ABSTRACTS

Research Day, November 4, 2020

Department of Psychiatry, Faculty of Medicine, uOttawa

Agenda

Time	Sessions	Duration
9:00 am - 9:10 am	**Opening Remarks** *Dr. Kathleen Pajer & Dr. Simon Hatcher*	10 minutes
9:10 am - 9:55 am	Keynote Presentation **Beyond telehealth: Advances in digital mental health research and practical clinical considerations for smartphone apps in care** *Dr. John Torous*	45 Minutes
9:55 am - 10:30 am	**A panel discussion: Virtual care in psychiatry** *Dr. John Torous, Dr. Synthia Guimond, Dr. Raj Bhatla, Dr. Simon Hatcher*	35 Minutes
10:30 am - 10:50 am	**How the COVID-19 pandemic changed the way Canadians sleep: Associated changes in symptoms of stress, anxiety and depression** *Karianne Dion*	20 Minutes
10:50 am - 11:10 am	**New psychiatric symptoms and worsening of pre-existing mental disorders during the COVID-19 pandemic** *Meggan Porteous*	20 Minutes
11:10 am - 11:30 am	**What is the link between pandemics and suicide? A systematic review** *Dr. Simon Hatcher*	20 Minutes
11:30 am -1:00 pm	**Poster and Lunch Break**	90 Minutes
1:00 pm - 1:20 pm	**An epigenome wide association study for biomarkers in suicide risk prediction** *Dr. Thanh Nguyen*	20 Minutes
1:20 pm - 1:40 pm	**Moderators of the association between depressive, manic, and mixed mood symptoms and suicidal ideation and behavior: An analysis of the National Network of Depression Centers Mood Outcomes Program** *Dr. Jess G. Fiedorowicz*	20 Minutes
1:40 pm - 2:00 pm	**Novel white matter imaging approach for the study of depression and suicide** *Katie Vandeloo*	20 Minutes
2:00 pm - 2:20 pm	**Management of alcohol withdrawal syndrome in co-occurring disorders: A clinically-focused narrative review** *Dr. Francis Côté*	20 Minutes
2:20 pm - 2:40 pm	**A naturalistic trial comparing the efficacy of uni-and bi-lateral theta burst stimulation in treating major depression, a study protocol** *Abir Gebara*	20 Minutes
2:40 pm - 3:00 pm	**Exploring the effects of repeated ketamine infusions on inflammation in patients with treatment-resistant depression** *Amanda Van Geel*	20 Minutes
3:00 pm - 3:30 pm	**Awards & Closing Remarks** *Dr. Kathleen Pajer & Dr. Simon Hatcher*	30 minutes

Oral Abstracts

1. HOW THE COVID-19 PANDEMIC CHANGED THE WAY CANADIANS SLEEP: ASSOCIATED CHANGES IN SYMPTOMS OF STRESS, ANXIETY AND DEPRESSION

Rebecca Robillard,[1,2] Karianne Dion,[1,2] Marie-Helene Pennestri,[3,4] Elizaveta Solomonova,[5] Elliott Lee,[1] Mysa Saad,[1] Anthony Murkar,[1] Roger Godbout,[4] Jodi D. Edwards,[6] Lena Quilty,[7,8] Alexander R. Daros,[7] Raj Bhatla,[10,11] Tetyana Kendzerska[9]

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Abstract:

Background: The COVID-19 pandemic increased global stress levels and drastically changed daily living, two important factors known to influence sleep. Since altered sleep can negatively impact mental health, there is a need to better understand the range of changes in sleep emerging during the pandemic. This study aimed to evaluate changes in sleep during the COVID-19 outbreak and to identify distinct profiles of changes in sleep-related behaviours. Demographic, behavioural and psychological factors associated with these sleep changes were investigated.

Methods: An online survey assessing sleep and mental health was distributed between April 3rd and June 24th, 2020. Retrospective questions were used to measure perceived temporal changes from before to during the outbreak.

Results: In 5,525 Canadian respondents (67.1% females, 16-95 years of age: Mean±SD = 55.6±16.3), occurrences of clinically meaningful sleep difficulties increased from 36.0% (n=1,988) before the outbreak to 50.5% (n=2,750) during the outbreak. Three subgroups with distinct profiles of changes in sleep behaviours were identified: 'Reduced Time in Bed', 'Delayed Sleep', and 'Extended Time in Bed'. The 'Reduced Time in Bed' and 'Delayed Sleep' subgroups had more adverse sleep outcomes and worsening in stress, anxiety and depressive symptoms during the outbreak. The emergence of new sleep difficulties was independently associated with female sex, chronic illnesses, being employed, family responsibilities, earlier wake-up times, higher stress levels, heavier alcohol use and higher television exposure.

Conclusions: A concerning number of individuals faced serious sleep challenges during the COVID-19 pandemic. Distinct profiles of changes in sleep-related behaviors were identified and found to be associated with different sleep and psychological outcomes. The heterogeneity of

sleep changes in response to the pandemic highlights the need for tailored interventions targeting sleep. Such interventions are likely to have downstream positive impacts on mental health.

Keywords: Sleep; COVID-19; Mental health

Learning objectives:
1. Differentiate subgroups of individuals with consistent sleep behaviour changes
2. Understand how these behavioral changes relate to changes in sleep outcomes and psychological response to the pandemic.
3. Recognize the various independent factors associated with the emergence of new sleep difficulties during the COVID-19 pandemic.

2. NEW PSYCHIATRIC SYMPTOMS AND WORSENING OF PRE-EXISTING MENTAL DISORDERS DURING THE COVID-19 PANDEMIC

Meggan Porteous[1,2]; Alexander R. Daros[3]; Jennifer L. Phillips[1,4]; Mysa Saad[1]; Marie-Helene Pennestri[5,6]; Tetyana Kendzerska[7], Jodi D. Edwards[8]; Elizaveta Solomonova[9] , Raj Bhatla[4,10]; Roger Godbout[6]; Zachary Kaminsky[1]; Addo Boafo[11]; Lena C. Quilty[3,12]; Rebecca Robillard[1,2]

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Abstract:
Background: The COVID-19 pandemic has caused global disturbances with serious psychological repercussions. This study investigated the psychological impact related to changes caused by the pandemic on individuals with and without mental disorders. It also assessed factors associated to psychological worsening, and changes in the use of psychological services during the COVID-19 pandemic.
Methods: An internet-based survey was circulated between April 3 and June 23, 2020. Respondents were asked to complete mental health questionnaires based on two time points:

currently (i.e. during the outbreak) and retrospectively (i.e. in the month preceding the outbreak). A total of 4,294 Canadians between 16 and 99 years of age were divided based on the presence of self-reported psychiatric diagnoses.

Results: The proportion of respondents without prior psychiatric history who screened positive for anxiety disorder and depression increased by 12% (GAD-7; $p<.001$, Cohen's g = .25) and 29% (QIDS-SR16; $p<.001$, Cohen's g = .41) respectively during the outbreak. Rates of clinically important worsening in anxiety, depression and suicidal ideation symptoms relative to pre-outbreak estimates were significantly higher in those with psychiatric diagnoses (GAD-7: 22.7%; $X2(1) = 87.7$, $p<.001$, V=.16, QIDS-SR16: 42.5%; $X2(1)=66.4$, $p<.001$, V=.14, suicidal ideation: $X2(1) =177.2$, $p<.001$, V=.23). 15-19% of respondents reported increased alcohol or cannabis use. Worse psychological changes relative to pre-outbreak estimates were notably associated with female sex, younger age, lower income, poorer coping skills, multiple psychiatric comorbidities, previous trauma exposure, deteriorating physical health, poorer family relationships, and lower exercising. The reduction in mental health care was associated with increased suicidality ($X2 (1)=8.8$, p=.003, V=.12).

Conclusion: The overall worsening in mental health symptoms and the decline in access to care require the urgent development of adapted interventions targeting both new mental disorders and pre-existing psychiatric conditions affected by the COVID-19 pandemic.

Keywords: COVID-19, mental health, healthcare services

Learning Objectives:
1. To explore how depressive and anxiety symptoms are changing as the pandemic progresses.
2. To describe how individuals with pre-existing mental health concerns are experiencing a greater decline of their wellbeing due to COVID-19.
3. To understand how access to mental health services has been affected by the pandemic for individuals with pre-existing mental health concerns.

3. WHAT IS THE LINK BETWEEN PANDEMICS AND SUICIDE? A SYSTEMATIC REVIEW

Simon Hatcher

The Ottawa Hospital Research Institute

Abstract:
Background: Infectious disease-related public health emergencies (epidemics) may increase suicide risk, and high-quality evidence is needed to guide an international response. Aims: We investigated the potential impacts of epidemics on suicide-related outcomes.
Method: We searched MEDLINE, EMBASE, PsycInfo, CINAHL, Scopus, Web of Science, PsyArXiv, medRxiv, and bioRxiv from inception to May 13–16, 2020. Inclusion criteria: primary studies, reviews, and meta-analyses; reporting the impact of epidemics; with a primary outcome of suicide, suicidal behavior, suicidal ideation, and/or self-harm. Exclusion criteria: not

concerned with suicide-related outcomes; not suitable for data extraction. PROSPERO registration: #CRD42020187013.

Results: Eight primary papers were included, examining the effects of five epidemics on suicide-related outcomes. There was evidence of increased suicide rates among older adults during SARS and in the year following the epidemic (possibly motivated by social disconnectedness, fears of virus infection, and concern about burdening others) and associations between SARS/Ebola exposure and increased suicide attempts. A preprint study reported associations between COVID-19 distress and past-month suicidal ideation. Limitations: Few studies have investigated the topic; these are of relatively low methodological quality.

Conclusion: Findings support an association between previous epidemics and increased risk of suicide-related outcomes. Research is needed to investigate the impact of COVID-19 on suicide outcomes.

Keywords: COVID; Suicide; systematic review

Learning Objectives:
1. To describe the link between pandemics and suicide
2. To identify groups at high risk of suicide potentially due to COVID
3. To identify potential mechanisms for the link between pandemics and suicide

4. AN EPIGENOME WIDE ASSOCIATION STUDY FOR BIOMARKERS IN SUICIDE RISK PREDICTION

Thanh Nguyen,[1] Zachary Kaminsky[2]

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Abstract:
Background: Suicide remains one of the leading causes of death worldwide. Current safety assessments rely heavily on patient self-report and the skills of the professional which can lead to significant variation in outcomes between assessors. This study aims to find candidates for accessible biomarkers that can give objective risk prediction and help standardize outcomes.
Methods: 539 subjects were asked to fill surveys characterizing several aspects of themselves including demographics, DSM diagnoses, substance use history, trauma history and suicidal behavior. Peripheral blood samples were drawn from these subjects and DNA extracted from this. Microarrays were run to survey 835,928 DNA methylation sites for any differences in methylation levels between subjects with suicidal ideation or suicide attempts. The statistical program R was used to analyze for any significant differences based on $p < 0.05$. Candidate sites that were found to be significant were then mapped on to the genome using NCBI to find a corresponding gene. The procedures were then repeated on a second data set containing microarray data of 391 subjects from another lab to replicate the gene associations.
Results: Three candidate genes were identified with significant changes in methylation levels. Increased methylation in COL11A2 and LYPD5 were observed in those with suicidal ideation within the past 30 days. Decreased methylation was observed in FAM59A for subjects who had a

suicide attempt within the past 30 days. There were no significant genes identified when comparing subjects with either lifetime suicidal ideation or lifetime suicide attempts (outside the past 30 days) to those without suicidal behaviour.

Conclusions: Three genes were identified with altered levels of expression in those with increased suicidal behavior. Future work should aim to replicate this association in larger datasets and to design experiments to establish causation to further develop their potential as suicide biomarkers.

Keywords: suicide, epigenetics, biomarkers

Learning Objectives:
1. Understand the difference between genetics and epigenetics.
2. Discuss potential ways certain genes may impact suicidal behaviour.
3. Appreciate the limitations of an association study.

5. MODERATORS OF THE ASSOCIATION BETWEEN DEPRESSIVE, MANIC, AND MIXED MOOD SYMPTOMS AND SUICIDAL IDEATION AND BEHAVIOR: AN ANALYSIS OF THE NATIONAL NETWORK OF DEPRESSION CENTERS MOOD OUTCOMES PROGRAM

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Abstract:
BACKGROUND: It has not been established that suicide risk with mixed symptoms is any greater than the depressive component or if there is synergy between depressive and manic symptoms in conveying suicide risk.
METHODS: The National Network of Depression Centers Mood Outcomes Program collected data from measurement-based care for 17,179 visits from 6,105 unique individuals with clinically diagnosed mood disorders (998 bipolar disorder, 5,117 major depression). The Patient Health Questionaire-8 (PHQ-8) captured depressive symptoms and the Altman Self-Rating Mania scale (ASRM) measured hypomanic/manic symptoms. Generalized linear mixed models

assessed associations between depressive symptoms, manic symptoms, and their interaction (to test for synergistic effects of mixed symptoms) on the primary outcome of suicidal ideation or behavior (secondarily suicidal behavior only) from the Columbia-Suicide Severity Rating Scale (C-SSRS). Moderation was assessed.

RESULTS: PHQ-8 scores were strongly associated with suicide-related outcomes across diagnoses. ASRM scores showed no association with suicidal ideation/behavior in bipolar disorder and an inverse association in major depression. There was no evidence of synergy between depressive and manic symptoms. There was no moderation by sex, race, or mood disorder polarity. Those over 55 years of age showed a protective effect of manic symptoms, which was lost when depressive symptoms were also present (mixed symptoms).

DISCUSSION: Mixed depressive and manic symptoms convey no excess risk of suicidal ideation or behavior beyond the risk conveyed by the depressive symptoms alone. Depressive symptoms are strongly linked to suicidal ideation and suicidal behavior and represent an important and potentially modifiable risk factor for suicide.

Keywords: Mood disorders; mixed states; suicides

Learning Objectives:
1. To recognize varied presentations of mood syndromes,
2. To appreciate current evidence for the role of mixed states in suicide risk,
3. To value the critical importance of depressive syndromes, a potentially modifiable risk factor, as the primary syndromal driver of suicide risk in mood disorders.

6. NOVEL WHITE MATTER IMAGING APPROACH FOR THE STUDY OF DEPRESSION AND SUICIDE

Katie L. Vandeloo[1,2], Tanisse Teale[1,3], Sylvain Bouix[2], Pierre Blier[1,4], Jennifer L. Phillips[1,3,4]

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Abstract:
Background: The prevalence and impact of suicide in depression is of significant global concern, and prevention efforts are limited by our incomplete understanding of its biological basis. Diffusion tensor imaging (DTI) is a neuroimaging technique that enables the study of tissue microstructure within white matter tracts in the brain thought to facilitate communication. However, extracted diffusion metrics may be biased by partial volume effects of extracellular free water. Application of novel free water imaging correction pipelines circumvent this issue, providing a more accurate and precise measure of white matter microstructure in regions relevant to depression and suicide. According to the literature, pro-inflammatory states have been shown to precede the onset of suicidal thoughts and behaviours. In line with this, free water imaging allows for the extraction of metrics which may be used as a proxy of neuroinflammation as well.

Methods: DTI data has been obtained from N=41 individuals (N=31 with treatment-resistant depression (TRD); N=10 healthy volunteers) to date. Measures of suicidal ideation and depression severity are being examined alongside white matter data obtained through whole-brain tract-based spatial statistics (TBSS), free-water imaging, and peripheral plasma inflammatory markers.

Results: Traditional DTI analyses have revealed decreased white matter microstructure (fractional anisotropy) in the hippocampal projection of the cingulum bundle in TRD patients with a history of suicide attempt compared to patients with suicidal ideation ($p<0.001$). Free-water imaging correction is expected to produce a more accurate measure of fractional anisotropy, and neuroinflammation is hypothesized to correlate with peripheral inflammatory markers.

Conclusions: This project will be the first to apply free water imaging, a novel neuroimaging technique, to the study of white matter and neuroinflammation in the context of depression and suicide. This research will provide crucial insight into biological correlates of psychiatric disease, which may inform future studies with further clinical implications.

Keywords: Suicide, Diffusion Tensor Imaging, Free-Water Imaging

Learning Objectives:
1. To identify the potential role of inflammation in depression and suicide.
2. To recognize the impact of depression and suicide on white matter microstructure.
3. To understand the role of free-water imaging as a proxy of neuroinflammation.

7. MANAGEMENT OF ALCOHOL WITHDRAWAL SYNDROME IN CO-OCCURRING DISORDERS: A CLINICALLY-FOCUSED NARRATIVE REVIEW

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Abstract:
Alcohol Use Disorder (AUD) is a common concurrent problem seen in the Psychiatric Emergency Services (PES). Abrupt alcohol cessation can lead to a potentially lethal Alcohol Withdrawal Syndrome (AWS). Psychiatrists must be competent in managing AWS safely and effectively in their clinical population. There are no treatment guidelines for the management of AWS in the Co-Occurring Disorder (COD) population. This contributes to practice variability. Key areas of clinical significance include choice of investigations, pharmacotherapy and treatment-setting. The main objective of this clinically-focused narrative review was to summarize relevant information for the management of AWS in COD patients. More specifically, we discuss the potential symptom overlap between AWS and psychiatric co-morbidities. Treatment setting selection is paramount for favorable outcomes. We list investigations helpful in stratifying the risk of severe complications. We discuss the essential criteria for safe outpatient management. Benzodiazepines are the cornerstone of pharmacotherapy in AWS. Strategies to determine the posology are reviewed. We compare the

risks and benefits of using specific benzodiazepine protocols (including fixed-dose, front-loading and symptom-triggered regimens) in the COD population. The role of anticonvulsants, antipsychotics, vitamins supplementation and other medications are also briefly discussed. In summary, this review assists clinicians in making evidence-based decisions for adult psychiatric patients with AWS in PES.

Keywords: Alcohol Withdrawal Syndrome (AWS), Co-Occurring Disorders (COD), Psychiatric Emergency Services (PES)

Learning Objectives:
1. Identifying the overlap between Alcohol-Withdrawal Syndrome and co-morbid psychiatric conditions.
2. Choosing the appropriate treatment setting in patients with Co-Occurring Disorders.
3. Selecting the appropriate pharmacotherapy for Alcohol-Withdrawal Syndrome and its complications in the presence of Co-Occurring Disorders.

8. A NATURALISTIC TRIAL COMPARING THE EFFICACY OF UNI-AND BI-LATERAL THETA BURST STIMULATION IN TREATING MAJOR DEPRESSION, A STUDY PROTOCOL

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Abstract:
Background: Five percent of Canadians struggle with major depressive disorder (MDD). Of these, a third find their initial antidepressant pharmacotherapy ineffective. Research into novel MDD treatments and the neurobiological mechanisms of action are therefore crucial. Recent technical advancements in repetitive transcranial magnetic stimulation treatments, has led to theta burst stimulation (TBS). TBS is a promising treatment for MDD that allows a 15-fold reduction in duration of daily sessions, whilst retaining clinical efficacy. It still remains to be determined if TBS is more efficient when applied to one or both prefrontal hemispheres (i.e. unilateral or bilateral TBS). Furthermore, maintenance has never been explored with TBS. Methods: Over the course of four years, this study aims to recruit 256 participants, for a randomized, double-blinded, naturalistic, superiority trial, comparing bilateral and unilateral TBS in participants with a primary diagnosis of depressive episode. TBS treatment will be administered 5 days/week over 6 weeks (30 sessions). Unilateral condition will consist of intermittent TBS (iTBS) applied over the left dorsolateral prefrontal cortex (DLPFC) followed by sham continuous TBS (cTBS) over the right DLPFC, while both iTBS and cTBS will be

active for the bilateral condition. If response or remission is achieved, participants will be randomized onto either a fixed or flexible 6-month maintenance phase. In addition, concurrent TMS and electroencephalography (TMS-EEG) recordings of the DLPFC will be performed before and after the first and last treatment session, to explore if prefrontal "plasticity" can predict therapeutic efficacy.

Results: Thus far, three participants have been enrolled in the study, of which two achieved remission and moved to the maintenance phase. The clinical trial was paused since March 2020 due to COVID-19.

Conclusion: This study will help elucidate neurobiological mechanisms of action and predictors of response to TBS. This project is crucial for the advancement of novel treatments for MDD.

Keywords: rTMS, electroencephalography (EEG), depression (MDD)

Learning Objectives:
1. To compare the efficacy of bilateral and unilateral TBS on symptoms of depression, as well as rates of remission and response.
2. To investigate how unilateral and bilateral TBS modulates brain activity in the DLPFC using interleaved TMS-EEG by measuring changes in levels of cortical inhibition and excitation.
3. To compare the efficacy of a fixed versus a flexible schedule of maintenance on a period of 6 months on symptoms of depression and rate of relapse.

9. EXPLORING THE EFFECTS OF REPEATED KETAMINE INFUSIONS ON INFLAMMATION IN PATIENTS WITH TREATMENT-RESISTANT DEPRESSION

Amanda Van Geel[1,2], Cécile Beaurepaire[1], Jon Villeneuve[1,2], Sandhaya Norris[1,3], Robyn McQuaid[1,2], Pierre Blier[1,3], & Jennifer L. Phillips[1,2,3]

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Abstract:
Background: Depression is a multi-faceted disorder associated with low-grade inflammation that often accompanies its clinical symptoms. Ketamine, a novel antidepressant strategy, has been shown to reduce depressive symptoms and suicidal ideation in a significant proportion of individuals with Major Depressive Disorder (MDD) but its effects on inflammatory processes remain unclear. The objective of this study was to use the peripheral pro-inflammatory marker, C-reactive protein (CRP), to examine the effects of repeated ketamine infusions on inflammation.

Methods: Plasma was collected from 43 participants with treatment-resistant depression (TRD) at baseline and after completion of an open-label trial of 6 thrice-weekly ketamine infusions. Treatment response was defined as a ≥50% reduction in depressive symptom severity using the Montgomery-Åsberg Depression Rating Scale (MADRS). Plasma CRP levels were measured using an enzyme-linked immunosorbent assay (ELISA).

Results: 59% of participants met antidepressant response criteria after repeated ketamine infusions. Mean baseline CRP levels were clinically elevated (mean=3.95±3.76 mg/L) and positively correlated with depression severity ($\rho=.528$, $p<.001$) and suicidal ideation severity ($\rho=.479$, $p=.001$). Additionally, baseline CRP was correlated with body mass index ($\rho=.499$,

p=.001), but not age (p=.59). Repeated ketamine infusions did not significantly change CRP levels (p=.821). Although, the difference between baseline and post-treatment CRP levels was positively correlated with change in suicidal ideation severity (ρ=.401, p=.013) but not change in depressive symptom severity (p=.879).

Conclusions: This study replicated previous findings that elevated inflammation is associated with increased depressive symptom severity and suicidal ideation severity. While repeated ketamine infusions reduced depression severity, there was no observed change in CRP levels with treatment. However, change in CRP was correlated with change in suicidal ideation severity indicating a potential relationship between CRP and ketamine's effects on suicidal ideation.

Keywords: ketamine, depression, biomarkers

Learning Objectives:
1. Describe the relationship between inflammation and the clinical presentation of depression
2. Understand the effects of repeated subanesthetic ketamine infusions on CRP and its relationship with depressive symptom severity and suicidal ideation severity
3. Discuss how the use of biological markers can aid in the understanding of depression and its treatment strategies

Poster Abstracts

1. EFFECTS OF A 12-WEEK AEROBIC EXERCISE INTERVENTION ON CLINICAL AND COGNITIVE SYMPTOMS OF DEPRESSION IN TRANSITIONAL-AGED YOUTH

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Abstract:
Background: The putative pro-cognitive and mood-elevating effects of exercise have become increasingly investigated in the adult population, though research in youth is in its infancy. Of particular interest are the potential effects of long-term aerobic exercise interventions on symptoms of depression, anxiety, self-esteem, and cognitive impairments in youth with depression.
Methods: As part of a larger pilot study, transitional aged youth (TAY; 16-24yrs), with depression were tested (N=14) to examine the effects of a 12-week (3x/week) exercise intervention on self- and researcher-rated depression; self-reported anxiety, daily functional impairment, self-esteem, and mastery scores; as well as cognitive performance. Electroencephalographic (EEG)-derived P3 and N2 event-related potentials (ERPs) were examined during a flanker task as measures of attention and inhibitory control, respectively. Baseline ERP measures (amplitude and latency) were correlated with clinical indices. The ERPs were also assessed in order to ensure task validity; wherein ERPs to incongruent trials versus congruent were expected to have greater amplitudes and latencies.
Results: A reduction from pre- to post-intervention scores of depression and functional impairment scores, as well as an increase in cognitive performance, were found. Positive correlations existed between congruent and incongruent P3 amplitudes and self-mastery scores. As hypothesized, incongruent versus congruent P3 amplitudes and latencies as well as N2 amplitudes were greater, indicating increased attention and inhibition during the processing of incongruent trials.
Conclusions: While preliminary, these results suggest that exercise intervention can increase cognition and reduce symptoms of depression in youth. Further research is necessary on the effects of exercise on ERPs in the context of depression.

Keywords: Depression, Exercise, Youth

Learning Objectives:
1. Viewers will have a better understanding of how depression in youth impacts cortical processing, measured via EEG.
2. Viewers will learn about the benefits of exercise on mood and symptoms of depression in youth.
3. Viewers will learn about the impact of exercise on event related potentials (ERPs) involved in cortical processing in youth with depression.

2. EXPLORING THE ASSOCIATIONS BETWEEN MARKERS OF AUTONOMIC AROUSAL, PSYCHOPHYSIOLOGICAL STRESS AND SLEEP IN THE CONTEXT OF PTSD

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Abstract:
Background: Post- traumatic stress disorder (PTSD) is triggered by a traumatic event and is notably characterized by an overreactive fear response, hyperarousal symptoms, and autonomic dysfunctions, with elevated skin conductance, blood pressure and heart rate. Physiological arousal has been found to alter sleep, which may consequently worsen daytime PTSD hyperarousal symptoms the next day. The objective of the present study was to further explore the putative bidirectional relationship between sleep disturbances in PTSD and the autonomic nervous system.
Methods: Twenty-three combat exposed veterans with PTSD (5 female; mean age + SD: 47.3 + 9.1 years) underwent psychiatric assessments, blood pressure measurements and a night of polysomnography. Mean skin conductance was measured over a 15-minute period in the morning at rest and during a stressful task. Partial correlations were performed between sleep architecture variables, blood pressure and skin conductance.
Results: Higher systolic blood pressure before bedtime correlated significantly with increased sleep onset latency, and higher amounts and percentage of REM sleep in the subsequent sleep episode. In the morning, higher skin conductance at rest correlated with longer sleep onset latency and lower percentage of NREM2 sleep from the previous sleep episode. More nighttime awakenings correlated with higher skin conductance during the task and higher task-related response in skin conductance.
Conclusions: These results suggest that elevated evening HR and BP may worsen sleep abnormalities typically linked to PTSD. Sleep abnormalities may then worsen PTSD hyperarousal symptoms the next day. This highlights the need to determine if interventions regulating autonomic arousal before bed could positively effect sleep, which may alleviate signs of physiological hyperarousal the next day.

Keywords: Sleep; PTSD; autonomic arousal

Learning Objectives:
1. Explore the association between sleep disturbances and the autonomic nervous system in PTSD.
2. Evaluate the temporal relationship between hyperarousal symptoms of PTSD and sleep.
3. Investigate the impact of sleep disturbances on markers of autonomic arousal and psychophysical stress the next day.

3. APPLYING THE THEORETICAL DOMAINS FRAMEWORK TO IDENTIFY POLICE, FIRE, AND PARAMEDIC PREFERENCES FOR ACCESSING MENTAL HEALTH IN A FIRST RESPONDER OPERATIONAL STRESS INJURY CLINIC: A QUALITATIVE STUDY

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Abstract:
Background: First responders are often exposed to repeated events with the potential to be psychologically traumatizing. Such exposures, when coupled with insufficient social supports and reduced healthcare-seeking behaviours, may contribute to increased risk for mental health challenges.
Objective: The current study used the Theoretical Domains Framework (TDF) to identify and better understand critical barriers and enablers of help-seeking and accessing mental health care in three first responder services in Ottawa (Police, Fire and Paramedic Services).
Methods: Semi-structured qualitative interviews of 24 first responders were used to identify critical barriers and facilitators to help-seeking and accessing mental health care. Initial participants were recruited using purposive sampling; thereafter, a snowball sampling technique was used to identify potential participants. Transcribed interviews were analyzed using deductive content analysis. The TDF was used to guide data collection and analysis.
Results: The most commonly reported barriers included difficulties with confidentiality, trust, cultural competency, and stigma. Key themes were classified into six of the TDF's theoretical domains: environmental context and resources; social influences; social/professional role and identity; knowledge; emotion; and beliefs about consequences. The results indicated that access to mental health care is primarily impacted by environmental context and availability of resources.
Conclusions: While a wide range of barriers and facilitators were identified to influence first responder help-seeking and access to mental health resources, environmental context and resources may be especially important. These results will be instrumental in the development of evidence-based approaches to encourage help-seeking and accessing mental health care among first responders. The results can also assist in the development of a model of care that is broadly applicable to other first responder services across Canada and other public safety sectors.

Further, the current study may also serve as a useful resource for first responder organizations to inform service development and delivery of existing services.

Learning Objectives:
1. Provide background information about the unique mental health needs of first responders.
2. Discuss the Theoretical Domains Framework, and its use to understand critical barriers and facilitators impacting help-seeking behaviour for mental health care in first responders.
3. Discuss the most common barriers and facilitators to first responders accessing healthcare.

4. AN EXAMINATION OF THE IMPACT OF THE COVID-19 PANDEMIC ON MEDICAL EDUCATION AND RESIDENT MENTAL HEALTH

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Abstract:
Background: While COVID-19 has spread across the globe many studies have shown that healthcare workers providing care during a viral outbreak are at risk of burnout, depression, and anxiety. Within Canada, rates of burnout, depression and suicidal ideation are higher among medical trainees than practicing physicians. Multiple studies have acknowledged that the COVID-19 outbreak has resulted in disruptions and challenges in the training of medical residents. The aim of this study is to explore the perceptions and experiences of medical trainees and educators who faced changes to medical training delivery during the COVID-19 pandemic and the perceived impact of the pandemic on medical resident mental health.
Methods: This cross-sectional study will use qualitative interviews and focus groups to collect data using the grounded theory framework, a qualitative methodology which involves sampling participants based on the continuous coding of received data and the emerging theory from initial analysis. Semi-structured phone interviews will be conducted in French or English with samples of residents drawn from the University of Ottawa Faculty of Medicine. In addition, 15-30 medical educators will be recruited to participate in focus groups looking at educator perceptions of the challenges and impact of COVID-19 on the delivery of medical education.
Expected results: Qualitative interviews with medical residents will explore the impact of the pandemic on medical education, future career plans, opinion of academic institution, life outside of medicine, and mental health. Focus groups with medical educators will discuss the challenges and priorities relating to resident education and efforts to minimize the impact of the pandemic on trainee wellness.
Conclusion: Results from this study are expected to improve understanding of the impact of the COVID-19 pandemic on medical resident education and mental health and guide preparation at personal, institutional, and policy levels for similar circumstances in the future.

Learning Objectives:
1.   Understand the potential impact of COVID-19 on medical resident mental health
2.   Consider the impact of COVID-19 on medical education and training opportunities
3.   Understand the methods to be used in this study

5. EVALUATION OF THE EFFECTIVENESS AND PERCEPTION OF LEVEL OF COMPETENCY ON THE MENTAL HEALTH ACT E-LEARNING MODULES IN A COHORT OF LEARNERS TRAINING IN PSYCHIATRY ROTATIONS

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Abstract:
Background: The last several decades have seen a shift from traditional teaching and learning towards the use of internet-based technologies to produce novel ways of delivering, accessing and assessing knowledge. With the advancement of technology and the internet, e-learning has made its way into medical education and has been used to improve educational interventions by performing already-existing tasks faster. This pilot study evaluated the effectiveness and the perception of level of competency based on data collected in a cohort of learners training in psychiatry rotations.
Methods: A knowledge pre-test was first administered to assess participants' baseline level of knowledge about the topic. Participants were then asked to complete a novel e-learning module of their competency level (blinded) in the Mental Health Act, developed specially for this study. The knowledge post-test was administered immediately following the e-learning module to reduce any confounding variables such as additional independent study after exposure to the e-learning module.
Results: 10 responses were obtained from all three competency levels combined. A paired t-test between the pre-test and post test scores was conducted, with p = 0.0386 (P<0.05). However, perception of competency correlation was poor at only 10% (1/10). Conclusions: This pilot study demonstrated that e-learning may be an effective educational approach for knowledge acquisition. It may be implemented as a useful tool in teaching in the virtual curriculum.

Keywords: Mental Health Act; E-Learning; Virtual Curriculum

Learning Objectives:
1.   E-learning history and development
2.   E-learning is an effective approach in knowledge acquisition
3.   Potential applications of e-learning into a virtual curriculum

6. IMPAIRED MISMATCH NEGATIVITY TO MULTIPLE DEVIANT TYPES ARE ASSOCIATED WITH DIFFERENT FEATURES OF AUDITORY VERBAL HALLUCINATIONS IN SCHIZOPHRENIA

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Abstract:
Background: Auditory verbal hallucinations (AVHs) are perceptions of speech or sounds in the absence of external corresponding auditory stimuli. AVHs are a key symptom of schizophrenia (SZ) that cause functional impairments and distress for patients. Despite treatment with antipsychotic medications, approximately 25% of SZ patients experience chronic and medication-resistant AVHs. Further research into the underlying neuronal mechanisms of AVHs is needed to develop alternative treatment options. The mismatch negativity (MMN) is an auditory event-related potential that represents pre-attentive detection of stimulus deviance. MMN deficits have been widely reported in SZ patients and are associated with greater AVH frequency. MMN deficits may be related to specific features of AVHs, which has yet to be extensively assessed.
Methods: Electroencephalographic (EEG) activity was recorded from 13 SZ patients with AVHs and 11 healthy controls (HCs). MMNs to five deviant types were elicited using the multi-feature optimal paradigm. SZ features and AVHs were assessed using the Positive and Negative Syndrome Scale, the Psychotic Symptom Rating Scale, the Voice Power Differential Scale (VPDS) and the Beliefs About Voices Questionnaire (BAVQ). Relations between these measures and MMN features were assessed.
Results: Compared to HCs, SZ patients had smaller MMN amplitudes for frequency ($p = <$ .001), gap ($p = .015$) and intensity deviants ($p = .023$). In SZ patients, smaller mean frontal MMN amplitudes were associated with higher scores on the VPDS for frequency ($p = .011$), intensity ($p = .001$) and location deviants ($p = .028$). Smaller mean frontal MMN amplitudes were also associated with higher scores on the malevolence subscale of the BAVQ for both gap deviants ($p = .025$) and intensity deviants ($p = .028$).
Conclusions: These preliminary results indicate that SZ patients show MMN deficits to multiple deviant types, and that different deviants are associated with different features of AVHs.

Key Words – Schizophrenia, Event-Related Potentials, Mental Health

Learning Objectives:
1. Learn about the mismatch negativity and schizophrenia.
2. Learn about the role of auditory verbal hallucinations
3. Learn about different auditory deviant types

7. INVESTIGATING ERP COMPONENTS OF EMOTIONAL PROCESSING DURING RESPONSE INHIBITION IN ADOLESCENT SUICIDE ATTEMPTERS

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Abstract:
Background: Among the many factors influencing adolescent suicide, difficulties with cognitive control may contribute to increased risk of future suicidal behaviour. This study assessed the neural correlates of cognitive inhibition during emotional processing in adolescents hospitalized for acute suicidal risk.

Methods: Event-related potentials (ERPs) were recorded during an emotional Go/NoGo task where 12 adolescents who attempted suicide (Mage = 15, SD = 1.5; 9 females) and 12 age- and sex-matched healthy controls (Mage = 14, SD = 1.2; 8 females) were required to respond to (Go trials), or withhold a response from (NoGo trials), faces showing happy, neutral and sad emotional states. To isolate the effects of inhibition (P3) from the Go and NoGo trials, difference waves (d = NoGo minus Go trials) were calculated, thus resulting in a P3d component.

Results: The suicidal group showed more negative P3d amplitudes in response to happy ($F_{(1,22)}$ = 10.8, p = .003, $\eta p2$ = .33) and neutral ($F_{(1,22)}$ = 9.3, p = .006, $\eta p2$ = .30) stimuli compared to the control group, with the right hemisphere showing further impairments (C4: p=.008) during positive stimuli presentation compared to the left hemisphere (C3: p=.049). Further analyses indicated that the suicidal group seemed to have a reversed pattern of P3 amplitude in response to inhibition, with lower amplitudes in the NoGo compared to the Go conditions (p=.002) when compared to the control group (p=.685).

Conclusion: These findings provide more insight into inhibition difficulties in adolescents with acute suicidal risk. Difficulties in emotional processing should be considered when treating acutely suicidal youths.

Keywords: inhibition, emotion, suicidality

Learning Objectives:
1. Adolescents with a history of suicide attempts have marked differences in neural processing compared to healthy adolescents on tasks requiring inhibition during emotional tasks.
2. Interventions should be tailored to address the emotional processing difficulties experienced by adolescents with previous suicide attempts and current suicide risk.
3. Further research is needed to explore the neural correlates of cognitive inhibition during emotional processing in adolescents with acute suicidal risk.

8. USING NEUROMELANIN-SENSITIVE MRI TO ESTABLISH THE ROLE OF DA IN CLASSICAL AVERSIVE CONDITIONING IN-VIVO

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Abstract:
The aberrant salience hypothesis posits that an overactive dopamine (DA) system leads to the inappropriate assignment of salience to irrelevant or neutral stimuli. This provides the basis for the emergence of positive symptoms in schizophrenia and psychotic disorders. However, evidence linking the DA system to salience attribution in humans is not well established. Classical aversive conditioning provides a method to study salience attribution by observing responses to the threatful positive conditioned stimulus (CS+) versus non-threatful negative conditioned stimulus (CS-) cue. Furthermore, an index of nigral DA system activity can be acquired by neuromelanin-sensitive magnetic resonance imaging (NM-MRI). Here, functional MRI (fMRI) and NM-MRI were employed during an aversive conditioning task to assess blood-oxygen-level-dependent (BOLD) responses to cues and nigral DA activity, respectively. As preclinical work suggests striatal DA is necessary for classical aversive conditioning, we hypothesize the nigral DA signal will be correlated with BOLD responses in the striatum. Twelve healthy participants were included in the preliminary analysis of 4 runs of aversive conditioning fMRI and NM-MRI. Voxel-wise mass-univariate analysis of the CS+/CS- BOLD contrast within the subcortex was employed to observe clusters related the nigral DA signal, controlling for age and biological sex. In the first run, nigral DA activity is positively associated with the left caudate CS+/CS- BOLD contrast. In the second and third runs, the relationship remains positive but weakens. In the fourth run, nigral DA activity is negatively associated with the left caudate CS+/CS- BOLD contrast. Overall, our preliminary results suggest 1) individuals with increased nigrostriatal DA activity exhibit faster acquisition to an initial aversive pairing and 2) these same individuals habituate to successive aversive pairings more quickly. Our forthcoming experiments will test whether this pattern of correlations remains in healthy individuals and deviates in those at clinical high risk for psychosis.

Keywords: Fear Conditioning, Dopamine, Psychosis

Learning Objectives:
1. Classical aversive conditioning provides a method to study salience attribution in animals and humans.
2. Neuromelanin-sensitive magnetic resonance imaging (NM-MRI) provides an index of dopamine function in the living human brain.
3. Our preliminary results suggest the NM-MRI signal is correlated with fMRI activity in the caudate nucleus during fear conditioning.

9. A MIXED-METHODS ANALYSIS OF EARLY SCHIZOPHRENIA PATIENTS' EXPERIENCES WITH COGNITIVE ENHANCEMENT THERAPY

Chelsea Noël[1], Feng Gu[1], Leighanne Ormston[2], Samantha Tingue[2], Alexandra Tucci[1,3], Patrizia Pezzoli[1], Shezal Padani[2], Luis Sandoval[2], Jessica A. Wojtalik[4], Shaun M. Eack[5], Matcheri S. Keshavan[2,6], Synthia Guimond[1,3,6-7]

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Abstract:
Background: Evidence shows that cognitive remediation therapy improves cognition in individuals with schizophrenia. However, its broader impact on patients' lives remains unclear. Furthermore, little is known about the motivational factors influencing treatment engagement. This quantitative and qualitative case series study identified factors that influence patients' experiences while receiving Cognitive Enhancement Therapy (CET).
Methods: Nine individuals with schizophrenia who received CET completed two questionnaires and participated in semi-structured focus groups or in an individual interview about their experience with CET. Four deductive themes were assessed when analyzing responses: 1) Perceived impact, 2) Motivational facilitators, 3) Motivational barriers, and 4) Suggestions to improve CET.
Results: All participants reported that CET was helpful, and the majority enjoyed participating in CET. Most participants reported high satisfaction with their work and school, but lower satisfaction with their social life. Results also indicated perceived improvements in negative symptoms, neurocognition, and confidence following CET. Participants identified extrinsic, intrinsic, and program-specific facilitators and barriers motivating their participation in the program. Suggestions to improve CET included changes to treatment design and content.
Conclusions: Altogether, these results indicate that the perspective of CET end users can provide useful information on the factors influencing treatment engagement, satisfaction, and perceived impact.

Keywords: Schizophrenia, Cognition, Cognitive remediation

Learning Objectives:
To identify factors related to:
1. Early schizophrenia patients' perceived impact of Cognitive Enhancement Therapy (CET)
2. Motivational facilitators and barriers to CET and
3. Suggestions to improve CET.

10. NEUROMELANIN-SENSITIVE MRI AS A PROBE TO MEASURE IN VIVO FUNCTIONING OF THE LOCUS COERULEUS NOREPINEPHRINE SYSTEM IN PTSD

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Abstract:
Background: The locus coeruleus-norepinephrine (LC-NE) system is an important neuromodulatory system in the human brain. Dysregulation of this system has been implicated in numerous disease states including mental illnesses such as depression and PTSD. Specifically, in previous research, hyperarousal symptoms commonly observed in PTSD have been linked to increased LC activity, thus, implicating this system in the pathophysiology of the disease. Here, utilizing a novel neuroimaging method known as neuromelanin-sensitive MRI (NM-MRI), we provide additional evidence for the role of the LC-NE system in mental illnesses, particularly PTSD and depression.

Methods: 24 veterans from the Canadian Armed Forces were recruited from the Operational Stress Injury Clinic at The Royal. 19 of these individuals met DSM-5 criteria for PTSD. Individuals underwent NM-MRI imaging procedures, as well as completed clinical assessments assessing both PTSD and depressive symptoms. Using a semi-automated method, NN-MRI was preprocessed and analyzed.

Results: Two correlations were observed with respect to the LC NM-MRI signal. First, there was a significant positive correlation between LC NM signal and hyperarousal symptomology ($r= 0.52$, $p= 0.02$, partial correlation controlling for depression severity, age, sex, and PTSD diagnosis). Secondly, we observed a negative correlation between the LC NM signal and depressive symptoms $r = -0.48$, $p = 0.033$, partial correlation controlling for PTSD diagnosis, hyperarousal severity, age and sex).

Conclusion: Our results are consistent with the current literature, demonstrating that LC dysregulation can be associated with symptoms of PTSD. These findings support the potential for NM-MRI to be used as a biomarker in PTSD treatment that could indicate personalized treatment with drugs targeting noradrenergic imbalance.

Keywords: Neuromelanin-MRI, PTSD, locus coeruleus-norepinephrine

Learning Objectives:
1. Further validate the use of NM-MRI in a clinical setting
2. Provide additional evidence to support the role of the LC-NE system dysregulation in mental illnesses such as PTSD and depression
3. Provide insights regarding potential biomarkers associated with PTSD including LC-NE system dysregulation

11. EXPLORING THE RELATIONSHIP BETWEEN PREFRONTAL CORTEX PLASTICITY, CORTICAL THICKNESS, AND MEMORY ABILITY USING A NEUROSTIMULATION AND NEUROIMAGING APPROACH

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Abstract:

Background: Brain plasticity refers to the brain's ability to modify neural circuitry and can be estimated using non-invasive brain stimulation and electrophysiological monitoring procedures. Brain plasticity mechanisms in regions like the dorsolateral prefrontal cortex (DLPFC) may underlie complex cognitive processes, such as memory. Also, cortical thickness in the DLPFC has been suggested as a potential proxy measure of brain plasticity. Altogether, the current study aims to examine the relationship between brain plasticity in the DLPFC, memory performance and cortical thickness.

Methods: Intermittent theta burst stimulation (iTBS) was used to probe plasticity-like mechanisms in the left DLPFC in six healthy participants. Concurrent transcranial magnetic stimulation and electroencephalography recordings were performed before and after iTBS to quantify plasticity via transcranial magnetic stimulation-evoked potentials (TEPs). A composite memory score was obtained using the Cambridge Neuropsychological Test Automated Battery. Anatomical T1 images were acquired using magnetic resonance imaging. Brain imaging data were pre-processed using the minc-bpipe-library pipeline (CoBrA Lab and G.A. Devenyi; Douglas Mental Health University Institute, Quebec, Canada) and processed using the open source CIVET software (v2.1.0; McConnell Brain Imaging Centre, Quebec, Canada). The relationship between left DLPFC plasticity to both memory performance and left DLPFC cortical thickness were analyzed using Pearson's correlations.

Results: We observed a trending significant relationship between an increase in P30 amplitude post-iTBS and greater memory performance (r=0.844 p=0.073). We also observed a significant relationship between an increase in P30 and N45 amplitudes post-iTBS, as well as trending significance for P60, to higher levels of cortical thickness in the left DLPFC (P30 (r=0.971, p=0.006), N45 (r=0.969, p=0.006) and P60 (r=0.848, p=0.069)).

Conclusion: These preliminary findings provide evidence for potential relationships between (1) left DLPFC plasticity and memory performance and (2) left DLPFC plasticity and left DLPFC cortical thickness. We plan to recruit an additional 15 participants.

Keywords: Neuroplasticity, memory, brain-morphology

Learning Objectives:
1. To investigate brain plasticity within the prefrontal cortex.
2. To explore the relationships between prefrontal cortical plasticity to both memory ability and prefrontal cortical grey matter thickness.

12. ADOLESCENT EATING DISORDERS AND THE IMPACT OF COVID-19

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Abstract:
This study describes a cohort of adolescents who were assessed in a pediatric eating disorder (ED) program following the onset of the COVID-19 pandemic. A secondary data analysis was conducted on the clinical charts of 23 patients assessed between March 15th and August 31st, 2020. On average, patients were 14.73 years of age (range = 10–17, SD = 2.08) and primarily female (87.0%). Patients reported various triggers for their EDs, including the pandemic (30.4%).

Keywords: eating disorders, adolescents, COVID-19

Learning Objectives:
1. To describe a cohort of adolescents assessed in a hospital-based pediatric eating disorders clinic following the onset of the COVID-19 pandemic.
2. To examine the triggers and stressors associated with adolescent eating disorders, including those in this cohort of adolescents, most of whom were diagnosed with anorexia nervosa.
3. To describe the impact of COVID-19 on this cohort of adolescents with severe eating disorders.

13. SUICIDALITY IN SOMATIC SYMPTOM AND RELATED DISORDERS: A SYSTEMATIC REVIEW

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Abstract:
Objective: We sought to determine the frequency of and risk factors for suicide outcomes in somatic symptom and related disorders and whether any risk was independent of co-occurring mental disorders.
Methods: We conducted a systematic review of studies on completed suicide, suicide attempts, and suicidal ideation in those with somatic symptom disorders published prior to September 22, 2020 and indexed in PubMED, MEDLINE, PsycARTICLES, PsycINFO, or EMBASE according to PRISMA guidelines.
Results: Our search yielded 33 articles with significant heterogeneity in study design, sample selection, and assessment for suicide or risk factors. While suicide deaths have not been adequately studied, somatic symptom and related disorders are associated with increased risk for

suicidal ideation and suicide attempts, with estimates ranging from 24-34% of participants who endorsed current active suicidal ideation and 13-67% of participants who endorsed a prior suicide attempt. The risk appeared independent of co-occurring mental disorders. Identified risk factors for suicide attempts in samples with somatic symptom and related disorders include scores on measures of anger, alexithymia, alcohol use, past hospitalizations, dissociation, and emotional abuse.

Conclusion: Although the literature is sparse, there exists evidence for an association, even independent of other mental disorders, between somatic symptom and related disorders and suicide outcomes. Practice guidelines for the management of these disorders should incorporate recommendations for the assessment and management of suicide risk. Future study is necessary to more fully elucidate potential unique risk factors for those suffering from these complex disorders.

Keywords: Somatic symptom disorders; Suicide; hypochondriasis

Learning Objectives:
1. To appreciate that suicide risk should also be considered in treatment of somatic symptom and related disorders.
2. To recognize hypochondriasis as a potential exception to this increase in risk.
3. To understand that risk is probably independent of co-occurring mood and anxiety disorders.

14. OBESOGENIC MEDICATIONS AND WEIGHT GAIN OVER 24 WEEKS IN PATIENTS WITH DEPRESSION: RESULTS FROM THE GUIDED STUDY

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Abstract:
Background: Weight gain is a common side-effect of medications used to treat major depressive disorder (MDD). We sought to determine if specific medication classes used in the treatment of MDD in a 24-week follow-up study resulted in significant weight gain in patients who had failed at least one medication trial. We also evaluated if bupropion was effective at mitigating weight gain from obesogenic medications, since bupropion is commonly used with other agents, sometimes under the auspices of mitigating weight gain.

Methods: In a post hoc analysis, of the Genomics Used to Improve DEpression Decisions (GUIDED) study of patients with MDD who failed at least one medication trial, we analyzed patients with weight available at baseline and 12 weeks (n=1,032) or 24 weeks (n=871). We contrasted weight gain between those on high or not on high-risk medications and assessed whether the addition of bupropion attenuated any weight gain. Weight gain was then assessed with more traditional medication classes and with adjustment for potential confounding variables.

Results: Those on medications identified as high risk for weight gain were significantly more likely to experience clinically significant weight gain ($\geq$3%) at 12 weeks (29.3% vs. 16.3%, p<.001) and 24 weeks (33.5% vs. 23.5%, p=.015). Those taking bupropion (N=31) with a high-

risk medication also frequently experienced clinically significant weight gain (35% and 52% at 12 and 24 weeks). Antipsychotic medications and tricyclic antidepressants were most often associated with clinically significant weight gain.

Conclusions: This study emphasizes the real-world risk of weight gain for patients with MDD and a history of non-response on medications with high risk for weight gain, especially for patients taking antipsychotics, which does not appear to be mitigated by concurrent bupropion use.

Keywords: Major Depressive Disorder; Antidepressants; Weight Gain

Learning Objectives:
1. Recognize the importance of monitoring weight change with treatment.
2. Identify medications at high risk of weight gain.
3. Understand that bupropion is not an evidence-based option to counter weight gain from high risk medications.