: Mental health assessment at discharge is a critical step in the recovery and transition of care. There is still a need for further research to identify the underlying causes and robust predictors of mental health symptoms in patients about to be discharged and to provide appropriate interventions and supportive resources both before and following discharge.

Funding: This study is funded through a grant by Alberta Innovates Health Solutions. Grant application number: 202010086. The content reported herein is those of the authors. The funders had no role in the design of this study, the decision to publish, or in the writing of this paper.

The Role of Rural Status on Psychiatric Presentation Among Emerging Adults in Alberta, Canada

Dr. Jacquelyn Paquet[1], Dr. Katharine Hibbard[1], Dr. Pamela Brett-MacLean[1]

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Introduction: Emerging adulthood (18-24) entails significant transitions, increasing vulnerability for psychiatric illness. Higher rates of anxiety, affective disorders, and risk-taking behaviors such as substance use and suicide have been observed among rural cohorts emphasizing systemic issues in healthcare access and psychosocial supports.

Objectives: This study aimed to investigate the impact of rural status on psychiatric presentation patterns among emerging adults to inform service planning.

Methods: We accessed emerging adult medical encounters (emergency visits (N=66,866)), outpatient consultations (N=479,639), inpatient psychiatric admissions (N=23,681), utilizing ICD 9 and 10 codes for psychiatric disorders from 2017 to 2022. Albertans aged 18-24 were included in the study. Data was collated and included sex, rural/urban status, and year. Univariate and regression analysis was performed.

Results: Across settings, presentations were unchanged among emerging adults. Rural populations were often seen in the emergency department for anxiety (p=0.009), mood (p=0.000), psychotic (p=0.02) and substance use disorders (p=0.000). In contrast, urban populations were seen in outpatient for anxiety (p=0.000), developmental (p=0.000), eating (p=0.002), mood (p=0.000), personality (p=0.05), and psychotic disorders (p=0.000). Inpatient admissions showed no significant rural/urban differences except for mood (p=0.000) and substance use (p=0.000) among rural cohorts. Biological sex followed epidemiological studies, with anxiety (p=0.000), eating (p=0.000), mood (p=0.000), personality (p=0.000) and self-harm (p=0.000) greater among females and developmental (p=0.000) and psychotic (p=0.000) disorders greater among males.

Conclusion: We found a difference in care access associated with rural status, noting the inequities in care access impacting preventative and intervention opportunities.

Netting Nuance: A Realist Evaluation of a Hospital-Based Arts Program through Action Learning and Patient Encounter Documentation

Jennie Vegt[1], Esther Fujiwara[1], Pamela Mathura[2], Pamela Brett-MacLean[1]

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Introduction: The Artists on the Wards (AOW) program, established over 20 years ago, offers participatory arts sessions at University of Alberta Hospital. Focused on relational arts engagement, the program aims to enhance psychological well-being in the acute care environment. While anecdotal feedback supports its value, our ongoing study explores the nuanced processes of the AOW program to guide future evaluation and quality improvement efforts.

Objectives: This study aims to understand the nuanced professional practices of artists in an acute care hospital setting. Objectives include documenting artists' practices, exploring relationships between practice descriptors and observed changes, creating a program logic model, and identifying opportunities for program improvement to better meet patient needs.

Methods: We use an "action learning" approach to engage AOW staff artists in process evaluation and develop a program logic model. Realist evaluation activities explore intervention-context-mechanism-outcome (ICMO) configurations. Patient encounter documentation from January 2023 - March 2024 is thematically analyzed to contribute to findings.

Results: Preliminary findings from action learning sessions and emerging themes from patient documentation analysis are shared. This includes a program logic model outlining rationale, impacts, and challenges, paired with initial program theories providing insights into "what works for whom, in what circumstances, and why?"

Conclusion: This presentation outlines an innovative study protocol for updating the description of an ideally implemented AOW program, highlighting effective arts-based practices. Findings will inform ongoing program evaluation and quality improvement and benefit others interested in similar arts-based programming in healthcare settings.

Funding: This work was supported by Mitacs Accelerate

MHLhub.ca; Responding to Gaps Around Awareness and Transparency of Mental Health Literacy Tools for Youth, Parents, and Youth-Facing Organizations

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Introduction: Mental Health Literacy (MHL) is foundational to mental health awareness, promotion, and recovery. It encompasses building knowledge about mental disorders, reducing stigma, fostering help seeking skills and attitudes, and obtaining and maintaining positive mental health. Because youth and adolescents carry a disproportionately elevated risk burden for mental illness onset, MHL is a foremost protective and prognostic consideration for youth. Knowledge of mental disorders, understanding stigma, and help-seeking information is often considered the responsibility of parents, guardians, and youth-facing organizations. Thus, low MHL among adults presents additional barriers to youth becoming mentally health-literate.

Objective: There is a strong need to scientifically validate MHL programs in Canada to confront the increasing prevalence and complexity of mental health risks and illnesses among youth. There have been no prior efforts to consolidate, evaluate, and categorize publicly available MHL programs in Canada. Doing so creates intriguing opportunities for public-dissemination strategies. Such efforts could allow youth, adults/guardians, and youth-facing organizations to best-determine which MHL programs are most appropriate for their youth, and which are systematically vetted for bias and effectiveness.

Methods: We undertook a large systematic review project to evaluate effectiveness, end-user accessibility & usability, demographic targeting, and risk of bias among all youth-targeted MHL programs. Inclusion criteria were multi-factorial, but mandated that studies were developed in Canada, or by Canadian researchers. We iteratively developed and piloted inclusion and exclusion criteria to address studies that were not necessarily MHL-focused but addressed one or more key-pillars of MHL (ie, anti-stigma interventions). A multi-stage review, extraction, efficacy-appraisal, and bias-appraisal process was undertaken by three independent researchers prior to proof-of-concept and web-development for the repository.

Results: Our findings, research process, and supplemental outputs were integrated into the tailor-made, user-friendly and globally accessible website *www.MHLhub.ca*. Launched in March 2024, MHLhub.ca is a nationally coordinated first-step toward improving availability and clarity of youth-targeted resources to improve mental health literacies and youth mental health outcomes.

Funding: This project was generously funded by the Public Health Agency of Canada (PHAC).

The Impact of the COVID-19 Pandemic on Fly-in-Fly-out Workers' Physical and Mental Health and Productivity at Work: A Mixed-Method Study

Setayesh Modanloo[1], Kalee Lodewyk[1], Viktoriia Kurkova[1], Derek Pierce[1], Jasmine Noble[3], Dave Gallson[3], Andrew Greenshaw[1], Jake Hayward[2]

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Introduction: Fly-in-Fly-out (FIFO) workers often travel to remote locations for extended periods of time. The challenges inherent in this lifestyle, such as prolonged separation from home and family, isolation, and the demands of working in geographically distant and often challenging environments, were further compounded by the COVID-19 pandemic.

Objectives: The primary objective of this study is to explore the effects of COVID-19 on the mental and physical well-being, as well as the productivity, of FIFO workers during the pandemic.

Methods: Using mixed-methods, we studied the multifaceted impact of the COVID-19 pandemic on FIFO workers. We carried out in-depth interviews and focus group discussions and self-administered digital surveys capturing demographic details, standardised measures such as PHQ-9, GAD-7, and WHO-5 scales, as well as specific inquiries pertaining to the pandemic's effects. Thematic analysis was applied to qualitative data.

Results: In total, nine interviews and three focus groups were completed, and seven distinct themes were identified: Reduced Productivity, Managing COVID-Related Changes, Health Degeneration, Accessing Health Resources and Services, and Negative Social Impacts. Some demonstrated effective adaptation to their altered work environment, others exhibited signs of increased substance use, burnout, and heightened levels of anger. 270 workers responded to the survey. Approximately, 44% reported worse mental health during the pandemic compared to now and 41% said their current mental health was worse than their pre-pandemic baseline. This suggests that while some have recovered, most workers continue to suffer negative effects in the post-pandemic period. Similarly, about 38% of respondents reported worse physical health during the pandemic compared to now, and 39% said that their current physical health was worse than before the pandemic, suggesting that for some, physical health was adversely affected by the pandemic and continued to decline in the post-pandemic period.
According to the participants, several factors were identified as potential contributors to adverse health impacts. These factors include the closure of gyms, difficulties with travel, lack of social contact, fear of infection, concern for family and friends, increased time away from home, and the additional stress imposed by COVID testing requirements. As a result, these challenges may have had an impact on their overall productivity. These findings underscore the intricate relationship between well-being and productivity.

Conclusion: Our study sheds light on the negative impact of the COVID-19 pandemic on FIFO workers, revealing significant challenges to their mental and physical health, as well as productivity. Our result should guide the development of tailored support mechanisms for FIFO workers, prioritising their health to optimise workplace productivity, particularly in the face of future large-scale public health disruptions and pandemics.

Funding: This work was supported by the Mood Disorders Society of Canada.

Implementation of Machine Learning in Healthcare Settings

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Introduction: With the exponential growth of publications in applying machine learning (ML) tools to healthcare settings, there is significant potential for ML to impact the field of medicine. Despite the multitude of literature around ML tools in medicine, there are very few publications supporting the implementation and feasibility of ML in medicine. Currently, Machine Learning Operations (MLOps), a set of practices that take a ML model into production, is used in a variety of fields in information technology, and industrial settings. However, the MLOps pipeline is not well researched in medical settings where there are multiple barriers to implementing ML pipelines into practice.

Objectives: Here, we detail the overview and considerations of implementing ML in healthcare

Methods: We searched four databases (Medline, EMBASE, Web of Science, Scopus) for MLOps and healthcare related papers using keywords related to ML, MLOps, and healthcare. Following the search for these terms, n = 17 studies were identified from these databases. Practices described in the papers relating to MLOps in addition to tools were extracted.

Results: The main pipeline identified within the MLOps papers contained variations of: i) defining the use-case and data collection/extraction; ii) data and feature engineering; ii) model training; iv) model evaluation; v) model validation; vi) model serving; vii) model monitoring; viii) continuous integration/continuous deployment/continuous training/continuous monitoring (CI/CD/CT/CM). Limitations and considerations for each of these steps in relation to medical applications were also discussed.

Conclusion: In conclusion, more focus should be directed on engaging healthcare stakeholders like patients, policymakers, and healthcare professionals in creating ML applications.

Funding: This work was supported by Alberta Innovates (YL) and the Alberta Graduate Excellence Scholarship (YL)

Predicting Crime Severity Among Individuals Deemed NCRMD: First Steps to Developing the Crime Severity Scale (CSS)

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Introduction: Individuals deemed Not Criminally Responsible on Account of Mental Disorder (NCRMD) typically receive indefinite treatment sentences that fall under the authority of a provincial Review Board (RB). In consultation with forensic clinicians, the RB must determine if an NCR accused is a significant threat to the public in arriving at a disposition. However, at present, little is known regarding the underlying mechanisms that drive crime severity, apart from the prediction of violent recidivism generally.

Objectives: The aim of the current study is to address the aforementioned limitation in the present literature, and clarify the most salient predictors of future crime severity, among individuals deemed NCRMD.

Methods: Patient records for the population of all NCRMD cases in Alberta, Canada (N = 369), with relevant available information, have been reviewed/coded for the presence of the predictor variables that have currently been identified in the general crime severity literature. Postdictive binary logistic regression analyses will be employed and will be presented upon completion of said statistical data analysis.

Anticipated Results and Conclusions: The results will help elucidate the most salient predictors of crime severity in NCRMD populations. Ultimately, this is an important first step towards understanding and predicting future crime severity, while additionally identifying factors to create a Crime Severity Scale. This will improve clinicians' ability to inform RB's in their decisions regarding risk of *severe* future violent behavior.

The Gut-Brain Axis and the Microbiome in Anxiety Disorders, Post-Traumatic Stress Disorder and Obsessive-Compulsive Disorder

Marnie MacKay[1], **Bohan Hans Yang**[1], Serdar M. Dursun[1,2], Glen B. Baker[1,2]

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[2] Neuroscience and Mental Health Institute, University of Alberta, Edmonton, Alberta, Canada

Introduction: The gut microbiome-immune system-brain axis has been shown in the literature to be involved in a large number of disorders. Specific to our research interests is the involvement of this axis in psychiatric disorders where anxiety is the prominent symptom.

Objectives: The relationship of the gut microbiome to stress-related disorders including generalized anxiety disorder, panic disorder, social anxiety disorder, post-traumatic stress disorder and obsessive-compulsive disorder will be explored. The potential for using probiotics and prebiotics as treatment will be reviewed.

Methods: Literature review was done on PubMed and Web of Science for articles published between 2003 to 2023.

Results: Many studies support a role of the gut microbiome in production of symptoms in these disorders and suggest the potential for pro- and prebiotics for their treatment, but there are also contradictory findings and concerns about the limitations of some of the research that has been done.

Conclusions: Matters to be considered in future research include: longer term studies with factors such as sex of the subjects, drug use, comorbidity, ethnicity/race, environmental effects, diet, and exercise taken into account; appropriate compositions of pro- and prebiotics; the translatability of studies on animal models to clinical situations; and the effects on the gut microbiome of drugs currently used to treat these disorders. Despite these challenges, this is a very active area of research that holds promise for more effective, precision treatment of these stress-related disorders in the future.

Funding: The Department of Psychiatry and Faculty of Medicine & Dentistry, University of Alberta. Supervisory funding provided by the Distinguished University Professor fund and a TRIP research allowance (TRP-GB).

Investigating Altered Retrosplenial Cortex Neuronal Activity in Shank3b Mutant Mice Model of Autism Spectrum Disorder

Amena Thraya[1,2], Yonglie Ma[1], Ian Winship[1,2], Allen Chan[1,2]

[1] Department of Psychiatry, University of Alberta, Edmonton, Alberta, Canada
[2] Neuroscience and Mental Health Institute, University of Alberta, Edmonton, Alberta, Canada

Introduction: We aim to explore changes in neuronal-level resting-state activity in autism spectrum disorder (ASD). Previous studies have identified resting-state network alterations in Shank3 mice including the retrosplenial cortex (RSC), a key hub of the default mode network. While the RSC has been implicated in spatial navigation and learning, its impairments during resting-state, in the context of ASD, remain unclear.

Objectives: Identify neuronal activity alterations associated with enhanced network resting-state activity in order to understand the neurophysiological basis of this dysfunction with larger goals identifying/understanding novel imaging biomarkers and therapeutic interventions.

Methods: We plan to generate equally sex-distributed wild-type and homozygous Shank3b knockout mice groups for comparison. To visualize neuronal activity with high spatial and temporal resolution, we will transduce the Shank3b mice with AAV PHP.eB to induce neuronal expression of GCaMP8s, a calcium indicator. Two-photon imaging in head-fixed, awake, behaving mice will be localized to the retrosplenial cortex where we will measure neuronal firing rate, firing amplitude and local synchrony.

Results: Experiments are currently in early stages, however, preliminary work with a chronic cranial window shows successful transduction of neurons with GCaMP8s. Supportive findings from lab peers demonstrate macro-level alterations in activity in the retrosplenial cortex, including hyper-connectivity and hyper-excitability. We expect to see similar cellular level changes amongst neuronal populations.

Conclusion: Following trends in previous work, we hypothesize that we will observe enhanced local synchrony and elevated spontaneous neuronal activity through increased response frequency and amplitude in the retrosplenial cortex of Shank3b mice.

Funding: This work was supported by

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How Education Professionals' Experiences Working in Remote First Nation Schools Influence How They Teach Mental Health Literacy

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Introduction: This paper discusses how the experiences of ten educators working in First Nation schools, influence how they teach mental health literacy. Research participants work in six schools in the KEE TAS KEE NOW (KTCEA) Tribal Council Education Authority in Alberta. Interviews consisted of nine research questions asked in private online Google meetings.

Objectives: Educators discussed what they thought should be in a National Indigenous Youth Mental Health Literacy Resource for improving Indigenous youths' mental health. Mental Health Literacy is: Developing and maintaining positive mental health, recognizing "mental disorders, and their treatments [while] destigmatizing mental illness and accessing professional help" (Wei, et al., 2015, p. 2).

Methods: Data was collected using Indigenous Research Methodologies (IRM). IRM honors the "cultural protocols, values and beliefs of the Indigenous group" following "respect, reciprocity and relationality" (Weber-Pillwax, 1999, as cited in Steinhauer, 2001, p.73). Data was coded using content analysis and thematic analysis. Codes were combined into five themes according to their frequencies.

Results: The data indicated 102 code frequencies in Cree speaking building positive student relationships. Land-based learning with Elders and Equine Assisted Therapy (EAT) scored 78, while sports scored 58. Training mental health professionals from First Nation reserves for consistency of mental health services and funding scored 51. Healing circles for intergenerational grief scored 28.

Conclusion: Teachers improved student relationships by speaking Cree. Land-based learning with Elders built students' identity while EAT improved their social skills. Sports engaged parents, teachers, and students to collaborate. Localizing Indigenous Mental Health professionals, workshops, Indigenized resources and funding are needed for sustainability of students' mental wellness.

Funding: This research study is part of Dr. Yifeng Wei's research funded by the Canadian Institutes for Health Research (CIHR), four year project to collaborate with Indigenous communities across Canada to co-create an Indigenous Youth Mental Health Literacy Resource written by Indigenous youth, Elders, knowledge keepers and community members.

High Stress and Low Resilience Among Teachers in Three Canadian Provinces: Prevalence and Correlates

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Introduction: High-stress levels can be problematic for teachers and indirectly affect students. Knowledge about the prevalence and predictors of high-stress and low resilience will provide information about the extent of the problem among teachers in Canada.

Objective: To examine the prevalence and correlates of perceived stress and low resilience among Alberta, Nova Scotia, Newfoundland and Labrador teachers.

Methods: This is a cross-sectional study. Participants self-subscribed to the Wellness4Teachers text-messaging program and completed the online survey on enrollment. Data collection occurred from September 2022 to August 2023. Resilience and stress were respectively assessed using the Brief Resilience Scale (BRS) and the Perceived Stress Scale (PSS-10). Data was analyzed with SPSS version 28.

Results: A total of 1912 teachers subscribed to the Wellness4Teachers program, and 810 completed the baseline survey, yielding a response rate of 42.40%. The prevalence of high stress and low resilience were respectively 26.3%, and 40.1%. Participants with low resilience were 3.10 times more likely to experience high-stress symptoms than those with normal to high resilience (OR = 3.10; 95% CI: 2.18–4.41). Conversely, participants who reported high stress were 3.13 times more likely to have low resilience than those with low to moderate stress (OR = 3.13; 95% CI: 2.20–4.44).

Conclusion: Our study findings infer there's an incidence of high levels of stress and low resilience among teachers in the three Canadian provinces. Governments and policymakers in the education field should integrate stress management and resilience building strategies into teachers' ongoing professional development programs to help prevent and address high stress.

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Assessing the Acceptability and Efficacy of MIRA, a Virtual Assistant, in Providing Users with French Mental Health Resources

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Hypothesis: This Mental Health Virtual Assistant successfully brings users to appropriate and trustworthy mental health resources in French (e.g., mental health educational resources, online peer support, etc.).

Introduction: The leading cause of disability in Canada is mental health and addiction illnesses. Unfortunately, many significant gaps in care are present including a lack of support for those who are seeking mental health information, programs, and services for either themselves or loved ones. MIRA is a virtual assistant intended to aid in the navigation of the Canadian mental healthcare system.

Objectives: This study seeks to evaluate the use of artificial intelligence and machine learning, in the form of an informative, and supporting chatbot; MIRA - and its ability to support mental health care system navigation.

Methods: Data will be collected via focus groups, interviews, and chatbot data. Collected data will include demographic information, select items from the Embodied Conversational Agent (ECA) Trust Questionnaire (ETQ) and Acceptability E-scale (AES) will be used to assess user satisfaction and acceptability.

Outcomes: The primary outcome measure will be the analysis of user satisfaction and acceptability. Secondary outcome measures will be participant responses to chatbot effectiveness, such as whether the chatbot provided a perceived appropriate resource for the participant.

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From Embryo to Adult: Investigating the Developmental Impact of Nicotine in Zebrafish

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Introduction: Nicotine consumption is a prevalent phenomenon with far-reaching effects on individuals and their surroundings, potentially influencing development diversely across different life stages. While traditional cigarette use is declining, alternative forms such as vaping are gaining popularity. Zebrafish (Danio rerio) serves as an excellent model for studying the repercussions of early nicotine exposure and its intergenerational implications on physiology and addiction. Embryonic zebrafish offer numerous advantages as a research model, including transparency, rapid development, and large clutch sizes.

Objectives: In this study, we aim to investigate the impact of nicotine exposure at various life stages. Specifically, one group will involve breeding pairs exposed to nicotine for five days before breeding to mirror parental smoking habits preconception. Another group will experience nicotine exposure as embryos (at 5 days post-fertilization) to simulate fetal nicotine exposure, while the final group will be exposed to nicotine during their juvenile stage (at 3 months old), akin to teenage smoking habits.

Methods: Zebrafish will undergo testing at larval, juvenile, and adult stages to assess the effects of nicotine on locomotion, boldness, social behaviour, memory, and anxiety-like behaviour. Larval and juvenile testing will encompass measures such as spontaneous activity, dark pulse, habituation, and startle response. For adult fish, both open-field and novel object approaches will be employed.

Results: Anticipated results suggest that the nicotine-treated groups will exhibit more pronounced signs of anxiety during behavioural testing compared to non-nicotine-treated groups, with larval-exposed fish showing the most significant impact.

Conclusion: This model will help better understand the impact of early nicotine exposure and further the field of drug exposure using the zebrafish model. We also hope to utilize this model to understand the impact of other drugs.

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Identification of Predicting Factors for Nonspecific Psychological Distress in the General Population Using Machine Learning

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Introduction: Nonspecific psychological distress (NPD) is recognized as an important element affecting public health. However, the identification and prioritization of key factors related to NPD has not been adequately explored.

Objectives: The present study aims to identify top predictive factors associated with NPD by applying machine learning to the USA 2017 and 2018 National Health Interview Survey (NHIS) data.

Methods: NPD was assessed using the Kessler-6 scale. Using 7 as a cutoff, a score of 0 to 6 was considered none or mild NPD, and a score of 7-24 indicated moderate to serious NPD. The least absolute shrinkage and selection operator (LASSO) algorithm and bootstrapped random under-sampling were applied to identify moderate to serious NPD with 163 potential predicting variables from the 2017 and 2018 survey reports.

Results: Our model, trained using the 2017 NHIS dataset and tested using the 2018 NHIS dataset, reached a sensitivity of 76.9% and a specificity of 79.6% for identifying moderate to serious NPD. The top 10 potential risk and protective factors to identify moderate to serious NPD were as follows. Risk factors: Difficulty falling and staying asleep, financial worries, jaw or ear pain, and emergency department visits. Protective factors: waking up feeling rested, being over 50 years old, and being a parent of a child.

Conclusions: The present study selected and ranked the key factors linked to NPD, highlighting the key domains, notably sleep, that deserve priority attention for NPD prevention.

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Disease Specific Cognitive Age Gap: Evidence From the Canadian Longitudinal Study on Aging

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Introduction: While cognitive impairment can stem from different health conditions, the precise link between cognitive aging and diseases remains unclear. There is a lack of evidence to provide a comparable way to measure cognitive aging across different diseases.

Objective: This research aims to explore the relationship between cognitive aging and various diseases.

Methods: Our research leveraged comprehensive assessment data from 30,097 participants enrolled in the Canadian Longitudinal Study on Aging. We utilized machine learning algorithms to derive cognitive age based on cognitive data. The cognitive age gap, defined as the difference between cognitive age and chronological age, was then calculated. Subsequently, we conducted an analysis to reveal the association between the cognitive age gap and clinical disease variables.

Results: Our findings reveal a notable increase in the cognitive age gap across all clinical variables, with the exception of borderline diabetes or hyperglycemia. Specifically, cardio-cerebrovascular diseases demonstrated a substantial association with an increased cognitive age gap of 2.1 years. Similarly, Type II diabetes exhibited a significant rise of 1.3 years, while neurological diseases and related symptoms also contributed to an increase in the cognitive age gap ranging from 1.0 to 2.0 years. Mental health disorders were associated with an increase in cognitive age by up to 1.1 years.

Conclusion: This study underscores the impact of both physical and mental health conditions on cognitive aging. These insights could inform the development of novel interventions targeting cognitive decline and assist in prioritizing attention towards diseases with a more pronounced cognitive age gap.

Healthcare Service Access and Feasibility of Remote Health Monitoring in Emergency Department Patients

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Introduction: Emergency departments (ED) in Canada are strained; waiting rooms are overcrowded and clinicians are facing burnout. A possible solution is remote health monitoring (RHM), which is rapidly gaining research interest. RHM involves the use of technology, including mobile phone apps, wearable devices and smartwatches to obtain health data. Although remote health monitoring has clear benefits, such as a reduction in hospital readmissions, healthcare costs, and clinician burnout, it has not yet been widely implemented in the healthcare system.

Objectives: (1) To understand how individuals in the ED waiting room access healthcare services (2) To understand technology ownership among individuals in the ED waiting room and how they use technology in a health context (3) To compare findings between different gender identities and age categories.

Methods: Individuals in the ED waiting room at the Northeast Community Health Centre, Edmonton, Alberta, who were over 18 years of age and able to speak and understand English were offered participation in a brief survey with questions about how they access healthcare services and their technology use. Questions included demographic information (age category, sex, gender identity, and reason for ED visit), healthcare service access (811, family physician, internet, and devices) and technology use (smartphones and/or smartwatches). Questions were yes or no, multiple choice, and free text. Data analysis included calculating percent proportions and chi-square test to look at differences between gender and age categories.

Results: Our survey had 205 responses. Respondents primarily had a physical health concern (97%); 43% were between 18 and 40 years of age, 42% were between 41 and 64 years of age, and 15% were over 65 years of age. We obtained sex and gender information for a subset of the total sample (n=50). Of these participants, 46% identified as a man and 54% identified as a woman. Statistically significant differences between age categories were found for having a family physician, using the internet to look up symptoms, and smartphone and smartwatch ownership, but not for using 811 or devices, or using a smartphone and/or smartwatch to make health decisions. There were no significant differences between participants who identified as a man and a woman.

Conclusion: This feasibility study will provide insight into how ED patients access healthcare services and inform future research with the eventual goal of implementing remote health monitoring in the ED setting.

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Child and Youth Mental Health and Wellbeing Before and After Returning to In-Person Learning in Secondary Schools in the Context of COVID-19

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Background: As children reintegrate with in-person classroom learning after COVID-19, health and education institutions should remain mindful of students' mental health. There is a paucity of data on changes in students' mental health before, during and after their return to in-person classroom learning.

Methods: We collected and analyzed data on self-reported wellbeing, general mental health, perceived stress, and help-seeking attitudes from grade 7–12 students in a Catholic school division in Canada ($n = 258$ at baseline; $n = 132$ at follow-up). Outcomes were compared according to demographic differences such as gender, grade level, and experience accessing mental health services between baseline and follow-up. Effects of time points and each demographic variable on each outcome and the prediction of mental health were analyzed.

Results: No significant differences were apparent for outcomes between baseline and follow-up. However, specific subgroups: junior high students, male students, and students who had not accessed mental health services had better outcomes than their counterparts. From baseline to follow-up, male students reported mental health decline; students who had not accessed mental health services demonstrated greater stress, and students who did not specify a binary gender reported improved general mental health. At each time point, students indicated parents, guardians, and close friends as their most-preferred help-seeking sources. High stress predicted lower wellbeing at baseline, but higher wellbeing at follow-up.

Conclusion: Students presented stable mental health. Subgroups with decreased mental health may benefit from extra mental health support through building capacity among teachers and health care professionals to support students following public health emergencies.

Funding: This study was supported as part of the Women and Children's Health Research Institute Innovation Grant at the University of Alberta.

Impact of Mental Health and Substance Use Comorbidities on Hospitalization and Emergency Department Utilization in Persons with HIV: Administrative Data in Alberta, Canada

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Introduction: A few large-scale US-based and Canadian studies have shown that among persons with HIV (PWH), mental health and substance use comorbidities can increase the likelihood of emergency department (ED) and hospital visits. However, there is no information about the reasons for the increases in hospital-based healthcare utilization and the associated costs to the healthcare system. Reasons for those visits are needed to manage the healthcare costs in PWH with mental health/substance use comorbidities (PWH-MH). We hypothesized that PWH-MH will have increased rates of hospital-based treatment utilization compared to PWH without (PWH-only), which will result in higher costs. Reasons for higher healthcare utilization in PWH-MH will include but not be limited to acute mental health-related crises, e.g., suicide attempts.

Methods: Alberta Health Service data (practitioner claims) from April 1, 2002 to March 31, 2020 were consulted to identify PWH-MH and PWH-only. Hospital and ED utilization (discharge and ambulatory care records) were inspected over a three-year follow-up period with respect to visit frequency, duration, reasons, and costs.

Results: PWH-MH visited the ED or hospital (78%) more often than PWH-only (48%; $p<0.01$). This resulted in an average hospitalization cost of $58190 (98361) in PWH-MH compared to $35031 (64203) in PWH-only ($p<0.01$). Higher visit rates in PWH-MH compared to PWH-only included increased ED-visits for mental-health-related reasons (28% vs. 4%), physical conditions typically treated in ambulatory care (30% vs. 14%), physical trauma (45% vs. 19%) and medication complications (19% vs. 3%). ED admissions after acute mental-health crises due to self-harm or suicide attempts were rare but if observed, they only occurred in PWH-MH (2%).

Conclusion: Our outcomes highlight the significant burden of healthcare utilization and costs in PWH-MH compared to PWH-only. It emphasizes the need for targeted interventions to manage mental health/substance use comorbidities, potentially reducing healthcare utilization and associated costs among this population.

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Healthy Monitoring Using Smartwatches for Remote Workers: A Pilot Study

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Introduction: Fly-In-Fly-Out workers in Canada face challenges to their mental and physical well-being due to prolonged periods away from home in remote work camps. Wearable technologies, such as smartwatches, offer promising avenues for remote health monitoring, enabling early detection of health issues and reducing the need for in-person consultations. Our project is dedicated to integrating wearable device data into healthcare systems, by employing artificial intelligence and machine learning to tackle data interoperability challenges.

Objectives: The University of Alberta and Mood Disorder Society of Canada collaborated to demonstrate success based on the limited implementation of the Remote Health Monitoring Platform. We aim to investigate correlations between different smartwatch parameters and outcomes related to both mental and physical health.

Methods: Employing a mixed-methods research approach, we will conduct focus groups to explore end-users' health needs and a prospective remote monitoring cohort study. The cohort study will incorporate semi-structured interviews, surveys (PHQ-9, GAD-7, PSS), and elements of ecological momentary assessment. Mental and physical health measures obtained through surveys will be correlated with smartwatch parameters

Expected results: Machine learning and signal detection techniques will help us to identify associations between various smartwatch parameters and mental and physical health outcomes, enabling earlier detection of health issues and prediction of adverse health events based on individual thresholds.

Expected conclusion: By leveraging wearable technology, we expect to offer valuable insights into the mental health and well-being of FIFO workers, with the potential to inform broader organizational practices for managing employee health.

Funding: This work is supported by Mood Disorders Society of Canada.

Clinical Interventions for Trauma Related Dissociation

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Introduction: Dissociation is an evolutionarily preserved response ordinarily reserved for severe threat. Dissociation disrupts mental processes, impacting consciousness, memory, emotional processing, identity, perception, motor control, body awareness, and behavior. Trauma-related dissociation (TRD) occurs after the threat is over, in response to trauma cues. Despite its functional significance across multiple diagnostic categories, there remains limited recognition of and focus on dissociation in general psychiatry.

Objectives: This study aims to: 1) review empirical interventional studies reporting impact on dissociative symptoms; 2) report on research gaps and clinical implications, suggesting future research directions.

Methods: A systematic search included peer-reviewed interventional clinical studies enrolling adults that reported impact on functional dissociative symptoms, such as depersonalization and derealization. This review excluded identity dissociation, such as in dissociative identity disorder. Covidence software facilitated duplicate removal and article screening. Data extraction included population characteristics, study design, intervention specifics, and outcomes.

Results: From 4873 articles, 69 met inclusion criteria, involving 3710 predominantly female participants from Europe and the United States. Psychotherapy, especially trauma-focused psychotherapies, and cognitive behavioral and skills-based interventions reported promising results for addressing dissociation. Pharmacological interventions like selective serotonin reuptake inhibitors and atypical antipsychotics, and neuromodulation using repetitive Transcranial Magnetic Stimulation also yielded positive outcomes for depersonalization disorder.

Conclusion: TRD is an often-untreated clinical symptom cluster with functional impact. This review highlights the existence of multiple interventions that reduce dissociative symptoms. Continued research into underlying mechanisms and treatment efficacy may enhance outcomes for individuals with dissociative symptoms.

CALLM: Clinical Interview Data Augmentation with Large Language Model for Automated Mental Disorder Diagnosis Models

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Introduction: The global prevalence of mental health disorders is on the rise, imposing a significant economic burden estimated at trillions of dollars. To enhance diagnostic consistency and accuracy, researchers are increasingly exploring machine learning (ML) models for automated mental health diagnoses.

Objectives: The development of these models is hindered by the scarcity and imbalance of clinical data, a limitation that undermines ML model robustness and heightens the risk of overfitting. To address data shortage, our research introduces a novel clinical transcript data augmentation framework, leveraging large language models (CALLM).

Methods: This study proposes a 'Textbook-Assignment-Application' (T-A-A) partitioning approach for the systematic creation of synthetic clinical interview datasets. Additionally, we have devised a 'Response-Reason' prompt engineering technique to produce transcripts that are both highly authentic and rich in diagnostic value.

Results: Our synthetic dataset was tested on the widely used Extended Distress Analysis Interview Corpus for automated PTSD diagnosis. By utilizing our synthetic dataset, we were able to increase the training sample size by 100 times, resulting in a 25% improvement in accuracy for AI-based automated PTSD diagnosis tasks. Our synthetic dataset not only outperforms traditional data collection methods in terms of performance but also reduces the associated costs to less than 1%.

Conclusion: Our approach demonstrates high robustness and generalizability, offering a scalable solution to the data scarcity bottleneck in mental disorder diagnosis across various conditions.

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Somatosensory and Visual Cortical Hyperexcitability and Increased Resting-State Activity in Shank3B Mouse Model of Autism Spectrum Disorder.

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Introduction: Sensory processing abnormalities are a common feature in persons with autism spectrum disorder. The nature of these abnormalities is unclear but may contribute to core symptoms related to altered social interactions/communications and repetitive and restricted behaviours.

Objectives: Investigating cortical sensory activation alterations associated with peripheral sensory stimulation by using advanced in vivo optical functional neuroimaging approaches in a mouse model of autism disorder.

Methods: B6.129-Shank3<tm2Gfng>/J mice of three genotypes (Shank3B$^{+/+}$, Shank3B$^{+/-}$, Shank3B$^{-/-}$), 3-8 months old, were used as a model of ASD, with six mice per group. We administered AAV-Syn-jGCaMP8s PHP.eB to express a calcium sensor and recorded 15 minutes of spontaneous cortical activity. For sensory-evoked responses, whisker and visual stimulations were applied at various intensities over 20 trials each: whiskers at a 20 Hz frequency for 500ms and visual stimuli in a single 50ms pulse, to establish input-output curves.

Results: Spontaneous activity in Shank3B mutant mice globally increased, with Shank3B$^{-/-}$ exhibiting significantly greater activity compared to Shank3B$^{+/+}$. Input-output curves, reflecting whisker- (displacement: 0.1 mm-4 mm) and visual-evoked (20-360µW) responses, displayed hyperexcitability in Shank3B mutants in a dose-dependent manner. Specifically, for whisker stimulation at 1.6, 2.4, and 3.2 mm, and visual stimulation at 225 and 300µW, Shank3B$^{-/-}$ responses were significantly higher than both Shank3B$^{+/+}$ and Shank3B$^{+/-}$, indicating enhanced sensory reactivity. The greatest differences were observed at 3.2 mm for whisker and 300 µW for visual stimuli.

Conclusion: Our study has identified cortical hyperexcitability in both resting states and in sensory activation, suggesting complex sensory and neural alterations in ASD mouse models.

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Mono Therapy with Psilocybin Mitigates Behavioral Despair and Recognition Memory Impairments Through Bidirectional Modulation of the HPA-axis

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Introduction: There is a profound connection between social environment and mental health. Factors have been categorized into biological, psychological, and socio-environmental domains. However, existing animal models of depression often fail to capture this complexity. Several studies have underscored the importance of Hypothalamic regulation in regulating mood and cognitive functions under stress. In recent years, research efforts have raised questions about whether psilocybin can serve as a monotherapy and the mechanism behind it.

Objectives: 1) Compare the long-term beneficial effects of psilocybin in two distinct animal models of depression; 2) Investigate the underlying mechanisms influenced by psilocybin.

Methods: The study employed the biopsychosocial model and stress-induced model of depression. Series of behavioral tests have been conducted followed by postmortem analysis.

Results: Psilocybin (1.0mg/kg) notably increased the distance traveled and reduced immobility in stressed WIS rats but not in stressed WKY rats. The EPM showed no significant reductions in freezing time or time spent in the arms for both strains, yet risk assessment time was significantly reduced. In the FST, psilocybin reduced immobility and increased swimming and climbing in both strains. In the SPT, psilocybin elevated sucrose preference in stressed WIS rats. NOR suggested that psilocybin significantly enhanced recognition in both rat strains. Lastly, psilocybin significantly downregulated ACTH and corticosterone levels in stressed WIS rats but not in stressed WKY rats. In contrast, it upregulated TSH and melatonin levels in both rat strains.

Conclusion: Monotherapy with 1mg/kg psilocybin presents sustained beneficial effects on mitigating stress-induced through downregulating the HPA-axis while upregulating the HPT-axis. This study enhances our understanding of how psilocybin exerts antidepressant-like effects and offers insights into the development of depression treatment strategies by providing a biopsychosocial animal model of depression.

Neutrophil Mediates Peripheral Post-Recanalization Transcriptional Shifts: Identifying Underlying Functional Pathways and Regulatory Networks

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Introduction: Ischemic stroke (IS) is a well-recognized disease of aging that disproportionately affects men and the aged population, yet the age- and sex-dependent cellular mechanisms remain understudied in the literature. Emerging in-vivo animal studies support the role of neutrophil activation and stalls in the microvascular as a potential contributor to poor clinical outcomes. However, studies on this genomics part of this topic remain inadequate.

Objectives: Using the murine middle cerebral occlusion (MCAO) model that mimics a vessel occlusion with recanalization, we performed a comprehensive microarray analysis of blood samples post-IS in male, female, young adult, and aged mice.

Methods: Blood samples collected from sham, 1-hour MCAO, and MCAO with 3-hour recovery post-recanalization (N=44), were examined. Total RNA was extracted from blood samples and analyzed using Affymetrix Clariom™ S Assay. Downstream bioinformatics analysis was then performed in RStudio and Bioconductor.

Results: We identified 19 new gene markers of ischemic and recanalization injury. Our analyses revealed neutrophils and neutrophil signaling pathways to be the main differential driver of transcriptional changes in female and, to a lesser degree, aged animals. We identified mmu-mir-362-5p and mmu-mir-129-5p as the top regulatory miRNAs in male and aged recanalization animals, respectively. In females, mmu-mir-466i-5p, mmu-mir-466k, mmu-mir-466l-5p, and mmu-mir-466d-5p seem to regulate recanalization transcriptional responses, while mmu-mir-3470b, mmu-mir-329-3p, mmu-mir-15a-5p, and mmu-mir-17-5p do in young animals. Several age- and sex-specific transcription factors were also identified.

Conclusion: Responses to recanalization in peripheral blood is driven by the upregulation of neutrophil markers and their activation in female and aged animals. We determined key gene markers, regulatory miRNAs, and transcription factors that might account for early ischemic transcriptional responses and poor outcomes. The results in this study will be validated in an independent cohort using qRT-PCR.

Funding: This work was supported by CIHR.

Biological Sex and Gender Differences in Post Traumatic Stress Disorder (PTSD): A Literature Review

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Introduction: Post-traumatic stress disorder (PTSD) is a condition arising from traumatic experiences that lead to sustained neurobiological and physiological responses. In terms of biological sex at birth, women have been found to have an increased risk compared to men; the National Center for PTSD estimates that at least 10% of women will experience PTSD in their lifetime and at least 4% of men.

Objectives: This research aims to identify the key factors and implications for sex and gender differences in PTSD from military, veteran, and frontline worker populations.

Methods: A search was conducted in Medline to find relevant articles from 1980 until April 2024. The search combined the concepts of PTSD and factors related to sex or gender using relevant subject headings and multiple text word terms for each concept. Case studies and animal studies were removed.

Results: Evidence indicates that women with PTSD have a higher likelihood of experiencing dissociative symptoms, re-experiencing, anxious arousal, and acute subjective response symptoms such as threat perception and peritraumatic dissociation compared to men. In terms of biological sex and gender differences, risk factors for women developing PTSD include genetic predisposition, hormonal influence factors, and social factors such as gender roles.

Conclusion: PTSD is a debilitating, hard to treat condition, and it is important to explore areas of treatment that may have been neglected. Biological sex differences indicate that tailoring PTSD treatments or treatment delivery by individual cases in relation to biological sex may be important in optimizing health outcomes. This research aimed to look at the factors and implications for biological sex and gender differences in PTSD, but most of the studies found reported only on biological sex differences. More systematic analysis of the importance of gender identity is needed.

Effectiveness of Group Physical Exercise in Treating Major Depressive Disorder: An Analysis of Secondary Data from an Aborted Randomized Trial.

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Introduction: Depression is highly prevalent and a significant cause of mortality and morbidity across the globe. Although antidepressants and/or psychotherapy are often used to treat depression, some recent studies indicate that exercise may play an important role in lowering depression symptoms among patients meeting the clinical criteria of a depressive episode.

Objectives: This study aimed to assess the mental health and wellbeing of adult participants diagnosed with major depressive disorder (MDD) following a fourteen-week supervised physical exercise program.

Methods: In a pre-post design, the assessments were performed at baseline, seven weeks and fourteen weeks following the exercise intervention program using facilitated self-reported psychometric scales. Beck Depression Inventory (BDI-2) and Clinical Outcomes in Routine Evaluation - Outcome Measure (CORE-OM) were used to assess depression. The short form of the International Physical Activity Questionnaire (IPAQ) was used for self-reporting participants' physical activity.

Results: At the beginning of the study, the baseline total mean scores and standard deviations for the BDI-2, CORE-OM, and IPAQ in both genders did not differ significantly (p-value>.05). Patients showed significant improvement in all assessment scales after completing fourteen weeks of physical exercise program. Based on the BDI-2, the baseline score dropped from 31.25 (indicating moderate to severe depression) to 14.25 (indicating mild to minimal depression), with *a p*-value of <.001. The CORE-OM total mean score was reduced from 1.91 to 0.98 with a significant *p*-value < .005 indicating effective clinical improvement in depression symptoms. The IPAQ total MET-minutes/week mean score increased from 1713.22 to 4367.62, indicating an improvement in the participants' weekly P.E. intake; however, the change was not statistically significant *(p* =.07).

Conclusions: Sustained exercise interventions exhibit substantial therapeutic benefits for individuals with MDD, with notable reductions in depression severity over the fourteen-week period. These findings underscore the potential of exercise as an adjunctive therapy in depression management, offering valuable insights for primary care physicians and psychiatrists.

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Decolonizing Clinical Documentation and Related Language Praxis: Chart as Co-Created Narrative Guide (Study Protocol)

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Introduction: Current Western mental health practices, which systemize racism and inequity within the very structures and systems proclaimed to be helping people, particularly impact Indigenous people negatively. Recognizing the power of discursive practices in constructing "reality," there is a need to examine how language in narrative chart notes contributes to perpetuating biased assessments of Indigenous people. This study aims to develop culturally safe, trauma-informed, and anti-racist mental health approaches for Indigenous populations residing in the NWT's Beaufort Delta Region (BDR). Objectives include raising awareness regarding the influence of language on patients during mental health interactions and creating mental health documentation guidelines for the BDR.

Methods: Approved by the UofA Health Research Ethics Board, Indigenous Research Methodologies, arts-based research, participatory, and ethnographic/autoethnographic methods are employed. Critical discursive analysis of clinical documentation (de-identified/anonymized retrospective chart notes) will guide the research, along with feedback from a Community Advisory Committee (CAC). Acquisition of a research license and ethics approval from the GNWT has been submitted and is currently pending.

Results: A culturally safe, anti-racist mental health language guide and implementation toolkit will be co-created in collaboration with respected community members who value relationality, traditional ways of knowing, and healing together. Copies will be disseminated to all stakeholders, and community presentations will be made through Aurora College in Inuvik and community sharing within the Health Authority.

Conclusion: It is anticipated that prioritizing intentionality and unlearning outdated Western-colonial jargon will foster greater relational responsiveness between patients and providers, benefiting all involved.

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Investigating Sex Differences in Cytokine Release when Microglia Cultures are Treated with Varying Concentrations of Fructose

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Background: Microglia are the resident immune cells of the central nervous system (CNS). They are responsible for coordinating the inflammatory response by recruiting cells and releasing cytokines. Fructose has rapidly become an integral part of the human diet. However, high fructose diets have been associated with the development of several pathologies such as fatty liver disease, obesity, and diabetes. Additionally, high fructose diets have been associated with increased risk of developing psychiatric disorders such as depression. Increased levels of fructose have been suggested to increase the pro-inflammatory response. Male and female humans display profound sex-dependent differences in most aspects of functioning such as metabolism, physical development, and disease symptomatology. However, sex differences have been largely understudied, especially in terms of microglia activation.

Objective: The study aims to investigate how sex-dependent differences may influence microglia activation when exposed to varying concentrations of fructose.

Methods: We isolated primary microglia from the brains of postnatal day 2 rat pups, both male and female. Using the primary cell cultures, we conducted a 24-hour fructose test in which we exposed the cells to three different concentrations of fructose (0mM, 0.5mM, 5.5mM) and one glucose condition (17.5mM). We also delivered two different types of pro-inflammatory stimuli to the cell cultures, lipopolysaccharide (LPS) and interferon-gamma (IFNγ). We performed an ELISA to assess the activity of microglia via the release of pro-inflammatory cytokines – interleukin 6 (IL6), interleukin 1 beta (IL1β), and TNF (tumor necrosis factor). We also examined the release of the anti-inflammatory cytokine, interleukin 10 (IL10).

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Canadian Mental Health Association (CMHA)