CANADIAN JOURNAL of UNDER GRADUATE RESEARCH

Words to remember

"When contemplating the history of Indigenous-settler relations in North America, it is important to consider whose stories are being privileged, and why" (p.12)

DECEMBER 2021 VOL 6(2)

www.cjur.ca

Mind-manifesting

"Although psychedelics have faced cultural hurdles, the re-emergence of psychedelic research instills hope for the treatment of pervasive psychiatric disorders" (p.6)

Confidence is key

"Due to ambiguity in how to best monitor for clozapine-related adverse effects, healthcare providers may lack confidence in optimally caring for patients on clozapine" (p.22)

CANADIAN JOURNAL *of* UNDERGRADUATE RESEARCH

A student-led publication that aims to highlight research by undergraduate students of all disciplines

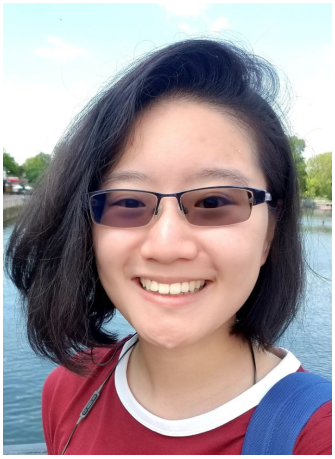
Second Issue of the Sixth Volume December 2021

Courtesy of the Undergraduate Research Opportunities, University of British Columbia, Vancouver

www.cjur.ca

ISSN: 2563-5689

Letter from the editors-in-chief



It is with great delight and pride that we, as the new Editors-in-Chief, present you with Volume 6 Issue 2 of the Canadian Journal of Undergraduate Research (CJUR). This year in CJUR has marked an extensive turnover of our editorial board, and we would like to thank our wonderful editors, copyeditors, and typesetters for all their hard work, enthusiasm, and dedication to the journal. It is always an inspiration to work with those who share the same passions and visions as ourselves, and this year has proven to be yet another reminder of that.

Since May 2021, we have received an unprecedented volume of new submissions, and for the first time since CJUR's inception, have had to close submissions to keep the workload feasible for our team. With the publication of this issue, we will likely be opening submissions again in the new year, and we invite any undergraduates interested in publishing with us to take the opportunity to submit their research.

This issue of CJUR consists of six articles from a wide variety of disciplines with topics ranging from the importance of memorializing Indigenous history to exploring the therapeutic potential of psychedelic substances to treat psychiatric disorders. The journal reflects the perseverance and diligence of undergraduate students across the nation, all of whom have continued to take strides forward in their careers despite all of the challenges we have collectively faced this past year.

Thank you to everyone who has continued to support CJUR over the years, and we hope that you enjoy Volume 6 Issue 2.

Yours sincerely,

Ryan Chan

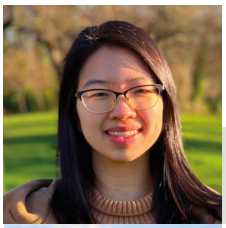
BSc Cellular, Anatomical, and Physiological Sciences (Hons.)

Claire Cheung

BSc Pharmacology

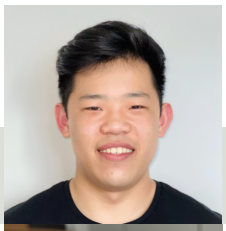
EDITORS-IN-CHIEF 2021-2022

EDITORIAL BOARD



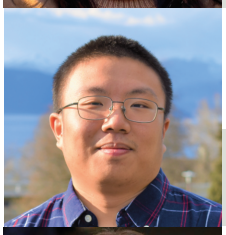
Candice Chua

BSc Chemistry (Hons.)



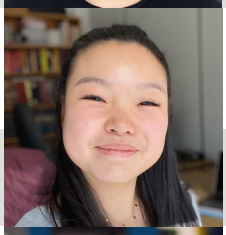
Jerry He

BSc Microbiology and Immunology, Minor in History



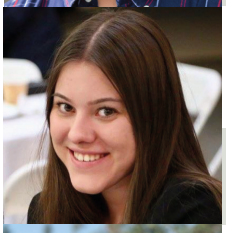
Tommy Kuo, BSc

MSc Botany



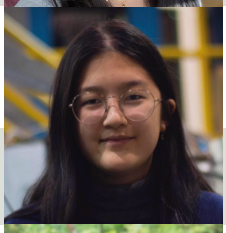
Danielle Lee

BA Classical Studies, English Language and Literature



Michelle Lisonek, BSc

MD



Monica Luo

BSc Physics (Hons.)

Mohammed Obaid

BSc Biophysics (Hons.)

Imogen Porter

BSc Microbiology and Immunology (Hons.)

SENIOR ADVISOR

Mahta Amanian, BSc

BSc Microbiology and Immunology (2020)

December 2021
Volume 6, Issue 2

Psychotomimetic to Mind-Manifesting: The Evolution of Psychedelics in Psychotherapy

Klaudia Szczech [1]

[1] Ryerson University, Toronto, Ontario

Abstract Human use of psychedelic substances has been practiced for 5,700 years in social, religious, and medicinal applications alike. Early pharmacological study of lysergic acid diethylamide (LSD) and other "classic psychedelics" psilocybin, mescaline, and N,N-dimethyltryptamine (DMT), suggested therapeutic potential for conditions such as anxiety and substance dependence. Additionally, research indicated that psychedelics were neither addictive nor toxic and appeared to produce several positive effects after a single dosing session. Criticism of methodological shortcomings, alongside cultural stigma and criminalization, ultimately curtailed further scientific investigation of psychedelics in the context of psychotherapy. Despite marked historical hurdles, the recent resurgence of clinical examination involving psychedelics suggests that the scientific community has begun to look beyond the stigmatization of such substances and towards their therapeutic potential. Through a broad examination of early and contemporary clinical trials, this article explores the prospect of psychedelics as psychotherapy in the context of methodological, cultural, and political influences. This analysis outlines the historical evolution of psychedelic clinical investigation, with the aim of presenting the warranted and unbiased study of psychedelic-assisted psychotherapy in light of current public health demands.

Published online
21 December 2021

Citation
Szczech, K. (2021). Psychotomimetic to Mind-Manifesting: The Evolution of Psychedelics in Psychotherapy. *CJUR*, 6(2), 6-11.

Address correspondence to
klaudia.szczech@ryerson.ca

INTRODUCTION

Humans have interacted with psychedelic substances for millennia – from indigenous healing ceremonies corresponding to 3780-3660 BCE to widespread recreational use and recent clinical trials (Nutt & Carhart-Harris, 2021; Guerra-Doce, 2015). The synthesis, and subsequent accidental self-administration, of lysergic acid diethylamide (LSD) by Albert Hofmann in 1938 gave rise to pharmacological exploration of the "classic psychedelics" LSD, psilocybin, mescaline and N,N-dimethyltryptamine (DMT), clustered on the basis of their common serotonergic mechanism of action (Fuentes et al., 2020). Over three decades, psychedelics garnered extensive investigation across psychoanalytic, psychotherapeutic, and psychopharmacological disciplines, yielding more than 1,000 scientific reports involving an estimated 40,000 patients (Belouin & Henningfield, 2018). Researchers grew divided by virtue of conflicting treatment models, inconclusive results, and overzealous endorsements both for and against the use of psychedelics in clinical settings. Despite ongoing interest, psychedelic research was brought to a halt by advancing methodological research requirements, association with counterculture recreational use, and international prohibition by The United Nations (UN) Convention on Psychotropic Substances of 1971 (Sellers, 2017).

The turbulent reputation of psychedelics in psychotherapy can be illustrated by the term's etymological journey from the mid-20th century to present use. *Psychotomimetics*, used amongst clinicians in the 1950s, distinguished such substances as evoking a pathological state similar to psychosis (Nichols, 2016). This was then replaced by *hallucinogens*, a pejorative misnomer demarcating hallucinations as their defining feature, the label still being widely used today (Johnson et al., 2008). More recently, *psychedelics*, a neologism first proposed by Humphry Osmond in 1957 to mean "mind-manifesting" (Osmond, 1957), has gained credibility in clinical research. Although psychedelics and their advocates have faced methodological challenges, cultural hurdles, and political strife, the recent re-emergence of

psychedelic research instills hope for the treatment of pervasive psychiatric disorders, easing of stigma, and advancement of science. This review presents a historical account of psychedelic research through a combined methodological, cultural, and political lens, with the aim of demonstrating the potential of psychedelic-assisted psychotherapy in assuaging current public health demands.

EARLY ENTHUSIASM (1949-1966)

Preliminary research investigating the properties of psychedelics was born from the observation that LSD induced a "model psychosis" resembling the subjective effects of schizophrenia (Abramson, 1967; Liechti, 2017). By this reasoning, LSD and other psychedelics could be employed to inform the underlying mechanisms of psychiatric disorders with the possibility of use within therapeutic settings. It should be noted that although the effects of psilocybin, mescaline, and DMT were investigated during this period, the vast majority of early psychedelic research examined LSD. This evident focus may be attributed to LSD research being well underway by the time that psilocybin and DMT were isolated, in 1959 (Hofmann et al., 1959) and 1956 (Szara, 1956), respectively. Mescaline was first isolated in 1896 (Heffter, 1896, as cited in Cassels & Saez-Briones, 2018) and investigated throughout the first half of the twentieth century; however, the attention of clinical researchers shifted to LSD due to its similar psychedelic properties with fewer physical side effects (Abbott, 2019).

Between 1949 and 1966, Sandoz Pharmaceutical Laboratories globally distributed LSD, drug trade name Delysid, to physicians and research institutes in order to elucidate the nature of psychoses and explore its potential as an aid to psychotherapy (Passie et al., 2008). Use of LSD as mock psychosis was eventually rejected by the scientific community due to dissimilarities between psychedelic drug effects and schizophrenic symptoms, as well as safety concerns over exacerbating psychotic symptoms in those diagnosed with or at-risk of developing psychotic disorders (Rucker et al., 2016; Grinspoon & Bakalar, 1979). However, it is argued that this early research surrounding psychedelics contributed to an understanding of neurotransmitter serotonin in the brain, and the biochemical theory of schizophrenia (Dyck, 2006).

By 1957, research groups lead by Humphry Osmond and Abram Hoffer had proposed a systematic psychedelic treatment paradigm based on the model pioneered by Alfred Hubbard, the "unpublicized father of the American psychedelic therapy movement" (Caldwell, 1968, as cited in Mangini, 1998). According to Osmond (1957), Hubbard had effectively treated a large series of patients diagnosed with poor prognostic alcoholism with his treatment model, in which several hours of psychotherapy preceded a guided high-dose LSD session, followed by extensive discussion of the patient's experience. Pre-dosing sessions were structured as preparation for the substantial physiological and psychological symptoms of the psychedelic experience, of which could include increased heart rate, blood pressure and temperature, abnormalities in visual perception, fear, hostility, anxiety, and euphoria (Hoffer, 1967). The drug dose was administered in a comfortable and relaxing environment designed to maximize a spiritual and transformative experience while minimizing any risk of adverse reactions, employing elements of music, paintings, and religious stimuli. The role of the psychotherapist was one of emotional support and guidance (Blewett & Chwelos, 1959). Upon the waning of drug effects, often lasting up to 12 hours, the patient was to be accompanied by a caretaker if discharged, or by the therapist or supportive nurse if an in-patient. The therapist would follow-up with the patient in the immediate days following the dosing session in order to integrate the experience and document any adversities or complications (Hoffer, 1967).

The psychotherapeutic component was integral to the treatment model. Researchers who adhered to the model noted that LSD was not a medicine in the typical pharmacoactive sense, but rather acted as a catalyst for the observed benefit of the psychedelic-assisted treatment (MacLean et al., 1961; Jensen & Ramsay, 1963). A World Health Organization study group (1958) indicated that the interpersonal and motivational context of the drug session had the potential to manipulate the psychedelic response when drug, dose and subject were kept constant. All extrapharmacological variables, including a trained psychedelic therapist, intimate rapport with the patient, physical environment, and mood state of both patient and clinical personnel, were considered as fundamental to the psychedelic experience as the drug itself (Hoffer, 1967). Researchers emphasized the cruciality of attending to such factors, coined "set and setting" (Leary et al., 1963), to maximize therapeutic benefit and necessitate safety precautions in consideration of the significant psychological symptoms. Such precautions extended to ensuring adequate patient screening prior to treatment, as a result of reported prolonged psychotic reactions in patients with a history of psychotic episodes (Baker, 1964; Sandison & Whitelaw, 1957; Cohen & Ditman, 1963). Clearly defined exclusion criteria, including personal or family history of psychotic symptoms and cardiovascular conditions, were designed to effectively minimize the risk of adverse reactions.

Throughout the 1950s and 60s, LSD remained a widely utilized tool in therapeutic settings across the globe due to its apparent ability to catalyze changes in attitude, perspective, and behavior after a single dosing session (Savage, 1952; MacLean et al, 1961). The psychedelic-assisted treatment model was successfully employed by a number of researchers in the treatment of several conditions, such as alcohol dependence (MacLean et al, 1961; Chwelos et al, 1959), treatment-resistant anxiety (Sandison & Whitelaw, 1957; Sherwood et al, 1962), terminal cancer-related depression (Pahnke et al., 1969), and obsessive-compulsive disorder (OCD) (Jackson, 1962). Clinical observation and self-reports indicated that individuals exposed to LSD and other psychedelics experienced meaningful psychological shifts such as feelings of oneness, mystical experiences, and bliss (MacLean et al, 1961; Pahnke et al., 1969). Further, early research suggested that psychedelics employed in a controlled and supervised setting were not only viable as therapeutic aids for select patients, but that they were neither addictive nor toxic (Cohen, 1960; Pos, 1966; Smart & Bateman, 1967).

COALESCING CONCERNS (1960s-1974)

Methodological Limitations

Though early accounts of psychedelic-assisted psychotherapy suggested promising results for a variety of psychiatric disorders, it is essential to report that the majority of such claims were

derived from studies which fell short of sufficient methodological standards. Criticisms include lack of placebo control groups and blinding, extravagant claims based on anecdotal case studies and subjective evaluation, and no account for the contribution of non-drug variables (Hollister et al., 1969; Smart et al., 1966). Of note, Cohen and Ditman (1963) and Levine and Ludwig (1964) pointedly remark that many overemphasized reports of adverse events came from comparable anecdotal case histories and uncontrolled studies. A distinct breach formed between researchers on account of treatment methodology: there were those who believed the subjective psychological shift facilitated by psychedelics was an essential element of the therapeutic process, and those who were enthusiastically skeptical of psychedelic research entirely (Smart et al., 1966; Ludwig et al., 1969).

This divide was amplified by the 1962 Kefauver Harris Amendments (hereafter referred to as The Amendments) to the Food, Drug and Cosmetic Act (FDCA) in the United States. The Amendments were enacted in response to the worldwide thalidomide crisis, by which an estimated 15,000 children were born with malformations attributed to its teratogenic properties (Mangini, 1998). The Amendments formally required all clinical drug trials to provide proof of efficacy by means of randomized, double-blind, placebo-controlled experimental designs with large samples and sophisticated statistical analyses (Oram, 2014). Additionally, any drug studies involving human participants required an investigational new drug (IND) order with detailed information outlining drug chemistry and manufacturing, toxicology, and investigator qualifications (Bonson, 2018). The Amendments and associated IND applications were enforced to maximize safety and produce objective results, and are largely founded on the assumption that all drug therapies operate via primarily pharmacological mechanisms (Dyck, 2005). Psychedelic-assisted therapy and associated research was required to meet such regulations and, as such, psychedelic therapists had the unique and unprecedented task of providing proof of efficacy for a psychotherapeutic treatment (Oram, 2014).

Prior to The Amendments, psychedelic research was centred around small samples of carefully selected patients within an emotionally supportive and physically comfortable environment, with substantial psychotherapeutic preparation and debriefing. As selected patients were typically resistant to prior treatment attempts, any improvement after psychedelic intervention was considered a positive result (Sandison et al., 1954; Osmond, 1957; MacLean et al., 1961). After 1962, research groups began to design clinical psychedelic trials within the newly required experimental parameters – favouring the randomization of large participant samples and elaborate statistical methods over preparatory therapy, an appropriate dosing environment, and guidance through dosing sessions.

Several research groups attempted controlled clinical trials with LSD in the context of psychedelic-assisted therapy for alcohol dependence (Jensen & Ramsay, 1963; Cheek et al., 1966; Kurland et al., 1971) and terminal cancer-related depression (Pahnke et al., 1969). The required double-blind, placebo-controlled design posed an inherent challenge for psychedelic research, as the marked drug effects inevitably eliminated the possibility of a true blind. The use of low-dose LSD as placebo, among further criticisms of uncontrolled non-drug variables, negated any positive results attributed to LSD's therapeutic efficacy (Mangini, 1998). In response, research groups who strictly adhered to the new methodological requirements disregarded fundamental components of the psychedelic-assisted treatment model, namely patient screening, therapeutic preparation, and suitable dosing environment. The majority of such studies produced results which indicated that LSD-assisted therapy was not clinically superior to dextroamphetamine (Hollister et al., 1969), methylphenidate and chlordiazepoxide (Ditman et al., 1969), or non-LSD psychotherapy (Ludwig et al., 1969). Despite criticisms that these studies radically disregarded a considerable proportion of psychedelic-assisted treatment methods, the scientific community ultimately rejected any ostensible potential of LSD-assisted therapy. The National Institute for Mental Health (NIMH) reported that LSD had no therapeutic applications in 1974, and terminated all psychedelic research funding the following year (Bonson, 2018).

Cultural and Political Restraints

While psychedelic researchers attempted to maneuver increasingly strict clinical research requirements, rapidly growing recreational use of illicit psychedelics raised legitimate concerns of safety (Mangini, 1998). Records of widespread unsupervised LSD use flooded scientific reports and newspapers alike and, as frequency of use increased, so did reports of "bad trips" and hazardously unpredictable behavior (McGlothin & Arnold, 1971; Fuentes et al., 2020). Statements outlining the dangers of LSD and other psychedelics typically referred to those associated with recreational use, though were often not stated as such (Fink et al., 1966). A review by Smart and Bateman (1967) investigating records of unfavourable reactions to LSD, including prolonged psychotic reactions and suicide rates, confirmed that significantly more cases of prolonged psychoses originated from illicit polydrug use or when taken alone in unsupervised settings, and those which occurred in experimental or therapeutic settings were typically attributed to psychotic predispositions. Additionally, though it is difficult to trace the causality of suicide associated with LSD therapy, rates appeared to be low. Despite several reports of the relative safety of psychedelic use within carefully prescribed conditions (Pahnke et al., 1969; Savage, 1964; MacLean et al., 1961), not uncommon adverse events associated with recreational use soon became intertwined with controlled psychedelic research.

Outside of the scientific realm, psychedelics became the sensationalized targets of cultural and political condemnation. Psychedelics became associated with the counterculture of "hippies" and the "troubled youth" in the 1960s, coupled with student riots and demonstrations against the Vietnam War (Nichols, 2016). Media outlets portrayed psychedelics as dangerous substances that were corrupting the minds of young people with headlines like "A Slaying Suspect Tells of LSD Spree: Medical Student Charged in Mother-in-Law's Death" (New York Times, 1966). Overstated tales of drug-induced insanity and attempts to fly were rampant across mainstream media platforms. Moral panic and the political climate surrounding psychedelics further stifled clinical investigation, culminating in the regulation of LSD and other psychedelics as Schedule I substances, as per The UN Convention on Psychotropic Substances of 1971 (United Nations, 1971). Schedule I substances are defined by high abuse potential and have no accepted medical use, outside of research which looks to identify risk and harmful properties (Nutt et al., 2013). As such, psychedelic research in the context of therapeutic potential was effectively ceased.

RECENT REVIVAL (1990s-PRESENT)

Looking to revive the interrupted scientific inquiry of psychedelics, researchers have once again turned to the potential clinical application of such substances, now sufficiently equipped with advanced technology and innovative methodological approaches to meet required regulations. Strassman and Qualls (1994) and Hermle et al. (1992) prompted this return by examining the psychopharmaceutical effects of DMT and mescaline, respectively. Doblin (1991) extended Pahnke's 1962 "Good Friday experiment", in which divinity students were administered psilocybin to discern whether it could elicit a mystical experience comparable to those described in religious literature. 19 of the 20 original participants reported not only a lack of adverse effects, but also that the psychedelic experience had been one of the most significant events of their lives. The major neurological discovery of the central role of serotonin 5HT-2A receptor in the psychedelic response by Vollenweider et al. (1998) broadened the field further, while the results of a recent meta-analysis supported the efficacy of LSD in treating alcoholism found in early trials (Krebs & Johansen, 2012). Additionally, Moreno et al. (2006) extended early anecdotal evidence for the successful treatment of OCD with psilocybin. In response to this resurgence, detailed guidelines for the safe administration of human psychedelic research have now been put forth - notably incorporating key elements of participant screening, preparation, dosing context, and post-session integration of earlier models (Johnson et al., 2008).

Doblin et al. (2019) report that there are currently more clinical trials investigating the core features and therapeutic effects of psychedelics than at any other time in history. This has largely been a consequence of the NIMH reinstating funding for the research of psilocybin, and related substances MDMA and ketamine in 2015 (Bonson, 2018). Recent clinical trials in the growing body of psychedelic research have produced promising results for LSD-assisted psychotherapy in the treatment of anxiety associated with terminal diagnoses (Gasser et al., 2015), psilocybin-assisted psychotherapy for alcohol dependence (Bogenschutz et al., 2015), smoking cessation (Johnson et al., 2017), cancer-related anxiety and depression (Griffiths et al., 2016), and treatment-resistant depression (Carhart-Harris, Bolstridge, et al., 2018; Davis et al., 2020).

A survey of 190,000 respondents conducted by Hendricks et al. (2015) found a significant correlation between lifetime psychedelic use and decreased psychological distress and suicidality, while other studies have begun to explore dosing thresholds (Bershad et al., 2019; Family et al., 2019) and the underlying mechanisms of extrapharmacological components within psychedelic-assisted psychotherapy (Kaelen et al., 2016; Haijen et al., 2018). Importantly, research has also turned to examining negative effects of psychedelic use (Carbonaro et al., 2016; Ona, 2018) and rare cases of Hallucinogen Persisting Perception Disorder (Hermle et al., 2012; Orsolini et al., 2017).

TO THE FUTURE

With the stigma of counterculture vastly dissipated, there are but two overarching limitations to which psychedelic researchers must attend in future trials: methodological considerations in research design, and political regulation. The former includes historical challenges of psychedelic research such as developing and maintaining double-blind and placebo-controlled designs, which have now been successfully adopted in two randomized clinical trials with promising results (Ross et al., 2016; Palhano-Fontes et al., 2018). Ethical considerations involving withholding treatment from control groups must also be made; this may be achieved by using active comparators or offering treatment to controls upon study conclusion (Barnby & Mehta, 2018). Although the now widely used psychedelic treatment model – emphasizing patient screening and preparation, appropriate dosing environment, and integration – has largely minimized the risk of adverse reactions, participants and researchers must be aware of transient, yet unpleasant, effects (Carhart-Harris, Roseman, et al., 2018). It is also noted that the model requires significant resources, such as lengthy commitment, specialized training, and designated dosing environments (Nutt & Carhart-Harris, 2021). Further, non-drug components must be systematically controlled and documented to allow for future examination and valid replication of studies (Rucker et al., 2016).

The latter limitations, however, go beyond clinical reach and into the realm of legislative regulatory bodies. There exists a common sentiment that the severe criminalization of psychedelics is not founded on relative risk, but rather on restrictive socio-political beliefs (Gardner et al., 2019; Hendricks et al., 2015; Bonson, 2018). Rucker et al. (2016) outlined the case of opioids, which are widely used in medical contexts despite their considerable harm in recreational settings. The recent appointment of MDMA-assisted psychotherapy for PTSD and psilocybin for treatment-resistant depression as Breakthrough Therapies is a hopeful step towards reform (Gardner et al., 2019). However, the continued penalization of psychedelics has hindered clinical research and must be accordingly amended for the advancement of science and public health. There is a dire need for reformation, as is evident by staggering statistics of mental illness, substance abuse and preventable fatalities (Johnson et al., 2017; Hendricks et al., 2015). The paucity of effective treatments for myriad public health challenges calls for the ethical, impartial, and evidence-informed examination of psychedelic-assisted psychotherapy.

CONCLUSION

From mock psychosis to manifestations of mysticism, the perception of psychedelics has adopted many forms across history and experimental paradigms. Though incontestable claims for or against psychedelic research cannot yet be made, limitations in available treatment for many pervasive mental health disorders warrant the unbiased, politically unhindered, and methodologically sound examination of psychedelic substances in the context of psychotherapy. Only with such clinical investigation will the potential which Grof (1980) foresaw be ascertained: "psychedelics to be for psychiatry what the microscope is for biology and medicine or the telescope for astronomy".

CONFLICTS OF INTERESTS

The author declares no conflicts of interest.

REFERENCES

[1] Abbott, A. (2019). Altered minds: Mescaline's complicated history. *Nature, 569*(7757), 485-486. https://doi.org/10.1038d41586-019-01571-2

[2] Abramson, H. A. (1967). *Use of LSD in psychotherapy and alcoholism.* Bobbs-Merrill Co.

[3] Baker, E. F. (1964). The use of lysergic acid diethylamide (LSD) in psychotherapy. *Canadian Medical Association Journal, 91*(23), 1200–1202.

[4] Barnby, J. M., & Mehta, M. A. (2018). Psilocybin and Mental Health-Don't Lose Control. *Frontiers in Psychiatry, 9*, 293. https://doi.org/10.3389/fpsyt.2018.00293

[5] Belouin, S. J., & Henningfield, J. E. (2018). Psychedelics: Where we are now, why we got here, what we must do. *Neuropharmacology, 142*, 7–19. https://doi.org/10.1016/j.neuropharm.2018.02.018

[6] Bershad, A. K., Schepers, S. T., Bremmer, M. P., Lee, R., & de Wit, H. (2019). Acute subjective and behavioral effects of Microdoses of lysergic acid diethylamide in Healthy human volunteers. *Biological Psychiatry, 86*(10), 792-800. https://doi.org/10.1016/j.biopsych.2019.05.019

[7] Blewett, D. B., & Chwelos, N. (1959). *Handbook for the therapeutic use of LSD: Individual and group procedures.* MAPS Multidisciplinary Association for Psychedelic Studies. https://maps.org/resources/responding-to-difficult-psychedelic-experiences/185-handbook-for-the-therapeutic-use-of-lysergic-acid-diethylamide-25

[8] Bogenschutz, M. P., Forcehimes, A. A., Pommy, J. A., Wilcox, C. E., Barbosa, P. C., & Strassman, R. J. (2015). Psilocybin-assisted treatment for alcohol dependence: a proof-of-concept study. *Journal of Psychopharmacology, 29*(3), 289–299. https://doi.org/10.1177/0269881114565144

[9] Bonson, K. R. (2018). Regulation of human research with LSD in the United States (1949-1987). *Psychopharmacology, 235*(2), 591–604. https://doi.org/10.1007/s00213-017-4777-4

[10] Carbonaro, T. M., Bradstreet, M. P., Barrett, F. S., MacLean, K. A., Jesse, R., Johnson, M. W., & Griffiths, R. R. (2016). Survey study of challenging experiences after ingesting psilocybin mushrooms: Acute and enduring positive and negative consequences. *Journal of Psychopharmacology, 30*(12), 1268–1278. https://doi.org/10.1177/0269881116662634

[11] Carhart-Harris, R. L., Bolstridge, M., Day, C., Rucker, J., Watts, R., Erritzoe, D. E., Kaelen, M., Giribaldi, B., Bloomfield, M., Pilling, S., Rickard, J. A., Forbes, B., Feilding, A., Taylor, D., Curran, H. V., & Nutt, D. J. (2018). Psilocybin with psychological support for treatment-resistant depression: six-month follow-up. *Psychopharmacology, 235*(2), 399–408. https://doi.org/10.1007/s00213-017-4771-x

[12] Carhart-Harris, R. L., Roseman, L., Haijen, E., Erritzoe, D., Watts, R., Branchi, I., & Kaelen, M. (2018). Psychedelics and the essential importance of context. *Journal of Psychopharmacology, 32*(7), 725–731. https://doi.org/10.1177/0269881118754710

[13] Cassels, B. K., & Sáez-Briones, P. (2018). Dark classics in chemical neuroscience: Mescaline. *ACS Chemical Neuroscience, 9*(10), 2448-2458. https://doi.org/10.1021/acschemneuro.8b00215

[14] Cheek, F., Osmond, H., Sarrett, M., & Albahary, R. S. (1966). Observations regarding the use of LSD-25 in the treatment of alcoholism. *Journal of Psychopharmacology, 1*(2), 56-74.

[15] Chwelos, N., Blewett, D. B., Smith, C. M., & Hoffer, A. (1959). Use of d-lysergic acid diethylamide in the treatment of alcoholism. *Quarterly Journal of Studies on Alcohol, 20*(3), 577–590. https://doi.org/10.15288/qjsa.1959.20.577

[16] Cohen, S. (1960). Lysergic acid diethylamide: side effects and complications. *The Journal of Nervous and Mental Disease, 130*, 30–40. https://doi.org/10.1097/00005053-196001000-00005

[17] Cohen, S., & Ditman, K. S. (1963). Prolonged adverse reactions to lysergic acid diethylamide. *Archives of General Psychiatry, 8*, 475–480. https://doi.org/10.1001/archpsyc.1963.01720110051006

[18] Davis, A. K., Barrett, F. S., May, D. G., Cosimano, M. P., Sepeda, N. D., Johnson, M. W., Finan, P. H., & Griffiths, R. R. (2020). Effects of psilocybin-assisted therapy on major depressive disorder: A randomized clinical trial. *JAMA psychiatry*, e203285. https://doi.org/10.1001/jamapsychiatry.2020.3285

[19] Ditman, K. S., Moss, T., Forgy, E. W., Zunin, L. M., Lynch, R. D., & Funk, W. A. (1969). Dimensions of LSD, methylphenidate and chlordiazepoxide experiences. *Psychopharmacologia, 14*(1), 1–11. https://doi.org/10.1007/BF00401528

[20] Doblin, R. (1991). Pahnke's "Good Friday experiment": a long-term follow-up andmethodological critique. *Journal of Transpersonal Psychology, 23*(1), 1–28.

[21] Doblin, R. E., Christiansen, M., Jerome, L., & Burge, B. (2019). The past and Future of psychedelic science: An introduction to this issue. *Journal of Psychoactive Drugs, 51*(2), 93–97. https://doi.org/10.1080/02791072.2019.1606472.

[22] Dyck, E. (2005). Flashback: Psychiatric experimentation with LSD in historical perspective. *The Canadian Journal of Psychiatry, 50*(7), 381-388. https://doi.org/10.1177/070674370505000703

[23] Family, N., Maillet, E. L., Williams, L., Krediet, E., Carhart-Harris, R. L., Williams, T. M., Nichols, C. D., Goble, D. J., & Raz, S. (2020). Safety, tolerability, pharmacokinetics, and pharmacodynamics of low dose lysergic acid diethylamide (LSD) in healthy older volunteers. *Psychopharmacology, 237*(3), 841–853. https://doi.org/10.1007/s00213-019-05417-7

[24] Fink, M., Simeon, J., Haque, W., & Itil, T. (1966). Prolonged adverse reactions to LSD in psychotic subjects. *Archives of General Psychiatry, 15*(5), 450–454. https://doi.org/10.1001/archpsyc.1966.01730170002002

[25] Fuentes, J. J., Fonseca, F., Elices, M., Farré, M., & Torrens, M. (2020). Therapeutic use of LSD in psychiatry: A systematic review of randomized-controlled clinical trials. *Frontiers in Psychiatry, 10*, 943. https://doi.org/10.3389/fpsyt.2019.00943

[26] Gardner, J., Carter, A., O'Brien, K., & Seear, K. (2019). Psychedelic-assisted therapies: The past, and the need to move forward responsibly. *The International journal on drug policy, 70*, 94–98. https://doi.org/10.1016/j.drugpo.2019.05.019

[27] Gasser, P., Kirchner, K., & Passie, T. (2015). LSD-assisted psychotherapy for anxiety associated with a life-threatening disease: a qualitative study of acute and sustained subjective effects. *Journal of Psychopharmacology, 29*(1), 57–68. https://doi.org/10.1177/0269881114555249

[28] Griffiths, R. R., Johnson, M. W., Carducci, M. A., Umbricht, A., Richards, W. A., Richards, B. D., Cosimano, M. P., & Klinedinst, M. A. (2016). Psilocybin produces substantial and sustained decreases in depression and anxiety in patients with life-threatening cancer: A randomized double-blind trial. *Journal of Psychopharmacology, 30*(12), 1181–1197. https://doi.org/10.1177/0269881116675513

[29] Grinspoon, L., & Bakalar, J. B. (1979). *Psychedelic Drugs Reconsidered.* Basic Books.

[30] Grof, S. (1980). *LSD Psychotherapy.* Hunter House.

[31] Guerra-Doce, E. (2015). Psychoactive substances in prehistoric times: Examining the archaeological evidence. *Time and Mind, 8*(1), 91-112. https://doi.org/10.1080/1751696X.2014.993244

[32] Haijen, E., Kaelen, M., Roseman, L., Timmermann, C., Kettner, H., Russ, S., Nutt, D., Daws, R. E., Hampshire, A., Lorenz, R., & Carhart-Harris, R. L. (2018). Predicting responses to psychedelics: A prospective study. *Frontiers in Pharmacology, 9*, 897. https://doi.org/10.3389/fphar.2018.00897

[33] Hendricks, P. S., Thorne, C. B., Clark, C. B., Coombs, D. W., & Johnson, M. W. (2015). Classic psychedelic use is associated with reduced psychological distress and suicidality in the United States adult population. *Journal of psychopharmacology, 29*(3), 280–288. https://doi.org/10.1177/0269881114565653

[34] Hermle, L., Fünfgeld, M., Oepen, G., Botsch, H., Borchardt, D., Gouzoulis, E., Fehrenbach, R. A., & Spitzer, M. (1992). Mescaline-induced psychopathological, neuropsychological, and neurometabolic effects in normal subjects: experimental psychosis as a tool for psychiatric research. *Biological Psychiatry, 32*(11), 976–991. https://doi.org/10.1016/0006-3223(92)90059-9

[35] Hermle, L., Simon, M., Ruchsow, M., & Geppert, M. (2012). Hallucinogen-persisting perception disorder. *Therapeutic Advances in Psychopharmacology, 2*(5), 199–205.https://doi.org/10.1177/2045125312451270

[36] Hoffer, A. (1967). A Program for the Treatment of Alcoholism: LSD, Malvaria and Nicotinic Acid, in Abramson H. (ed.), *The Use of LSD in Psychotherapy and Alcoholism*, 343-406. Bobbs-Merrill.

[37] Hofmann, A., Heim, R., Brack, A., Kobel, H., Frey, A., Ott, H., Petrzilka, T., & Troxler, F. (1959). Psilocybin und psilocin, zwei psychotrope wirkstoffe aus mexikanischen rauschpilzen. *Helvetica Chimica Acta, 42*(5), 1557–1572. https://doi.org/10.1002/hlca.19590420518

[38] Hollister, L. E., Shelton, J., & Krieger, G. (1969). A controlled comparison of lysergic acid diethylamide (LSD) and dextroamphetamine in alcoholics. *The American Journal of Psychiatry, 125*(10), 1352–1357. https://doi.org/10.1176/ajp.125.10.1352

[39] Jackson, D. D. (1962). LSD and the new beginning. *The Journal of Nervous and Mental Disease, 135*, 435–439.

[40] Jensen, S. E., & Ramsay, R. (1963). Treatment of chronic alcoholism with lysergic acid diethylamide. *Canadian Psychiatric Association Journal, 8*(3), 182-188. https://doi.org/10.1177/070674376300800305

[41] Johnson, M., Richards, W., & Griffiths, R. (2008). Human hallucinogen research: guidelines for safety. *Journal of Psychopharmacology, 22*(6), 603–620. https://doi.org/10.1177/0269881108093587

[42] Johnson, M. W., Garcia-Romeu, A., & Griffiths, R. R. (2017). Long-term follow-up of psilocybin-facilitated smoking cessation. *The American Journal of Drug and Alcohol Abuse, 43*(1), 55–60. https://doi.org/10.3109/00952990.2016.1170135

[43] Kaelen, M., Roseman, L., Kahan, J., Santos-Ribeiro, A., Orban, C., Lorenz, R., Barrett, F. S., Bolstridge, M., Williams, T., Williams, L., Wall, M. B., Feilding, A., Muthukumaraswamy, S., Nutt, D. J., & Carhart-Harris, R. (2016). LSD modulates music-induced imagery via changes in parahippocampal connectivity. *The Journal of the European College of Neuropsychopharmacology, 26*(7), 1099–1109. https://doi.org10.1016j.euroneuro.2016.03.018

[44] Krebs, T. S., & Johansen, P. Ø. (2012). Lysergic acid diethylamide (LSD) for alcoholism: meta-analysis of randomized controlled trials. *Journal of Psychopharmacology, 26*(7), 994–1002. https://doi.org/10.1177/0269881112439253

[45] Kurland, A. A., Savage, C., Pahnke, W. N., Grof, S., & Olsson, J. E. (1971). LSD in the treatment of alcoholics. In: Vinar O, Votava Z, Bradley PB (eds). *Advances in neuropsychopharmacology: proceedings of the 7th congress of the collegium internationale neuro-psychopharmacologicum.* North-Holland.

[46] Leary, T., Litwin, G. H., & Metzner, R. (1963). Reactions to psilocybin administered in a supportive environment. *The Journal of Nervous and Mental Disease, 137*, 561–573. https://doi.org/10.1097/00005053-196312000-00007

[47] Liechti M. E. (2017). Modern Clinical Research on LSD. *Neuropsychopharmacology, 42*(11), 2114–2127. https://doi.org/10.1038/npp.2017.86

[48] Ludwig, A., Levine, J., Stark, L., & Lazar, R. (1969). A clinical study of LSD treatment in alcoholism. *The American Journal of Psychiatry, 126*(1), 59–69. https://doi.org/10.1176/ajp.126.1.59

[49] MacLean, J. R., MacDonald, D. C., Byrne, U. P., & Hubbard, A. M. (1961). The use of LSD-25 in the treatment of alcoholism and other psychiatric problems. *Quarterly Journal of Studies on Alcohol, 22*(1), 34–45. https://doi.org/10.15288/qjsa.1961.22.034

[50] Mangini, M. (1998). Treatment of alcoholism using psychedelic drugs: a review of the program of research. *Journal of Psychoactive Drugs, 30*(4), 381–418. https://doi.org/10.1080/02791072.1998.10399714

[51] McGlothlin, W. H., & Arnold, D. O. (1971). LSD revisited. A ten-year follow-up of medical LSD use. *Archives of General Psychiatry, 24*(1), 35–49. https://doi.org/10.1001/archpsyc.1971.01750070037005

[52] Moreno, F. A., Wiegand, C. B., Taitano, E. K., & Delgado, P. L. (2006). Safety, tolerability, and efficacy of psilocybin in 9 patients with obsessive-compulsive disorder. *The Journal of Clinical Psychiatry, 67*(11), 1735–1740. https://doi.org/10.4088/jcp.v67n1110

[53] New York Times. (1966, April 12). *A slaying suspect tells of LSD spree: medical student charged in mother-in-law's death.* Retrieved February 18, 2021 from https://www.nytimes.com/1966/04/12/archives/a-slaying-suspect-tells-of-lsd-spree-medical-student-charged-in.html

[54] Nichols D. E. (2016). Psychedelics. *Pharmacological Reviews, 68*(2), 264–355. https://doi.org/10.1124/pr.115.011478

[55] Nutt, D., & Carhart-Harris, R. (2021). The Current Status of Psychedelics in Psychiatry. *JAMA Psychiatry, 78*(2), 121–122. https://doi.org/10.1001/jamapsychiatry.2020.2171

[56] Nutt, D. J., King, L. A., & Nichols, D. E. (2013). Effects of Schedule I drug laws on neuroscience research and treatment innovation. *Neuroscience, 14*(8), 577–585. https://doi.org/10.1038/nrn3530

[57] Ona, G. (2018). Inside bad trips: Exploring extra-pharmacological factors, *Journal of Psychedelic Studies, 2*(1), 53-60. Retrieved Feb 26, 2021, from: https://akjournals.com/view/journals/2054/2/1/article-p53.xml

[58] Oram, M. (2014). Efficacy and enlightenment: LSD psychotherapy and the Drug Amendments of 1962. *Journal of the History of Medicine and Allied Sciences, 69*(2), 221–250. https://doi.org/10.1093/jhmas/jrs050

[59] Orsolini, L., Papanti, G. D., De Berardis, D., Guirguis, A., Corkery, J. M., & Schifano, F. (2017). The "Endless Trip" among the NPS Users: Psychopathology and psychopharmacology in the Hallucinogen-Persisting Perception Disorder. A systematic review. *Frontiers in psychiatry, 8*, 240. https://doi.org/10.3389/fpsyt.2017.00240

[60] Osmond, H. (1957). A review of the clinical effects of psychotomimetic agents. *Annals of the New York Academy of Sciences, 66*(3), 418–434. https://doi.org/10.1111/j.17496632.1957.tb40738.x

[61] Pahnke, W. N., Kurland, A. A., Goodman, L. E., & Richards, W. A. (1969). LSD-assisted psychotherapy with terminal cancer patients. *Current Psychiatric Therapies, 9*, 144–152.

[62] Palhano-Fontes, F., Barreto, D., Onias, H., Andrade, K. C., Novaes, M. M., Pessoa, J. A., Mota-Rolim, S. A., Osório, F. L., Sanches, R., Dos Santos, R. G., Tófoli, L. F., de Oliveira Silveira, G., Yonamine, M., Riba, J., Santos, F. R., Silva-Junior, A. A., Alchieri, J. C., Galvão-Coelho, N. L., Lobão-Soares, B., Hallak, J., … Araújo, D. B. (2019). Rapid antidepressant effects of the psychedelic ayahuasca in treatment-resistant depression: a randomized placebo-controlled trial. *Psychological Medicine, 49*(4), 655–663. https://doi.org/10.1017/S0033291718001356

[63] Passie, T., Halpern, J. H., Stichtenoth, D. O., Emrich, H. M., & Hintzen, A. (2008). The pharmacology of lysergic acid diethylamide: a review. *CNS Neuroscience & Therapeutics, 14*(4), 295–314. https://doi.org/10.1111/j.1755-5949.2008.00059.x

[64] Pos, R. (1966). LSD-25 as an Adjunct to Long-Term Psychotherapy. *Canadian Psychiatric Association Journal, 11*(4), 330–342. https://doi.org/10.1177/070674376601100410

[65] Ross, S., Bossis, A., Guss, J., Agin-Liebes, G., Malone, T., Cohen, B., Mennenga, S. E., Belser, A., Kalliontzi, K., Babb, J., Su, Z., Corby, P., & Schmidt, B. L. (2016). Rapid and sustained symptom reduction following psilocybin treatment for anxiety and depression in patients with life-threatening cancer: a randomized controlled trial. *Journal of Psychopharmacology, 30*(12), 1165–1180. https://doi.org/10.1177/0269881116675512

[66] Rucker, J. J., Jelen, L. A., Flynn, S., Frowde, K. D., & Young, A. H. (2016). Psychedelics in the treatment of unipolar mood disorders: a systematic review. *Journal of Psychopharmacology, 30*(12), 1220–1229. https://doi.org/10.1177/0269881116679368

[67] Sandison, R. A., Spencer, A. M., & Whitelaw, J. D. (1954). The therapeutic value of lysergic acid diethylamide in mental illness. *The Journal of Mental Science, 100*(419), 491–507. https://doi.org/10.1192/bjp.100.419.491

[68] Sandison, R. A., & Whitelaw, J. D. (1957). Further studies in the therapeutic value of lysergic acid diethylamide in mental illness. *The Journal of Mental Science, 103*(431), 332–343. https://doi.org/10.1192/bjp.103.431.332

[69] Savage, C. (1952). Lysergic acid diethylamide (LSD-25): a clinical-psychological study. *The American Journal of Psychiatry, 108*, 896–900. https://doi.org/10.1176/ajp.108.12.896

[70] Sellers, E. (2017). Psilocybin: Good trip or bad trip. *Clinical Pharmacology and Therapeutics, 102*(4), 580-584. https://doi.org/10.1002/cpt.697

[71] Sherwood, J. N., Stolaroff, M. J., & Harman, W. W. (1962). The psychedelic experience--a new concept in psychotherapy. *Journal of Neuropsychiatry, 4*, 69–80. https://doi.org/10.1080/02791072.1968.10524522

[72] Smart, R. G., & Bateman, K. (1967). Unfavourable reactions to LSD: a review and analysis of the available case reports. *Canadian Medical Association Journal, 97*(20), 1214–1221.

[73] Smart, R. G., Storm, T., Baker, E. F., & Solursh, L. (1966). A controlled study of lysergide in the treatment of alcoholism. I. The effects on drinking behavior. *Quarterly Journal of Studies on Alcohol, 27*(3), 469–482.

[74] Strassman, R. J., & Qualls, C. R. (1994). Dose-response study of N,N-dimethyltryptamine in humans. I. Neuroendocrine, autonomic, and cardiovascular effects. *Archives of General Psychiatry, 51*(2), 85–97. https://doi.org/10.1001/archpsyc.1994.03950020009001

[75] Szara, S. (1956). Dimethyltryptamin: Its metabolism in man; the relation to its psychotic effect to the serotonin metabolism. *Experientia, 12*(11), 441–442. https://doi.org/10.1007/BF02157378

[76] United Nations. (1971). *Convention on Psychotropic Substances*. UNODC [online], http://www.unodc.org/ pdf/convention_1971_en.pdf

[77] Vollenweider, F. X., Vollenweider-Scherpenhuyzen, M. F., Bäbler, A., Vogel, H., & Hell, D. (1998). Psilocybin induces schizophrenia-like psychosis in humans via a serotonin-2 agonist action. *Neuroreport, 9*(17), 3897–3902. https://doi.org/10.1097/00001756-199812010-00024

[78] World Health Organization. (1958). Ataractic and hallucinogenic drugs in psychiatry: Report of a study group. *World Health Organization Technical Report Series, 152*. https://apps.who.int/iris/handle/10665/40410

Memorializing Indigenous History: A Comparative Study of Canadian Settler Poet Laurie D. Graham and Oglala Lakota Poet Layli Long Soldier

Sarah Caley [1]

[1] Department of English and Film Studies, Wilfred Laurier University, Waterloo, Ontario

Abstract When contemplating the history of Indigenous-settler relations in North America, it is important to consider whose stories are being privileged, and why. This paper will offer a comparative study of recent works by Canadian settler poet Laurie D. Graham and Oglala Lakota poet Layli Long Soldier, both of whom address stories of nineteenth-century colonial violence against Indigenous people on either side of the Canada-US border. Both poets address similar Indigenous-settler dynamics relating to the government takeover of Indigenous lands, but use different literary techniques to do so. In her poems "Battleford Gravesite" and "Visiting Pîhtokahanapiwiyin's / Poundmaker's Grave," Graham writes about the 1885 Northwest Resistance in Saskatchewan, and the events which lead up to the hanging of eight Indigenous men—the largest mass hanging in Canadian history. In her poem "38," Long Soldier writes about the 1862 Sioux Uprising in Minnesota, and the eventual hanging of 38 men—the largest mass hanging in American history. Both poets question the memorialization of Indigenous history; however, Long Soldier ultimately takes her process of remembering further than Graham by suggesting that memorialization should consist of both written words and embodied actions. By looking at these works together as a non-Indigenous person, I will investigate the role and value of memorialization of colonial history and consider what poetry can offer in conversations about Indigenous history and reconciliation in North America.

INTRODUCTION

When contemplating the history of Indigenous-settler relations in North America, it is important to consider whose stories are privileged, and why. Recent works by Canadian settler poet Laurie D. Graham and Oglala Lakota poet Layli Long Soldier demonstrate in very different ways their remembrances of two similar stories of nineteenth-century colonial violence on either side of the Canada-US border. In her poems "Battleford Gravesite" and "Visiting Pîhtokahanapiwiyin's / Poundmaker's Grave" from her book *Settler Education* (2016), Graham writes about events that occurred at Frog Lake and Battleford, Saskatchewan in connection with the 1885 Northwest Resistance. She focuses on how the Cree people were starved, Chief Poundmaker was wrongfully arrested, and eight Indigenous men were hanged for their involvement in the Resistance. This hanging was the largest mass hanging in Canadian history. Long Soldier's poem "38" from her book *Whereas* (2017) focuses on how the Dakota people were also starved in the 1860s following the signing of a treaty, and how 38 men who participated in the subsequent Uprising were arrested, resulting in the largest mass hanging in American history. Both poets reflect on pertinent questions surrounding the memorialization of Indigenous histories, but Long Soldier ultimately takes her process of remembering further than Graham by suggesting that memorialization should consist of more than just the written word; memorialization should also involve embodied action. By looking at these two works, I will investigate the role, value, and method of memorializing colonial history.[1] These two poets ask us to question how and why memorials are made, and prompt us to think about what is and is not memorialized. I will also consider the role of authorial self-positioning with regard to memorialization. Ultimately, I will investigate the role of memorialization in a climate that remains colonial, and illustrate what poetry can—and cannot—offer these conversations about Indigenous history and reconciliation in North America.

LAURIE D. GRAHAM AND ACKNOWLEDGING UNCOMFORTABLE TRUTHS AS A SETTLER

It is first important to understand the details of the historical events addressed in these poems. On the Canadian side of the border, Laurie D. Graham writes about the 1885

[1] I am a Canadian settler of European background located in the Haldimand Tract, on the traditional territory of the Anishnaabe, Haudenosaunee, and Neutral peoples.

Published online
21 December 2021

Citation
Caley, S. (2021). Memorializing Indigenous History: A Comparative Study of Canadian Settler Poet Laurie D. Graham and Oglala Lakota Poet Layli Long Soldier. *CJUR*, *6*(2), 12-16.

Address correspondence to
cale6980@mylaurier.ca

Northwest Resistance in Saskatchewan, fought mainly by Métis and Plains nations in reaction to treaties that decreased their ability to govern their own lands (Beal and Macleod, 2019). In "Visiting Pîhtokahanapiwiyin's / Poundmaker's Grave," Graham writes about Cree Chief Poundmaker, who opposed the signing of Treaty 6 because he thought that the terms were unjust. After Poundmaker's people reluctantly signed the treaty and moved to a small reserve near Battleford, the Canadian government failed to provide the treaty's promised supplies and Poundmaker's people began to starve (Dempsey and Filice, 2019). Poundmaker is now known for attempting to negotiate peacefully, but because some members of his band participated—against his wishes—in revolts in Battleford and Batoche, he was arrested for treason and sent to prison (Graham, p. 111). It is believed that Poundmaker contracted tuberculosis during the time he served at Stony Mountain Penitentiary in Manitoba, and died shortly after his release (Dempsey and Filice, 2019).[2]

In "Battleford Gravesite," Graham discusses the 1885 hangings of six Cree and two Assiniboine men who, motivated by their growing desperation and starvation, participated in an invasion of the Frog Lake settler village in what was then known as the District of Saskatchewan. This revolt was led by Plains Cree Chief Big Bear's War Chief, Wandering Spirit (Pannekoek, 2016). Although Chief Big Bear, wanting to avoid violence, had also reluctantly signed Treaty 6, Wandering Spirit led his warriors to capture and kill nine settlers (Beal and Macleod, 2019). The Canadian government sentenced Wandering Spirit and seven of these warriors to death. Along with Poundmaker, Big Bear was sentenced to Stony Mountain Penitentiary for treason, and also had to be released due to failing health (Pannekoek, 2016).[3] He died not long thereafter.

Both Graham and Long Soldier challenge the ways in which these stories have been remembered by the settler-colonial histories of Canada and the United States. Most notable in Graham's poetry is her imagery of looping, which conveys the Canadian settler's difficulty in learning and reckoning with colonial history. For instance, circular imagery appears in the final line of "Visiting Poundmaker's Grave." After Graham's speaker has reflected on how to respect the gravesite, Graham writes: "There's a looping everywhere" (p. 57). This image is crucial both to this poem, as well as "Battleford Gravesite," because it introduces a recurring motif of bringing the events of the past into the present. In "Battleford Gravesite," Graham describes the town of Battleford, and juxtaposes present and past events that have happened there through specific images of recurrence. For example, she represents the 1885 hanging of the six Cree and two Assiniboine men through the image of "[t]he eight poles above the scrubline in your photo" (p. 49). With this line, she conjures an image of the past, but layers it onto a present view. The present perspective is also coming from a place of privilege, as the settler speaker is able to just stand in front of the poles and take a photo—there is no personal risk at stake. In the region of Battleford, which has both recently and historically been a site of racial tension and violence, there is an undeniable element of physical risk that does not threaten a white settler in the same ways that it might threaten an Indigenous person.[4] It is also significant that Graham directly addresses her reader by using the second person possessive pronoun "your," pulling the reader into assuming the position of the gazing settler. If the reader is a settler, this line should make them aware of both their ability to distance themselves from Indigenous history, and the ethical consequences of this distancing. Here, distancing works against the call to action that Daniel Heath Justice says is key to reckoning with the uncomfortable truths of colonialism, past and present (2018, p. 16). In Graham's case, she reckons with what it means to be a settler as a way to acknowledge this discomfort, but also as a way to recognize her privilege.

Further on in "Battleford Gravesite," Graham describes how the location of the eight men is "[b]eyond the fort site, behind the campsite, down in the valley overlooking ball fields, / angled at the river, away" (p. 49). These men are not memorialized at Fort Battleford or at the Frog Lake National Historic Site. They are quite literally tucked away, and mentioned only as the cause of the attack on the settler village. This lack of memorialization is something that Graham often struggles with in her work. She frequently notes a lack of signage in sites of colonial violence and trauma, such as when she is attempting to find Poundmaker's grave: "The signs are unreliable" (p. 55). This calls attention to how Graham was taught, as most settlers are, to think about our country's history as a line of progress that often does not take an Indigenous point of view into account. Thus, when the signs do not take Graham in the direction that she is used to, she does not know how to follow them. She calls direct attention to this uncertainty in "Battleford Gravesite" when visiting the site of the hangings, admonishing herself—and the reader—to "[s]how some respect and keep your distance. Though with no paved route, / no federal plaque, you don't know what respect is" (p. 49). Here, Graham explicitly contemplates the need for memorialization and how best to carry it out. She further explores settler ambivalence by suggesting that settlers feel that we should show respect by "keeping our distance," while simultaneously desiring a paved route to follow. Here, she presents two predominant ways in which Indigenous history is remembered by Canadian settlers: it is either distanced from us, or given to us as a prescribed way of remembering, a direct route to follow. Notably, neither of these methods of remembering involve a concrete interaction with Indigenous perspectives. At the Frog Lake National Historic Site, for instance, there is a plaque at the cemetery to commemorate the nine settlers who were killed. It lists all of the settlers' names and professions, but simply lists the Indigenous men as "rebels" ("Frog Lake National Historic Site," n.d.). The only Indigenous name the plaque mentions is Big Bear, the chief who was opposed to the attack. This original plaque does not even mention the hanging. There is a newer plaque that exists not at the National Historic Site, but on Fish Lake Road, in Frog Lake, Alberta, which acknowledges that the Cree people had been treated unfairly by the government; however, this plaque only mentions that six Cree men were hanged, and does not mention the two Assiniboine men. These two attempts at memorializing the 1885 events at Frog Lake are exactly what Graham's speaker is referring to when she says that we "don't know what respect is" (p. 49). How should one know how to respect these eight men when we are not even told their

[2] In May 2019, Prime Minister Justin Trudeau finally visited the Poundmaker Cree Nation near North Battleford to exonerate Chief Poundmaker's conviction of treason, which has been appreciated by his ancestors as a step towards reconciliation (Stefanovich, 2019).
[3] To date, Chief Big Bear has not been exonerated.
[4] Battleford, Saskatchewan is not only a historical site of violence for its significance in the 1885 Northwest Resistance, but it also has a recent history of violence against Indigenous peoples, as can be seen in the 2016 case of Colten Boushie (Hubbard, 2019).

names? In the face of this uncertainty, Graham looks up their names, and weaves them into her poem: "November 27, 1885, eight in the morning: Wandering Spirit, / Round the Sky, Bad Arrow, Miserable Man, Iron Body, Little Bear, / Crooked Leg, and Man Without Blood" (p. 53). This act of naming allows Graham to acknowledge that there are gaps in the history she has been taught, and that she must be open to learning what has been hidden by these memorials. However, while Graham's willingness to continue learning is important, her textual and linguistic form of memorialization can only go so far. Even when her speaker calls upon the reader to "sing their names out the window of your motel room" (p. 53), this performative linguistic act has questionable value if no one else will be there to listen, interact, and respond. In reading Graham's poetry alongside Long Soldier's, it becomes clear that forms of memorialization that are solely linguistic do not do enough of the work that needs to be done if reconciliation is to be engaged in seriously. Although reconciliation may seem like a desirable goal for settlers, much like linguistic forms of memorialization, it has limitations. This is because, as Jeff Corntassel argues, "[r]econciliation without meaningful restitution merely reinscribes the status quo without holding anyone accountable for ongoing injustices" (2012, p. 93). Reconciliation alone is a contested concept, because of its tendency to continue to serve colonial desires instead of Indigenous ones. This is why Leanne Betasamosake Simpson suggests Indigenous resurgence as a way of centering Indigenous experience in efforts of decolonization, because "[w]e cannot just think, write, or imagine our way to a decolonized future" (2017, p. 162). Therefore, Indigenous resurgence, as well as the memorialization of Indigenous histories, requires forms of embodied action.

LAYLI LONG SOLDIER AND EMBODIED ACTION AS INDIGENOUS RESILIENCE

This is where Layli Long Soldier's poem, "38," takes memorialization one step further by actively questioning the limits of language, and pushing remembrance to include embodied and community-based action. This poem tells the story of a group of 38 Dakota men who were hanged for their involvement in the 1862 Sioux Uprising in what is now known as Minnesota. Long Soldier explains that the Sioux Uprising occurred because the United States government did not deliver money as promised to the Dakota people in the Minnesota treaties. Because these treaties restricted the Dakota people's hunting land, the Dakota people experienced starvation, and thus resisted this unfair treatment.

In 2009, President Obama signed Senate Joint Resolution 14 of the 111th Congress, the United States' official apology to Native American peoples. This apology was presented privately, with no Native Americans present to receive it, and did not make major news headlines, as most people hardly even knew that it had happened (Diaz, 2017). Long Soldier has said that her 2017 book, Whereas, was written partly as a response to the delivery of this apology and its language, as she explained in a 2017 interview:

> *I read the apology, and then I was like, "Oh my gosh, the language—it's so careful." It's so carefully crafted. I mean, my goodness, these guys are poets. I mean, very astute and very aware of what each phrase—how do I say it—what each phrase may carry, the implication of each phrase. (Tippett, 2017)*

In response, Long Soldier's poem redeploys the formal wording of this apology to call attention to the limits of the language that often surrounds Indigenous history, and to explore how it can hide truth rather than confront the past with openness and honesty, ultimately allowing her to rewrite the history of the Dakota 38. In this poem, Long Soldier directly acknowledges that she is conforming to 'standard English' rules. At the same time, she exploits linguistic ambiguity to undermine the legitimacy of colonial 'sentencing.' She begins the poem by saying "Here, the sentence will be respected" (Long Soldier, 2017, p. 17). This line, with the idea of the "sentence," not only illustrates that she will be using the language of the settler government, but also calls attention to the sentencing of the Dakota 38. As readers, we are invited to contemplate which 'form' of the sentence deserves our respect: the grammatical form or the legal form. Long Soldier similarly expresses and at the same time disrupts governmental language later in the poem, writing "As treaties were abrogated (broken) and new treaties were drafted, one after another, the new treaties often referenced the old defunct treaties, and it is a muddy, switchback trail to follow" (p. 19). By writing the word "broken" in parentheses behind the word "abrogated," Long Soldier shows how legal terms deliberately obscure easy understanding, thus making it easier for the government to hide behind language and not fully reveal the truth of how their words will affect Indigenous lives. While Graham's personal reckoning with the gaps in the histories she has been taught as a settler demonstrates how colonial practices can obscure access to the past for everyone living in a colonial state, Long Soldier's purposeful deconstruction of government language as an Indigenous woman shows that these colonial practices continue to impact Indigenous lives today. The very fact that Long Soldier responds directly to the 2009 Obama apology in Whereas, while in "Battleford Gravesite" and "Visiting Poundmaker's Grave" Graham makes no mention of Prime Minister Harper's 2008 apology to residential school survivors, emphasizes how the continual colonial obscuring of truth carries a greater weight within Indigenous lived experiences.

Long Soldier also shows how colonial violence itself functions as a kind of government sentence over how Indigenous people will live and die. This is especially notable when she describes the starvation of the Dakota people in the 1860s: "Without money, store credit, or rights to hunt beyond their ten-mile tract of land, Dakota people began to starve. / The Dakota people were starving. / The Dakota people starved" (p. 20). Here, the poem outlines how the United States government made it impossible for the Dakota people to hunt or buy food, effectively "sentenc[ing]" them to starvation. This act makes clear that the government's ultimate goal was to rid the area of Indigenous people, no matter whether they were starved or hanged. The use of the different tenses of the verb "to starve" highlights how the government never intervened, even as the starvation progressed, resulting in the process reaching its willful completion. The words we choose to use when speaking about Indigenous history can be extremely revealing, as Long Soldier says, "Everything is in the language we use" (p. 19). Because of the trickiness of language that is exposed in this poem, Long Soldier suggests that memorialization and the address of Indigenous grievance should take more than a linguistic form, and also translate into physical actions.

As an example of a memorial action, Long Soldier cites the Dakota 38 + 2 Memorial Riders, supporters who ride horses from Lower Brule, South Dakota to Mankato, Minnesota every December to

honour the memory of the men who were hanged. She then returns to the past, looping back once again, to tell how a trader refused store credit to the starving Dakota by saying: "'If they are hungry, let them eat grass'" (p. 21). When the Dakota killed the trader during the Sioux Uprising, they filled his mouth with grass. Long Soldier says, "I am inclined to call this act by the Dakota warriors a poem" (p. 22). This further expands the notion of the poetic to include embodied responses to injustice. The response here takes two forms: that of Long Soldier's rewriting of colonial policies to clarify what is obscured, and that of reading the Dakota actions themselves as ones of political and poetic significance. Daniel Heath Justice writes about how Indigenous literatures come in many different forms besides words on paper, such that "it doesn't seem much of a stretch to think of our literary traditions as being broadly inclusive of all the ways we embody our stories in the world" (p. 22–23). In the instances of both the Dakota 38 + 2 Memorial Riders and the Dakota warriors, these actions create what we might think of as poems through their connection with lived experience, as well as their physical embodiment of important histories. The creative nature of these responses to conditions that threaten Indigenous resilience is articulated by Kyle Whyte in his idea of "collective continuance": "a society's capacity to self-determine how to adapt to change in ways that avoid reasonably preventable harms. Adaptive capacity is similar to what is often meant by the concept of social resilience" (2018, p. 131). It takes Long Soldier's eye for symbolism to draw out the significance of a physical, nonverbal action; thus, the written word and poetic action work together to address colonial histories. Ultimately, Long Soldier argues that the choice of language, and the interaction between that language and concrete actions of memorialization, is what matters for remembering and respecting Indigenous histories.

WHY THIS MATTERS TODAY

Though both of these works by Graham and Long Soldier discuss Indigenous histories of the nineteenth century, it is important to consider what their ideas about memorialization can tell us about how we should be acting in the present. Violence against Indigenous people continues to happen today, including in the region of Battleford, Saskatchewan, where Graham's poems are set. In 2016, Colten Boushie, a member of the Red Pheasant Cree Nation, was shot and killed after he and his friends drove onto Gerald Stanley's farm; an all-white jury found Stanley not guilty of second-degree murder (Quenneville, 2020). This event, along with ongoing issues such as the Missing and Murdered Indigenous Women crisis and the revealing of racism in the RCMP and Canadian healthcare systems, demonstrates how Indigenous people still face systemic racism in Canada and how Indigenous calls to recognize ongoing colonization are still not being heard or respected. Also, to recall Long Soldier, it is significant to note that Gerald Stanley's trial never made it to sentencing, in contrast to the hasty punishment meted out to the six Cree and two Assiniboine men in Saskatchewan, and the 38 Dakota men in North Dakota over a century earlier. Indigenous people also continue to experience dispossession and exploitation of their land, as seen in instances like the conflicts over the Dakota Access Pipeline at Standing Rock Indian Reservation and the Coastal GasLink pipeline in Wet'suwet'en traditional territory. In both of these cases, Indigenous land protectors opposed the construction of natural gas pipelines on their traditional lands and advocated against the devastating environmental effects of these projects. At Standing Rock, protestors faced "[m]ace, rubber bullets and other threats from law enforcement," as well as arrests and inhumane treatment in jails (Levin, 2016). And in Wet'suwet'en territory, the RCMP arrested protestors and enforced a court order against those blocking the construction site (Wright, 2020).

MOVING FORWARD TOGETHER

These brief examples of twenty-first century colonial violence show how Graham's and Long Soldier's ideas about memorialization are important not just when discussing the past, but also when participating in contemporary conversations of reconciliation. Current issues of Indigenous-settler relations may seem daunting to most settlers, and we might feel unsure as to what this relationship should look like. Graham's poetry shows how it is important to recognize this feeling and learn from it. We will not find all the answers to Indigenous-settler relations easily, but if we acknowledge our uncertainty without defensiveness, it gives us the room to stay open minded instead of remaining trapped in the same colonial ideology. It gives us the ability to actually listen to Indigenous people—like Long Soldier—who suggest that we must go further than Graham's acknowledgements, by using carefully chosen words in concert with meaningful actions to think about Indigenous history, and therefore also the present. This tandem approach can be unexpectedly liberatory for settlers in particular; for, approaching the past with humility enables a feeling which Yankton Sioux activist and politician Faith Spotted Eagle describes as "freedom from denial" (Wo Lakota, 2013). This approach need not create defensiveness or guilt in settlers, but rather allows us to feel a liberation in our relationship with the past, which Spotted Eagle explains is key to "[coming] together on common ground" (Wo Lakota, 2013). The way we memorialize the past matters because it ultimately informs the way we think about these same issues today. If we can change the way we think about and act on these issues now, as these poets ask us to, then perhaps we might be able to change the future for the better.

CONFLICTS OF INTERESTS

The author declares no conflicts of interest.

The author acknowledges that this research was conducted as part of a Research Assistant position under the supervision of Dr. Jenny Kerber, funded by an SSHRC grant and would like to express their gratitude for her guidance and mentorship throughout this opportunity.

REFERENCES

[1] Beal, B. & Macleod, R. (2019). North-West Rebellion. *The Canadian Encyclopedia*. https://www.thecanadianencyclopedia.ca/en/article/north-west-rebellion

[2] Corntassel, J. (2012). Re-envisioning resurgence: Indigenous pathways to decolonization and sustainable self-determination. Decolonization: Indigeneity, *Education & Society, 1*(1), 86–101.

[3] Dempsey, H. A. & Filice, M. (2019). Pitikwahanapiwiyin (Poundmaker). *The Canadian Encyclopedia*. https://www.thecanadianencyclopedia.ca/en/article/poundmaker

[4] Diaz, N. (2017, August 4). A Native American Poet Excavates the Language of Occupation. *The New York Times*. https://www.nytimes.com/2017/08/04/books/review/whereas-layli-long-soldier.html

[5] Frog Lake National Historic Site of Canada. (n.d.). *Parks Canada Directory of Federal Heritage Designations*. https://www.pc.gc.ca/apps/dfhd/page_nhs_eng.aspx?id=26&i=72620

[6] Graham, L. D. (2016). *Settler Education.* McClelland & Stewart.
[7] Hubbard, T. (Director). (2019). *nîpawistamâsowin: We Will Stand Up* [Film]. National Film Board of Canada.
[8] Justice, D. H. (2018). *Why Indigenous Literatures Matter.* Wilfrid Laurier University Press.
[9] Levin, S. (2016, November 3). Dakota Access pipeline: the who, what, and why of the Standing Rock protests. *The Guardian.* https://www.theguardian.com/us-news/2016/nov/03/north-dakota-access-oil-pipeline-protests-explainer
[10] Long Soldier, L. (2018). 38. In Heid E. Erdrich (Ed.), *New Poets of Native Nations* (p. 17–22). Graywolf Press.
[11] Pannekoek, F. (2016). Mistahimaskwa (Big Bear). *The Canadian Encyclopedia.* https://www.thecanadianencyclopedia.ca/en/article/big-bear
[12] Quenneville, G. (2020, February 2017). Online petition calling for inquiry into Colten Boushie shooting gets thousands of signatures. *CBC News.* https://www.cbc.ca/news/canada/saskatoon/petition-colten-boushie-petition-gerald-stanley-1.5464716
[13] Simpson, L. B. (2017). *As We Have Always Done: Indigenous Freedom Through Radical Resistance.* University of Minnesota Press.
[14] Stefanovich, O. (2019, May 7). Chief Poundmaker, wrongly convicted of treason-felony in 1885, to be exonerated by Trudeau. *CBC News.* https://www.cbc.ca/news/politics/chief-poundmaker-exoneration-1.5126471
[15] Tippett, K., host. (2017). *Layli Long Soldier – The Freedom of Real Apologies* [audio podcast]. On Being. https://onbeing.org/programs/layli-long-soldier-the-freedom-of-real-apologies-oct2018/
[16] Whyte, K. (2018). Settler Colonialism, Ecology, and Environmental Justice. *Environment and Society*, (9), 125–144. https://kylewhyte.cal.msu.edu/wp-content/uploads/sites/12/2019/02/2018-Whyte-Settler-Col-Ecology-EJ.pdf
[17] Wo Lakota. (2013, September 3). *Faith Spotted Eagle pt 3 Trauma & Resiliency - Essential Understanding #2* [Video]. YouTube. https://youtu.be/bqd_gYAhBII
[18] Wright, T. (2020, March 1). Caution, with a time limit: How Trudeau's patience with rail blockades ended. *The Toronto Star.* https://www.thestar.com/news/canada/2020/03/01/caution-with-a-time-limit-how-trudeaus-patience-with-rail-blockades-ended.html

Correlates of influenza vaccine uptake in persons with dementia in Canada

Emma Grant [1], Emma Bartfay [1]

[1] University of Ontario Institute of Technology, Oshawa, Ontario

Abstract As the Canadian population ages and rates of aging-related disorders increase, it is important to find medical interventions that promote health. Dementia is becoming an increasing concern among Canadians, accompanying an increased risk of all infections and a greater chance of adverse health effects following infection. This makes it incredibly important to ensure that persons with dementia are receiving a seasonal influenza vaccination. However, influenza vaccine uptake in persons with dementia remains below the recommended rate of vaccination. The current study examined how the presence of comorbidities may impact the rate of influenza vaccination among persons with dementia. Key comorbidities relating to dementia include Chronic Obstructive Pulmonary Disease (COPD), heart disease, diabetes, and high blood pressure. As influenza vaccination for dementia patients is an important protective factor, it is important to implement routine care that may increase vaccination rates. Data was drawn from the Canadian Community Health Survey (CCHS) 2015-2016 and the indirect measure of Cognitive status scored 4-6 was used to represent the dementia population. Information from 130 000 Canadians was available; however, only 418 Canadians met the cognitive status restrictions and were included in the study. Chi-squared tests were used to test variable relationships. The presence of heart disease and COPD were both associated with a significantly higher vaccination rate. However, the relation to routine care was insignificant. These findings are interesting, as it raises the question of why heart disease and COPD raised vaccination rates if not due to routine care. Continuing research with the dementia population is needed to find ways to promote protective vaccination such as the seasonal flu shot.

INTRODUCTION

Dementia is of growing concern in Canada and worldwide. By 2031, it is expected that the number of Canadians living with dementia will exceed 1.4 million (Boscart et al., 2019). This represents a significant burden not only on the healthcare system, but on social support systems and the caregivers they depend upon (Boscart et al., 2019). It is important to find ways to reduce the impact of dementia on the healthcare system and caregivers by promoting the wellbeing of persons living with dementia, particularly older adults that are more likely to have fragile health.

Influenza is a common seasonal illness that causes over 12 000 hospitalizations and 3500 deaths each year. It is ranked among the top ten leading causes of death in Canada (Government of Canada [GOC], 2019). Globally, the number of influenza infections can exceed 1 billion cases a year (GOC, 2019). With the high prevalence of this infection, it is important to focus on preventative measures. While most individuals can recover easily from this virus, there are certain populations at high risk for serious complications. An influenza infection is much more likely to result in mortality and morbidity in older adults compared to younger adults, especially when there are comorbid illnesses present (Andrew et al., 2004). Increased severity of influenza infection is compounded when other illnesses or comorbidities are present. Older adults affected by dementia are at an even greater risk. Dementia is a factor in contracting the influenza virus and increasing the prevalence of associative illnesses (Gallini et al., 2017). This is due both to aging, which itself reduces immune function and increases the occurrence of comorbidities, as well as dementia, which likely can lead to inflammation that may impact the immune system (Kipnis et al., 2008). It has recently been acknowledged that neither the cognitive nor the immune system can function optimally without the other (Kipnis et al., 2008). This explains the risk that influenza infections pose to not only older adults with comorbidities, but especially to persons with dementia. However, there is one major preventative intervention: vaccination.

Published online
21 December 2021

Citation
Grant, E., & Bartfay, E. (2021). Correlates of influenza vaccine uptake in persons with dementia in Canada. *CJUR*, *6*(2), 17-21.

Address correspondence to Emma Grant at emma.grant2@ontariotechu.net

The seasonal influenza vaccine is the first line of defense against influenza. Current Canadian guidelines recommend that all people over 65 years old, and all residents in Long Term Care Facilities, receive the vaccination yearly (Andrew et al., 2004). Further recommendations strongly advise that those with dementia receive the vaccination yearly (Gallini et al., 2017). Due to the low risk of adverse health effects following vaccination, it is a low burden intervention that can dramatically reduce the possibility of morbidity and mortality caused by influenza. (Gallini et al., 2017). Rates of vaccination are even used to assess the accessibility of primary care prevention services (Shah et al., 2011). This is because receipt of the yearly vaccines imply access to primary care, as primary care facilities are likely where the vaccine is being received or recommended to patients.

Despite strong recommendations and guidelines for annual influenza vaccination, coverage remains inconsistent. Older adults with a dementia diagnosis are among one of the greatest at-risk populations, yet have some of the lowest vaccination rates (Gallini et al, 2017). Older adults with dementia living outside of care facilities have significantly lower rates of vaccination when compared to both older adults that are fully mentally capable as well as dementia patients living in care facilities (Gallini et al., 2017). This may reflect difficulty accessing vaccination in the community as well as the much easier access in care homes. It has even been suggested that older adults following a serious diagnosis, such as dementia, may lose interest in preventative measures, knowing their health will deteriorate regardless of prevention methods (Martinez-Baz et al., 2012). This was reflected in a study by Martinez-Baz et al. (2012) that showed that dementia patients had lower adherence to vaccination following their diagnosis compared to prior their diagnosis.

Other trends among older adults also presented themselves in the study. Older adults that had more frequent visits to their primary care physician were more likely to have received the vaccine (Martinez-Baz et al., 2012). This could be due to several factors such as increased awareness, greater access to the vaccine while at the clinic, and more opportunities for physicians to recommend vaccination (Martinez-Baz et al., 2012).

An increase in vaccination has also been seen with the presence of comorbidities in other studies. On average, persons with dementia have an additional 2-8 comorbidities that complicate dementia treatment and reduce overall health and quality of life (Ting-Bin, 2017). People, especially older adults with low perceived health, that have diagnosed comorbidities and chronic diseases have been found to require more consistent and frequent healthcare visits (Zhang et al., 2019). When contact with healthcare professionals is higher, there is greater opportunity to receive a vaccination.

Self-perceived health has been shown to be a major indicator of vaccination. Those with lower self-perceived health have been more likely to get vaccinated (Chen et al., 2007). A decrease in self-perceived health could be linked to a greater number or severity of comorbidities (Chen et al., 2007). People that receive the vaccination are more likely to have more significant health problems and more diagnosed comorbidities (Andrew et al., 2004). Patients with comorbidities such as chronic respiratory disease, heart disease, diabetes, and stroke, as well as patients with more medication prescriptions and a greater number of visits to both nurses and physicians all had higher vaccination coverage (Gallini et al., 2017).

While a dementia diagnosis is most often associated with lower influenza vaccination rates, dementia patients with more comorbidities were more likely to receive the vaccine. This interaction is interesting because it is conceivable that treating dementia like other comorbidities, in requirement of medical checkups, may help to increase overall vaccination rates. The influenza vaccine is a vital tool in the preservation of health and quality of life among both persons living with dementia and those with comorbidities; as such, it is important to understand the trends in vaccination rates.

For the current study, we used data from the Canadian Community Health Survey. The Health Utility Index for cognition was used to determine the presence of dementia. Dementia has one of the greatest effects on cognitive scores (Guertin et al., 2018). A cognitive classification of 4, wherein a patient reports a little difficulty with daily tasks, to 6, wherein a patient is unable to think or solve daily problems, were considered within the range of dementia (Horsman, 2003).

The main research question explored if the presence of comorbidities impacted the rate of influenza vaccination among persons with dementia. Specifically, comorbidity with Chronic Obstructive Pulmonary Disease (COPD), heart disease, diabetes, or high blood pressure was investigated. These comorbidities were selected as they are associated with increased rate of influenza vaccination (Gallini et al., 2017; Chen et al., 2007). The second research focus tested if required routine medical care impacted the rate of influenza vaccination. The final question was if comorbidities increased the likelihood of routine medical care.

It was hypothesized that persons with dementia and a comorbidity, particularly COPD, heart disease, diabetes, or high blood pressure, would show a greater likelihood of vaccination due to increased contact with the healthcare system when compared to persons with dementia that do not have a comorbidity. Furthermore, it was hypothesized that the presence of COPD, heart disease, diabetes, or high blood pressure in persons with dementia would increase the likelihood of requiring routine medical care when compared to persons with dementia that do not have a comorbidity. The final hypothesis was that the requirement for routine medical care would increase influenza vaccination rates for persons with dementia when compared to persons with dementia that do not require routine medical care.

METHODS

Data Source: Canadian Community Health Survey 2015-2016

This study used secondary data collected from the Canadian Community Health Survey 2015-2016 (CCHS). The CCHS takes a sample of 130 000 Canadians from all provinces and territories every 2 years. Data collection occurred via in-person interviews with members of randomly selected households. Phone interviews were also conducted with randomly generated phone numbers. Both methods used banked data as well as stratification to ensure selection was random but representative of each province and territory, as well as the different regions within them. The CCHS was chosen for this study as it had accessible secondary

information; this project had a limited time frame that did not allow for primary data collection.

Case Definition

This study focused on persons with dementia. For this study, the Health Utility Index's category of cognitive health with a score of 4-6 was used to represent persons with dementia. Scoring in this range results in experiencing a little difficulty to a total inability to solve daily problems and complete daily tasks. The health utilities index was chosen as there was no option for self-reported dementia in the 2015-2016 CCHS, and cognitive status was most likely to accurately represent persons with dementia.

Variables

Several variables were included in the analysis. The presence of comorbidities was measured by asking respondents if they have the diagnosis in question, with a yes or no answer. The first question asked if respondents had COPD, which is used as an umbrella diagnosis including chronic bronchitis, emphysema, or chronic obstructive pulmonary disease. Participants were asked if they had heart disease, diabetes, or high blood pressure. Another measure under investigation is the requirement for routine care. Respondents were asked if they had required routine or ongoing care within the last 12 months. Routine care includes physicals, check-ups, bloodwork, and routine care for ongoing conditions (Clarke, 2016). The main variable was the receipt of a seasonal flu shot. Respondents were asked when they had last received a flu shot. Possible answers included less than one year ago, one year to less than two years ago, and over two years ago. A yes response was indicated if a flu shot had been received within one year (less than one year ago), and a no response was indicated if the response was one year to less than two years ago or over two years ago.

Analysis

SPSS Statistics 26 was used for data management and analysis. The Chi-squared test of independence was used to test for a relationship between the presence of comorbidities and flu vaccination, between required routine care and flu vaccination, and between comorbidities and required routine medical care.

RESULTS

The Canadian Community Health Survey reports on cognitive health status from level 1 to 6. A total of 418 respondents had a cognitive health status between 4 and 6. Survey responses were drawn from these 418 respondents. Limited socio-demographic data was available through the CCHS; however, 72% of respondents identified as aboriginal or first nations, 95% of respondents were born in Canada, and 64% had been in Canada for at least 10 years.

Cognitive Health Score, Comorbidities, and Influenza Vaccine

Table 1 displays the data of those who received the seasonal influenza vaccine within the last 12 months and their comorbidities. The chi-square test for COPD had a p value = 0.02 and, for heart disease, p=0.045. This suggests that there is a significant relationship between the presence of COPD and heart disease and receiving the influenza vaccination. Diabetes and high blood pressure had a p value > 0.05. For COPD, 90% of persons with dementia and COPD received the flu shot within the last year, and only 53% of those without COPD received the vaccine. 80% of participants with heart disease had received the vaccine within the year, with only 47.8% of those who reported not having heart disease did. While statistically insignificant, diabetes followed a similar trend, with 65% of participants with diabetes having received the shot within the year, while 48% of those without diabetes did. 50% of participants that reported having high blood pressure had also received the flu shot within the year, compared to 48% without high blood pressure.

Table 1 Presence of COPD, heart disease, diabetes, and high blood pressure with seasonal influenza vaccine within the last 12 months. Starred variables were statistically significant.

	Received seasonal influenza vaccine within the last 12 months		
Has COPD*	**Yes**	**No**	**Total**
Yes	9 (90%)	1	10
No	53 (53%)	47	100
Total	62	48	110
Has heart disease*	**Yes**	**No**	**Total**
Yes	8 (80%)	2	10
No	113 (48%)	124	237
Total	121	126	262
Has diabetes	**Yes**	**No**	**Total**
Yes	11 (65%)	6	17
No	110 (48%)	121	231
Total	121	127	248
Has high blood pressure	**Yes**	**No**	**Total**
Yes	23 (50%)	23	46
No	95 (48%)	102	197
Total	118	125	243

Table 2 Requirement of routine medical care and reception of seasonal influenza vaccine within the last 12 months.

	Received routine medical care within 12 months		
Received seasonal influenza vaccine within 12 months	**Yes**	**No**	**Total**
Yes	18 (50%)	18	36 (54%)
No	15 (50%)	15	30
Total	33	33	66

Required Routine Care and Influenza Vaccine Last Time

The relationship between required routine care within the last 12 months and influenza vaccination within the last 12 months was also statistically insignificant, with a p value > 0.05, regardless of the requirement for routine care. 54% of those with dementia had received the vaccination within 12 months (Table 2).

Comorbidities and Required Routine Care

The relationship between the presence of comorbidities and routine care was insignificant for all four comorbidities (p>0.05). 83% of people that reported having COPD had also required routine care, compared to 54% who did not have COPD. Of the people that reported having heart disease, 67% required routine care, and only 51% of those that reported not having heart disease required routine care. 38% of those that reported having diabetes also reported having required routine care, and 53% of those that reported not having diabetes had required routine care. 43% of

Table 3 Presence of COPD, heart disease, diabetes, and high blood pressure with requirement for routine medical care within the last 12 months.

	Required routine medical care within the last 12 months		
Has COPD	Yes	No	Total
Yes	5 (83%)	1	6
No	25 (54%)	21	46
Total	30	22	52
Has heart disease	Yes	No	Total
Yes	4 (67%)	2	6
No	48 (51%)	46	94
Total	52	48	100
Has diabetes	Yes	No	Total
Yes	3 (38%)	5	8
No	49 (53%)	43	92
Total	52	48	100
Has high blood pressure	Yes	No	Total
Yes	10 (43%)	13	23
No	42 (57%)	32	74
Total	52	45	97

people that reported high blood pressure had required routine care in the last year, compared to the 57% of people that reported not having high blood pressure but requiring routine care within the year (Table 3).

DISCUSSION

It was found that some comorbidities correlated with the rate of seasonal flu shot receipt more than others. COPD and heart disease both had a significant impact on the uptake of flu shots among persons with dementia. This is consistent with other research that has found a relationship between the presence of comorbidities, including heart disease and chronic respiratory diseases, and increased vaccination (Gallini et al., 2017). This suggests that not only can the presence of comorbidities impact vaccination rates, but that some comorbidities may have more of an impact than others.

However, there was no significant impact of required routine care on vaccination rates or of comorbidities on the requirement for routine care. In previous research, there was a positive correlation between routine care and vaccination as well as the presence of comorbidities and the requirement for routine care (Martinez-Baz et al., 2012; Zhang et al., 2019). The difference in findings may be due to data collection methods, as this research was not conducted in a clinic; however, further exploration is required. It is important to explore why routine care is not a factor, as clinics are an important site for vaccination and vaccine encouragement. Overall, while some comorbidities impact vaccination rates, it is not clear why this pattern emerged. This suggests a need to further investigate why comorbidities may impact vaccination rates among persons with dementia, if not due to increased contact with the healthcare system.

Only 418 of 130 000 respondents reported a cognitive health score of 4 to 6, representing a significant drop in respondents. It is not clear if there is a lack of support for people with lower cognitive function to participate in community surveys or possibly if people are unaware of their cognitive health score. The CCHS cognitive health status was an indirect measure of the impact of dementia, rather than a diagnosis. However, it was the closest measure available that would capture persons with dementia. This indirect measure would likely result in underreporting of dementia if people were unsure of their cognitive status score. It could have also included individuals without dementia that had other cognitive impairments. It would likely be beneficial to consider reporting dementia and other cognitive diseases by their diagnosis in order to improve ease of use. Self-reported data such as the CCHS is important, although it may be inaccessible for persons with dementia, especially those with more severe cognitive scores. Individuals with low cognitive scores still possess perspectives that are valuable for understanding health within this population. Furthermore, they may experience increased health-related issues and require more care. Promoting the participation of those with cognitive diseases and dementia can help to better understand their health situation and what can be done to ensure that they are able to access influenza vaccination. The chi-square test of independence was used, and since this was an exploratory investigation into associations, no further data analysis was completed. Multivariant analysis was not completed as the goal was to identify differences between access to the medical system and different comorbidities.

The implication of these findings is important. Further research into this is needed to determine not only what factors are impacting vaccination rates among the comorbid, but why some comorbidities impact vaccination rates more and what can be done to ensure that those at risk are receiving the influenza vaccination. Since those with dementia and old age, in general, are major targets for vaccination due to the increased likelihood of adverse health effects following infection, it is vital to understand why their rates remain so low.

CONFLICTS OF INTERESTS

The authors declare no conflicts of interest.

REFERENCES

[1] Andrew, M.K., McNeil, S., Merry, H., & Rockwood, K (2004). Rates of influenza vaccination in older adults and factors associated with vaccine use: A secondary analysis of the Canadian Study of Health and Aging. *BMC Public Health, 4*(36). doi:10.1186/1471-2458-4-36

[2] Boscart, V.M., McNeill. S., & Grinspun, D. (2019). Dementia Care in Canada: Nursing Recommendations. *Canadian Journal on Aging, 38*(3), 407-418.

[3] Chen, Y., Yi, Q.L., Wu, J., & Li, F. (2007). Chronic disease status, self-perceived health and hospital admissions are important predictors for having a flu shot in Canada. *Vaccine, 25*(42), 7436-7440. doi:10.1016/j.vaccine.2007.08.003

[4] Clarke, J. (2016). *Health at a Glance: Difficulty accessing health care services in Canada.* Symbols of Statistics Canada. Retrieved from https://www150.statcan.gc.ca/n1/pub/82-624-x/2016001/article/14683-eng.htm

[5] Gallini, A., Coley, N., Andrieu, S., Lapeyre-Mestre, M. & Gardette, V. (2017). Effect of dementia on receipt of influenza vaccine: a cohort study in French older adults using administrative data: 2007-2012. *Fundamental and Clinical Pharmacology, 31*(4). doi:10.1111/fcp/12281

[6] Government of Canada (2019). *Flu (influenza): For health professionals. Diseases and Conditions.* Retrieved from https://www.canada.ca/en/public-health/services/diseases/flu-influenza/health-professionals.html

[7] Guertin, J.R., Humphries, B., Feeny, D., & Tarride, J.E. (2018). *Health Utilities Index Mark 3 Scores for Major Chronic Conditions: Population Norms for Canada Based on the 2013 and 2014 Canadian Community Health Survey*. Health Reports Statistics Canada. Retrieved from https://www150.statcan.gc.ca/n1/pub/82-003-x/2018011/article/00001-eng.htm

[8] Horsman, J., Furlong, W., Feeny, D., & Torrance, G. (2003). The Health Utilities Index (HUI): concepts, measurement properties and applications. *Health Quality Life Outcomes, 1*(54). doi:10.1186/1477-7525-1-54

[9] Kipinis, J., Derecki, N.C., Yang, C., & Scrable, H. (2008). Immunity and cognition: what do age-related dementia, HIV- dementia and 'chemobrain' have in common? *Trends in Immunology, 29*(10), 455-463. doi:10.1016/j.it.2008.07.007

[10] Martinez-Baz, I., Aguilar, I., Moran, J., Albeniz, E., Aldaz, P., & Castilla, J. (2012). Factors associated with continued adherence to influenza vaccination in the elderly. *Preventive Medicine, 55*(3), 246-250. doi:10.1016/j.ypmed.2012.06.020

[11] Shah, S.M., Carey, I.M., Harris, T., DeWilde, S., & Cook, D.G. (2011). The impact of dementia on influenza vaccination uptake in community and care home residents. *Age and Ageing, 41*(1), 64-69. doi:10.1093/ageing/afr135

[12] Statistics Canada. *Canadian Community Health Survey, 2015-2016: Annual Component* [Public use microdata file] Ottawa, Ontario: Health Statistics Division, Statistics Canada [producer] Ottawa, Ontario: Data Liberation Initiative, Statistics Canada [distributor]

[13] Ting-Bin, C., Szu-Yu Yiao, Sun, Y., Huey-Jane, L., Shu-Chien, Y., Ming-Jang, C., . . . Pei-Ning, W. (2017). Comorbidity and dementia: A nationwide survey in Taiwan. *PLoS One, 12*(4). doi:10.1371/journal.pone.0175475

[14] Zhang, T., Chaojie, L., & Ni, Z. (2019). Association of Access to Healthcare with Self-Assessed Health and Quality of Life among Older Adults with Chronic Disease in China: Urban Versus Rural Populations. *Int. J. Environ. Res. Public Health, 16*(4), 2592. doi:10.3390/ijerph16142592

Evaluation of Mixed-Media Education Sessions on Nurses' Knowledge and Confidence in Caring for Patients on Clozapine

Brooke K. Gessner [1], Rohit Lodhi [2], Katelyn Halpape [1]

[1] College of Pharmacy and Nutrition, University of Saskatchewan, Saskatoon, Saskatchewan

[2] Department of Psychiatry, College of Medicine, University of Saskatchewan, Saskatoon, Saskatchewan

Abstract **Introduction**: Clozapine is the most effective antipsychotic drug and the only approved pharmacotherapy for treatment-resistant schizophrenia. Despite this, there are many barriers to its use, including life-threatening adverse effects such as agranulocytosis and myocarditis. Another barrier is a lack of health professional confidence and knowledge related to clozapine, which may stem from inadequate or limited clozapine-related training. A standardized, evidence-based protocol to care for patients on clozapine may improve healthcare providers' knowledge and confidence when caring for patients on clozapine. A clozapine Clinical Toolkit (CTK) was developed and implemented in Vancouver, British Columbia, and, with permission, was adapted for use at the Dubé Centre for Mental Health (DCMH). Prior to the CTK being used by nursing staff at the DCMH, small group education sessions were held to assess nurse's current knowledge and confidence regarding clozapine, as well as to provide education on clozapine and the CTK. The education sessions used components of the CTK to assist in educating nursing staff on clozapine. The objective of this study was to determine the impact of the education sessions on nurses' confidence and knowledge related to clozapine.

Methods: Groups of one to five nurses at the DCMH were provided mixed-media education sessions on clozapine. Sessions were led by one or two researchers and lasted between 15 to 20 minutes. Pre- and post-education questionnaires were administered to assess nurses' knowledge and confidence related to clozapine. Questionnaire completion was voluntary and anonymous. The results were analyzed using simple summary statistics.

Results & Conclusion: The pre-education questionnaire was completed by 81 nurses, and the post-education questionnaire was completed by 80 nurses. The small group, mixed-media education sessions improved nursing knowledge on three out of five clozapine knowledge-based questions, and overall enhanced nurses' self-reported confidence related to clozapine.

Published online
21 December 2021

Citation
Gessner, B. K., Lodhi, R., & Halpape, K. (2021). Evaluation of Mixed-Media Education Sessions on Nurses' Knowledge and Confidence in Caring for Patients on Clozapine. *CJUR*, *6*(2), 22-26.

Address correspondence to Brooke Gessner at Brooke.gessner@usask.ca

INTRODUCTION

Clozapine: Gold Standard Pharmacotherapy for Treatment-Resistant Schizophrenia

Clozapine is classified as a second-generation or atypical antipsychotic, and—when compared to other antipsychotics in the treatment of schizophrenia—has consistently demonstrated superior efficacy (Leucht et al., 2013, Warnez et al., 2014). Although its exact mechanism of action is unknown, clozapine is postulated to have broad receptor activity on D2, D4, 5-HT2A, α1, and M1 receptors (Nucifora et al., 2017). The extensive receptor interactions of clozapine may explain its superiority over other antipsychotics. However, these vast receptor interactions also lead to several serious adverse drug effects, including agranulocytosis, myocarditis, and constipation, all of which require detailed clinical monitoring to reduce the risk of patient harm (De Berardis et al., 2018). Due to the potential severity of these adverse effects, clozapine use is primarily reserved for treatment-resistant schizophrenia (TRS); notably, it is the only antipsychotic approved by Health Canada for TRS (Remington et al., 2017, Government of Canada, 2015). As approximately 20-30% of individuals diagnosed with schizophrenia will develop TRS (Remington et al., 2016, Nucifora et al., 2019, Warnez et al., 2014), clozapine use is not infrequent; healthcare professionals, including nurses, require appropriate education, training, and treatment protocols to provide optimal care for patients on clozapine.

Health Professionals' Perceptions of Clozapine

Currently in Canada, there are no standardized guidelines on how to optimally monitor pa-

tients on clozapine, other than Health Canada-mandated hematological monitoring for agranulocytosis (Government of Canada, 2015). Due to ambiguity in how to best monitor for the other serious clozapine-related adverse effects, healthcare providers may lack confidence in optimally caring for patients on clozapine. This lack of understanding may further cause healthcare providers to fear clozapine and regard it as dangerous, which may alter their ability to inform, treat, and monitor patients adequately (Farooq et al., 2019, De Hert et al., 2016). This lack of understanding may stem from inadequate clozapine-related education (Farooq et al., 2019). For example, a study that assessed the clozapine knowledge of psychiatric nurses found that only one in four nurses achieved an overall score of 50% or higher on a clozapine-adverse drug effect questionnaire (De Hert et al., 2016). Additionally, only 15% of nurses correctly answered a question regarding the clinical presentation of agranulocytosis, and 24% of nurses reported that they did not receive adequate clozapine information during their nursing training (De Hert et al., 2016). Evidently, there is a critical need for nursing education, standardized monitoring guidelines, and clinical tools to assist with the safe and effective use of clozapine.

Clozapine Clinical Toolkit: Development, Adaptation, and Education

To address this healthcare gap, an interdisciplinary healthcare team in Vancouver, British Columbia successfully developed and implemented a clozapine Clinical Toolkit (CTK) (manuscript currently under review). Permission was obtained to adapt and implement this CTK at the Dubé Centre for Mental Health (DCMH) in Saskatoon, Saskatchewan. The CTK is comprised of several individual components (Appendix A), including pharmacy and nursing work standards, a preprinted order set, interdisciplinary guidelines, a nursing monitoring flow sheet, a clozapine discharge communication form, and patient/caregiver clozapine education handouts. In its entirety, the clozapine CTK provides a structured, evidence-based process and clinical supports for optimal inpatient clozapine use. When planning for the implementation of the CTK it was seen to have substantially altered the DCMH nursing staff's roles and responsibilities in caring for patients on clozapine. Thus, in anticipation of the CTK implementation, clinical supports related to the CTK were made available to the DCMH nursing staff at the point of care areas and on an online learning platform. Additionally, small group, mixed-media education sessions on clozapine were held. These sessions included a detailed overview of clozapine, an update on best-practice standards when caring for patients on clozapine, and a review of the CTK. Although the CTK is a separate entity from the education sessions, the clinical supports and other components of the CTK were utilized during the education sessions as teaching tools. The purpose of this study was to assess the impact of the clozapine education sessions on nurses' confidence and knowledge related to clozapine, as well as to obtain feedback from nursing staff regarding the education sessions and accompanying educational materials for ongoing quality improvement.

METHODS

Study Setting and Participants

All DCMH nursing staff members were invited to participate in this in-person study. The DCMH employs approximately 200 nurses. Due to the short window of time available to conduct the education sessions, it was determined that approximately half of the nurses would be offered the opportunity to participate in the study. Participation was voluntary, and the timing of the sessions was flexible to ensure that patient care was not negatively impacted. The study was conducted through numerous individualized small group mixed-media education sessions. Various types of educational materials and methods were employed during the education sessions, including handouts, a poster board, clinical tools, a didactic lecture, and small group discussions. The sessions took place in a meeting room on the psychiatry ward, with one to five nurses in attendance per session. The education sessions ranged from 15-20 minutes, and included detailed medication information on clozapine including efficacy and safety data. This was followed by the employment of specific elements of the CTK—for example, new nursing monitoring flow sheet and preprinted orders—to discuss optimal monitoring required for patients on clozapine. The sessions concluded with a discussion of CTK-related point of care resources available to nursing staff for ongoing education and clinical support. Session frequency varied, but on average, two sessions were offered each afternoon approximately three to four times per week for eight weeks throughout July and August 2020. Occasionally, sessions were held in the evening to target nursing staff that strictly worked night shifts. Each session was taught by one to two researchers—either a clinical nurse educator, pharmacy student, or nursing student—with the pharmacy student teaching most sessions. During each session, a checklist and standardized script was used by the researcher(s) to ensure that identical information was provided at each session.

Pre- and Post- Education Surveys: Self-Reported Confidence and Knowledge

Prior to the individualized education sessions on clozapine, nursing staff were asked to complete a pre-education questionnaire. The questions were designed specifically for DCMH nursing staff, and were crafted to allow nurses to adequately self-report their knowledge of clozapine best practice standards and their confidence in caring for patients on clozapine. Part one of the questionnaire consisted of five knowledge-based questions (Table 1). Part two of the questionnaire included three confidence-related statements (Table 2), where nurses were instructed to rate their confidence level on a numerical scale. The post-education questionnaire had identical knowledge and confidence-based questions to the pre-education questionnaire, with the addition of two open-ended questions.

Ethical Considerations

Ethics approval was granted by the University of Saskatchewan Behavioural Research Ethics Board (Beh-REB). Participants were made aware that their involvement was voluntary and that results of the study would be presented anonymously and in aggregate.

Data Management and Analysis

Participants were instructed to avoid writing any identifying information on both the pre- and post-education questionnaires; therefore, all survey data was anonymous. After completion of the questionnaires, participants placed their forms into designated manilla envelopes. There was one envelope for pre-education questionnaires and one for post-education questionnaires. The same envelopes were utilized throughout the study period to collect and store the completed questionnaires. The completed questionnaires were stored in a locked drawer in a locked office, and will continue to be stored for ten years as required by the Beh-REB.

Table 1 Survey Responses – Knowledge-Based Questions Answered Correctly

Knowledge question	Pre-education	Post-education
1. Patients on clozapine must have CRP and troponin checked weekly to monitor for agranulocytosis	48%	41%
2. Signs and symptoms of myocarditis include which of the following: (select all that apply) -peripheral edema -jaundice -chest pain -fever and fatigue -dyspnea	78%	91%
3. Clozapine treatment can cause severe neutropenia, which can lead to serious infections and death	96%	99%
4. Clozapine can cause serious constipation, which can lead to death	50%	98%
5. Agranulocytosis and myocarditis from clozapine can occur anytime during clozapine treatment	99%	96%

Table 2 Survey Responses – Confidence-Based Questions

Confidence question	Responses	Pre-education	Post-education
I am confident that I know where to find evidence-based information to improve my understanding of clozapine	Left blank	1%	/
	Strongly Disagree/Disagree	15%	/
	Undecided	27%	5%
	Strongly Agree/Agree	57%	95%
I am confident that I am developing and obtaining the knowledge to optimize the care of patients on clozapine	Left blank	1%	/
	Strongly Disagree/Disagree	8%	/
	Undecided	21%	4%
	Strongly Agree/Agree	70%	96%
I am confident that I can effectively discuss the benefits and risks of clozapine with patients	Left blank	1%	/
	Strongly Disagree/Disagree	12%	1%
	Undecided	36%	11%
	Strongly Agree/Agree	51%	88%

All questionnaire results were entered into Microsoft Excel in an anonymous manner, and were analyzed using simple summary statistics.

RESULTS

Survey Completion

The pre-education questionnaire was completed by 81 nurses, the post-education questionnaire was completed by 80 nurses.

Knowledge-Based Questions

On the pre-education questionnaire, the average for correctly answered knowledge-based questions was 74%; following education the average increased to 85%. Question #1 and question #5 both accompanied a slight decrease in nursing knowledge after the education sessions by 7% and 3%, respectively. The other three questions, #2, #3, and #4, saw an increase in knowledge after the education sessions by 13%, 3%, and 48%, respectively, as indicated in Table 1.

Confidence-Based Questions

Nurses' confidence in caring for patients on clozapine increased on all three confidence-based questions, as indicated in Table 2.

Open-Ended Questions and Verbal Feedback

For the open-ended portion of the post-questionnaire, we asked "What additional information would you like to learn about clozapine?" and also provided a blank space for comments on the education session. The major themes identified through these questions were: 1) nurses wanted to learn more about clozapine-induced cardiovascular adverse drug effects, 2) how to monitor for them, and 3) how clozapine compares to other antipsychotics in terms of these side effects. Participants stated that they found all the materials presented to be very user-friendly and efficient. They appreciated the addition of numerous clozapine-related clinical resources. Several participants mentioned that the education sessions were extremely informative, clarified many questions, and increased their knowledge of clozapine. These themes are visualized in Figure 1.

DISCUSSION

Limited information is available to guide the most effective strategy for educating practicing nurses, and the same is true regarding clozapine. However, evidence suggests that practical, empowered education strategies can be effective in increasing nurses' competency and professional skills (Chaghari et al., 2017). For this reason, that is the strategy that was employed during the small group mixed-media education sessions for the DCMH nursing staff.

Questions #1 and #5 in the knowledge-based section showed a decrease in knowledge after the education sessions. This result was unanticipated, as the information required to answer the questions correctly was included in the script utilized by the researchers when leading the education sessions. It is possible that these questions were misinterpreted by nursing staff due to a lack of question validation. Question validation requires researchers to test their drafted questions on individuals similar to those who will participate in the study, in order to establish question dependability. Unfortunately, time constraints did not allow for this process to occur, and this could have impacted the nurses' interpretation of the questions. Additionally, Questions #1 and #5 were two of the more complex therapeutic questions, which may highlight a need to incorporate case-based exercises to assess deeper understanding during future nursing education sessions.

Question #4 in the knowledge-based section focused on the mortality associated with clozapine-induced constipation and showed the largest improvement in nursing knowledge following the education sessions. Clozapine-associated constipation is an often overlooked and undervalued clozapine-induced adverse drug effect, despite the fact that the mortality rate is three times higher than that of agranulocytosis (Fowler, 2011). Moreover, constipation occurs more frequently, with gastrointestinal hypomotility occurring in roughly 32% of patients on clozapine compared to agranulocytosis and myocarditis occurring in 0.8-2% and 3% of patients, respectively (Cohen, 2017, De Berardis et al., 2018, Higgins et al., 2019). To address the prevalence of clozapine-induced constipation, a proactive bowel protocol and associated monitoring parameters were included in the CTK. These components of the CTK were utilized as education tools when providing the educa-

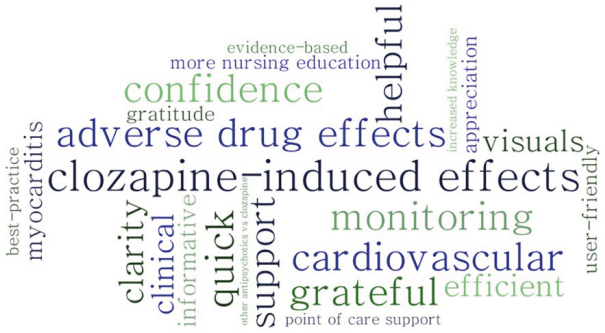


Figure 1 Nursing Themes Identified Regarding the Mixed-Media Education Sessions

tion sessions on clozapine, and as such, extensive education on clozapine-induced constipation was provided during the education sessions. Thus, it was not surprising that while only 50% of nurses answered question #4 correctly prior to the education sessions, 98% of nurses answered correctly on the post-education questionnaire. The mixed-media approach used to educate nurses was designed with the intention to help monitor and mitigate clozapine-related adverse drug effects through standardized, evidence-based monitoring. Ultimately, this approach—aimed to improve nursing knowledge and confidence through empowered learning—correlated with self-reported reduction in nursing stress and anxiety related to clozapine.

Nurses at the DCMH have an extensive list of tasks, often with a heavy patient load. It was anticipated that nurses may not want to commit to time-consuming education sessions or the increased monitoring included in the clozapine CTK. However, the opposite occurred, and the clozapine education sessions were well-attended and extremely well-received, as seen through written feedback on the post-education questionnaire and through verbal feedback to the researchers. Most nurses shared that they experience stress and anxiety when caring for patients on clozapine, and feel as though they do not have adequate clozapine-related training. Most nurses arrived at the education sessions eager to learn, and were attentive and engaged throughout. After the education sessions, several nurses expressed that the clozapine CTK will provide structure and clear expectations, which will lead to comfort and reassurance that they are optimally caring for their patients on clozapine.

CONCLUSION

Overall, 81 staff nurses attended small group mixed-media education sessions at the DCMH. These sessions improved nursing knowledge on three out of five clozapine knowledge-based questions, and enhanced nurses' confidence in regard to clozapine. Ongoing education services should occur to maintain this competency. Moreover, case-based studies or interactive methods should be utilized to clarify and strengthen the responses to knowledge-based questions 1 and 5. Overall, the education was well-received by participants and will inform future nurse education strategies utilized at the DCMH. In the future, a randomized controlled trial of different nursing education strategies related to clozapine education would help to better articulate the most effective strategy in educating nurses. Further, it would be informative to repeat the post-education questionnaire with the same cohort of nurses at a later point in time to assess knowledge retention.

CONFLICTS OF INTERESTS

The authors declare no conflicts of interest.

The authors would like to thank clinical nurse educators Nikki Meadows and Kimberley Kos "for their enthusiasm, support, and generous efforts in making this study possible".

REFERENCES

[1] Chaghari, M., Saffari, M., Ebadi, A., & Ameryoun, A. (2017). Empowering education: A new model for in-service training of nursing staff. *Journal of Advances in Medical Education & Professionalism, 5*(1), 26–32. Retrieved from https://jamp.sums.ac.ir/article_40982.html

[2] Cohen, D. (2017). Clozapine and gastrointestinal hypomotility. *CNS Drugs, 31*(12), 1083-1091. doi:10.1007/s40263-017-0481-5

[3] De Berardis, D., Rapini, G., Olivieri, L., di Nicola, D., Tomasetti, C., Valchera, A., Fornaro, M., di Fabio, F., Perna, G., di Nicola, M., Serafini, G., Carano, A., Pompili, M., Vellante, F., Orsolini, L., Martinotti, G., & di Giannantonio, M. (2018). Safety of antipsychotics for the treatment of schizophrenia: a focus on the adverse effects of clozapine. *Therapeutic Advances in Drug Safety, 9*(5), 237–256. doi:10.1177/2042098618756261

[4] De Hert, M., de Beugher, A., Sweers, K., Wampers, M., Correll, C. U., & Cohen, D. (2016). Knowledge of Psychiatric Nurses About the Potentially Lethal Side-Effects of Clozapine. *Archives of Psychiatric Nursing, 30*(1), 79–83. doi:10.1016/j.apnu.2015.09.003

[5] Farooq, S., Choudry, A., Cohen, D., Naeem, F., & Ayub, M. (2019). Barriers to using clozapine in treatment-resistant schizophrenia: systematic review. *BJPsych Bulletin, 43*(1), 8–16. doi:10.1192/bjb.2018.67

[6] Fowler, J. A. (2011). Clozapine-induced gastrointestinal hypomotility: More than just constipation. *Mental Health Clinician, 1*(5), 92-93. doi:10.9740/mhc.n87491

[7] Government of Canada. (2015, June 18). *Drug Product Database: Access the database.* Retrieved from https://www.canada.ca/en/health-canada/services/drugs-health-products/drug-products/drug-product-database.html

[8] Higgins, J. M., San, C., Lagnado, G., Chua, D., & Mihic, T. (2019). Incidence and Management of Clozapine-Induced Myocarditis in a Large Tertiary Hospital. *Canadian Journal of Psychiatry, 64*(8), 561–567. doi:10.1177/0706743718816058

[9] Leucht, S., Cipriani, A., Spineli, L., Mavridis, D., Örey, D., Richter, F., Samara, M., Barbui, C., Engel, R. R., Geddes, J. R., Kissling, W., Stapf, M. P., Lässig, B., Salanti, G., & Davis, J. M. (2013). Comparative efficacy and tolerability of 15 antipsychotic drugs in schizophrenia: A multiple-treatments meta-analysis. *The Lancet, 382*(9896), 951–962. doi:10.1016/S0140-6736(13)60733-3

[10] Nucifora Jr, F. C., Woznica, E., Lee, B. J., Cascella, N., & Sawa, A. (2019). Treatment resistant schizophrenia: clinical, biological, and therapeutic perspectives. *Neurobiology of Disease, 131*, 104257. doi:10.1016/j.nbd.2018.08.016

[11] Nucifora, F. C., Mihaljevic, M., Lee, B. J., & Sawa, A. (2017). Clozapine as a model for antipsychotic development. *Neurotherapeutics, 14*(3), 750-761. doi:10.1007/s13311-017-0552-9

[12] Remington, G., Lee, J., Agid, O., Takeuchi, H., Foussias, G., Hahn, M., ... & Powell, V. (2016). Clozapine's critical role in treatment resistant schizophrenia: ensuring both safety and use. *Expert Opinion on Drug Safety, 15*(9), 1193-1203. doi:10.1080/14740338.2016.1191468

[13] Remington, G., Addington, D., Honer, W., Ismail, Z., Raedler, T., & Teehan, M. (2017). Guidelines for the pharmacotherapy of schizophrenia in adults. *The Canadian Journal of Psychiatry, 62*(9), 604-616. doi:10.1177/0706743717720448

[14] Warnez, S., & Alessi-Severini, S. (2014). Clozapine: a review of clinical practice guidelines and prescribing trends. *BMC Psychiatry, 14*(1), 1-5. doi:10.1186/1471-244X-14-102

Appendix The Individual Components That Make up the Clozapine Clinical Toolkit

CLOZAPINE CLINICAL TOOLKIT

Promoting evidence-based monitoring, prescribing, and optimal care for patients treated with clozapine

1 Online Learning

An online learning module was created that is accessible to all Saskatchewan Health Authority staff members. The learning platform reviews in detail the latest evidence for how to care for patients on clozapine, and includes an exam at the end.

2 Work Standards

Work standards are a written description of how a particular process should occur in the hospital. These documents have been updated for nursing and pharmacy staff to meet best-practice standards for patients being treated with clozapine.

3 Pre-Printed Orders

Clozapine got a brand new pre-printed order form! This means that when a prescriber in the hospital wants to order clozapine, this form must be filled out. The form is designed to aid the prescriber by acting as a checklist to ensure the safest dose and necessary tests are being done.

4 Monitoring Flow Sheet

A new user-friendly flow sheet has been created to aid nursing staff in monitoring the many possible clozapine-associated side effects. Notably, it now includes monitoring for signs and symptoms of constipation which was previously overlooked.

5 Discharge Form

A new discharge document has been crafted to ease the transition from hospital to community. The form is meant to act as a summary of the patient's clozapine treatment. The form even has a section where any clozapine-induced adverse effects experienced in hospital can be documented for the healthcare providers in the community to optimally take over the care.

6 Handouts

Different informational handouts have been created. One is for patients being treated with clozapine in the hospital; another is for the patient's treatment in the community. The third is for caregivers.

An Investigation of the Psychosocial Impact of an Intense Outdoor Hiking Challenge on Young Adults: Qualitative and Quantitative Outcomes

Anna G. Gallagher[1], Janine V. Olthuis[1], Alex Whynot[2]

[1] Department of Psychology, University of New Brunswick, Fredericton, New Brunswick

[2] Faculty of Medicine, Dalhousie University, Halifax, Nova Scotia

Abstract **Background:** Adventure Therapy, which often includes forms of green exercise in addition to traditional psychotherapeutic methods, has been shown to be a moderately effective mental health intervention. Limited research, however, has elucidated the impact of a similar type of experience on the mental health and wellbeing of non-clinical populations.
Method: The present study examined the psychosocial impacts of an intense hiking challenge on a sample of healthy adults, using a mixed-method design. Although the challenge under investigation included traditional therapeutic factors of adventure therapy (e.g., group adventure, nature, challenge, and reflection), it was delivered by a nonprofessional and did not explicitly include the use of therapeutic techniques. Participants (N = 21) were recruited from a group of young adults completing a hiking challenge (M age = 22). Participants completed self-report surveys (pre/post/1-month follow-up) to assess mindfulness, self-concept, resilience, self-efficacy, as well as depression, anxiety, and stress. Qualitative data was collected via photovoice-like interviews, to gain a deeper understanding of the impact of the hike on participants.
Results: Linear mixed models revealed significant quadratic changes in depression symptoms, mindfulness, self-concept, and resilience, generally reflecting a significant improvement pre- to post-hike and subsequent deterioration from post-hike to one-month follow-up. Thematic coding of interviews revealed five key themes capturing participants' experiences: 'social connection,' 'overcoming adversity,' 'appreciation for nature,' 'personal growth,' and 'symbolic significance.'
Conclusions: Quantitative and qualitative results suggest that physical activity-based outdoor experiences may contribute to enhanced wellbeing in the short-term among healthy adults, but that additional work is needed to determine how to extend these benefits for the long-term.

Published online
21 December 2021

Citation
Gallagher, A. G., Olthuis, J. V., & Whynot, A. (2021). An Investigation of the Psychosocial Impact of an Intense Outdoor Hiking Challenge on Young Adults: Qualitative and Quantitative Outcomes. *CJUR, 6*(2), 27-35.

Address correspondence to Anna Gallagher at agallag1@unb.ca

INTRODUCTION

An Investigation of the Psychosocial Impact of an Intense Outdoor Hiking Challenge on Young Adults: Qualitative and Quantitative Outcomes

Research has demonstrated the numerous benefits of connectedness with nature on mental and physical health, including subjective feelings of wellbeing and happiness (McMahan, 2018), life satisfaction (Zhang et al., 2014), stress recovery (Brown et al., 2013), and emotional and cognitive restoration (White et al., 2013). When examining the benefits of contact with nature, however, it is difficult to conceptualize nature as acting separately from other relevant factors. Natural environments are inherently conducive to engagement in physical activity (PA) and may also facilitate positive social interaction via shared experiences (Bowler et al., 2010). As both PA and social interaction are well-established contributors to positive health and wellbeing (e.g., Street et al., 2007), nature's apparent restorative potential is interwoven with other influences in a complex fashion (Gladwell et al., 2013). The present study aims to better understand the psychosocial impact of these interwoven factors—nature, PA, and social connectedness—by studying a sample of healthy young adults who participated in an arduous hiking challenge.

Adventure therapy (AT), defined as "the prescriptive use of adventure experiences provided by mental health professionals, often conducted in natural settings that kinesthetically engage clients on cognitive, affective, and behavioural levels" (Gass et al., 2012, p. 1), is one approach that aims to capitalize on nature's restorative potential by incorporating outdoor activity. AT programs have been found to be moderately effective interventions, promoting greater positive psychological, behavioural, emotional, and interpersonal outcomes—in the short- and long-term—as compared to alternative treatments and no treatment controls (Bowen & Neil, 2013). As AT programs are typically delivered in groups (Russell et al., 2017), the benefits of social processes must also be considered as a key component (Bowen & Neill, 2013). Indeed, AT participants have rated group-related aspects (e.g., connectedness with peers) as being more integral to the therapeutic experience than their relationship with the therapist (Revell et al., 2014). Russell et al. (2017) offered a possible explanation for the importance of social dynamics in influencing treatment outcomes, suggesting that "positive attitudes are contagious, whether they be manifest through cognitive, motivational, or affective means, which are all inherent in the adventure therapy experience" (p. 277).

"Green exercise," defined as PA in natural environments, is often a component of AT due to its potential for combining the restorative effects of nature with the health benefits of PA and social interaction (Mackay & Neill, 2010; Gladwell et al., 2013). PA, which often acts as a common denominator among nature-based activities, is well-recognized for its numerous health benefits including physical and psychological wellbeing, increased quality of life, and reduced risk of disease (Waburton et al., 2006; World Health Organization, 2018). Research has suggested that green exercise may provide additional mental health benefits over similar activities indoors, including larger increases in positive affect (Pasanen et al., 2014), greater perceptions of post-activity restoration (Calogiuri et al., 2016), and significant reductions in state anxiety (Mackay & Neill, 2010).

Hiking is a type of green exercise that combines exposure to nature and engagement in PA, which often includes social interaction. As such, hiking may have important implications for psychosocial wellbeing. Research suggests that hiking could even lead to greater psychological benefits as compared to other forms of exercise (Niedermeier et al., 2017; Mutz & Muller, 2016). For example, Niedermeier et al. (2017) found that three hours of outdoor mountain hiking increased positive affect and reduced fatigue to a greater degree than indoor treadmill walking and a sedentary control condition in healthy samples.

Qualitative methods have offered additional insight into the experience and impact of hiking in both healthy and clinical samples. Mutz and Muller (2016) studied the impact of a hiking trip and camping trip on healthy young adults. These experiences were associated with increased wellness, life satisfaction, mindfulness, and self-efficacy, as well as decreased stress (Mutz & Muller, 2016). Along similar lines, Caulkins et al. (2006) examined the psychosocial impacts of a backpacking trip on at-risk adolescent women. Participants reported a range of benefits, such as personal growth, increased confidence, and feelings of accomplishment (Caulkins et al., 2006).

The aim of the present study was to investigate the psychosocial impact of an intense outdoor hiking challenge on a healthy group of young adults. Though existing research supports the therapeutic benefits of outdoor PA on wellbeing, several gaps exist. For example, traditional AT programs incorporate therapeutic strategies and are delivered by professionals, making it difficult to isolate the impact of the challenging outdoor PA activity. In addition, because the majority of AT studies use clinical samples, it is difficult to separate the impact of the AT intervention from the potential effects of context removal (i.e., being removed from a stressful or negative environment, which could be contributing to mental health problems). Furthermore, there is little existing data on the long-term effects of such outdoor activity experiences. In contrast, we were interested in whether a strictly PA intervention, delivered by a nonprofessional, could still benefit participants. This study aimed to fill the current gaps in the literature by (a) examining an intense outdoor activity (participants completed a 150km hike in seven days), (b) having a nonprofessional (vs. psychological or fitness professional) deliver the outdoor hiking challenge, and (c) omitting the implementation of therapeutic strategies. To do so, we incorporated quantitative and qualitative outcome measurement. First, we assessed changes—between pre- to post-hike, as well as one month later—in participants' self-reported self-concept, resilience, mindfulness, self-efficacy, depression, anxiety, and stress symptoms via a self-report questionnaire. Second, we conducted qualitative interviews associated with a photovoice-like task to assess participants' perceptions of the psychosocial benefit derived from the outdoor group hike, thus allowing us to contextualize quantitative findings.

METHOD

Study Design

This study approached data collection using a triangulation (convergence model) mixed methods design, which combines qualitative and quantitative methods to explore a research question (Creswell & Creswell, 2017). The two methods allowed us to capture a deeper understanding of the psychosocial impact of the hike on participants. The quantitative approach allowed us to systematically assess mental health and wellbeing outcomes using reliable tools. The qualitative approach allowed participants to articulate their experience of the hike and its impact on them using rich descriptions that could not be captured numerically. It also allowed us to capture new and original perspectives from participants that we may not have anticipated in our selection of quantitative tools.

Participants

Participants were recruited from a group of young adults completing an intense outdoor challenge that entailed hiking 150 km in mountainous terrain over seven days to raise money for a social cause. The hiking challenge was advertised via student-based social media pages, student unions, and outdoors clubs. The participants were university students. Several weeks before the hike, all hikers were sent an email from the organizer of the hike informing them of the opportunity to participate in the current study. Of the 40 young adults registered for the hike, 21 consented to participate in the current study. Participants were aged 19-25 years (M age = 22.05, SD = 1.53) from thirteen Canadian universities. The majority of participants identified as Caucasian or Euro Canadian (n = 18; 85.7%). Participants reported varying levels of previous hiking experience (e.g., the range of self-reported hiking occasion in the past month was 2-6 times).

Procedure

Ethics approval was obtained from the Research Ethics Board at the University of New Brunswick. Interested participants were emailed a formal invitation to participate by the research team, which included

more information about study participation and an online link to an informed consent form. Those who consented to participate were asked to complete a brief self-report questionnaire one week prior to the hike. The questionnaire was administered via Checkbox, a secure online survey software (a link to the survey was sent to participants via email). Participants completed the same questionnaire both immediately after the hike and one month later (to determine long-term effects of the hike on participants). Post-hike questionnaires were completed in-person, using pen and paper format, and were administered by the organizer of the hike; one month follow-up questionnaires were completed online though a link sent to participants via email. Participants were also invited to participate in a photovoice-like interview at follow-up.

Measures

Five-Facet Mindfulness Questionnaire (FFMQ; Baer et al., 2006). The FFMQ, a 39-item self-report questionnaire, was used to measure mindfulness. In the FFMQ, participants are presented with a series of statements (e.g., "I watch my feelings without getting lost in them") and asked to indicate the extent to which each is true for them on a 5-point Likert scale (1 = never or very rarely true to 5 = very often or always true). The FFMQ produces a total score for overall mindfulness, which was used for the present study, and has good internal consistency and convergent validity (Baer et al., 2006). In the current study, the internal validity for the FFMQ was good (α = .88).

Connor-Davidson Resilience Scale (CD-RISC; Connor & Davidson, 2003). The CD-RISC, a 25-item self-report questionnaire, was used to measure resilience. In the CD-RISC, participants are instructed to indicate how much they agree or disagree with a series of statements when thinking about the past month (e.g., "I am able to adapt when changes occur"). Items are rated on a 5-point Likert scale (0 = not true at all to 4 = true nearly all the time) and summed to create an overall score, with higher scores reflecting greater resilience. The CD-RISC has good internal consistency, test-retest reliability, and discriminant validity (Connor & Davidson, 2003). The internal validity of the CD-RISC was excellent in the current study (α = .95).

Robson Self-Concept Questionnaire (RSCQ; Robson, 1989). Self-concept was assessed using the 30-item RSCQ. In the RSCQ, participants indicate how much they agree or disagree with each item (e.g., "I feel emotionally mature"), using an 8-point Likert scale (0 = completely disagree to 7 = completely agree). Items are summed to create a total score. The RSCQ has good reliability and validity (Robson, 1989). In the current study, the internal validity of the RSCQ was excellent (α = .94).

Depression Anxiety Stress Scales (DASS; Lovibond & Lovibond, 1995). Current mental health symptoms were assessed using the DASS. With the DASS, participants rate the extent to which they have experienced symptoms of depression (e.g., "I felt sad and depressed"), anxiety (e.g., "I found myself in situations that made me so anxious I was most relieved when they ended"), and stress (e.g., "I found it hard to wind down") over the past week, using a 4-point Likert scale (0 = did not apply to me at all to 3 = applied to me very much or most of the time). Separate scores for depression, anxiety, and stress subscales are calculated by summing the scores of relevant items. The DASS has good internal consistency, as well as good convergent, discriminant, and structural validity (Brown et al., 1997; Lovibond and Lovibond 1995). In the current study, the internal validity for the DASS depression, anxiety, and stress subscales ranged from good to excellent (α =.92; α = .79; α = .83).

General Self-Efficacy Scale (GSE; Schwarzer & Jerusalem, 1995). Self-efficacy was measured using the 10-item GSE. In the GSE, participants are asked to rate how true each of a series of statements (e.g., "I can handle whatever comes my way") is about themselves on a 4-point scale (1 = not at all true to 4 = exactly true). Items are summed to create a total score. The GSE has good internal consistency and criterion-related validity (Schwarzer & Jerusalem, 1995). The internal consistency of the GSE was good in the current study (α = .79).

Photovoice-like interview. Participants were invited to participate in an optional photovoice-like interview task. We drew from Palibroda et al.'s (2009) guidelines for photovoice research but deviated from their recommendations in several ways; for instance, we conducted individual (vs. group) interviews. Importantly, our use of photovoice was as a data collection—not analysis—technique. Given that our use of the method strays from its original conceptualization as a tool to convey the experiences of marginalized groups (Wang, 1999), we have labelled our research methodology "photovoice-like." At the outset of the hike, participants were told they would have the option to participate in a photovoice-interview task. They were told that researchers were interested in understanding young adults' experiences with nature, young adults' experiences with physical and mental challenges, and how the challenging experience might impact mental health and wellbeing. Participants were asked to take pictures during the hike documenting their experience and send 3-8 pictures to the research team. The participants understood that when they returned from the hike, they would complete an interview with a member of the research team to describe their experiences in relation to the photos they took; subsequently, semi-structured interviews (guided by McIntryre, 2003) were conducted. Interviews began with questions specific to 2-3 photos selected by participants (e.g., What is the meaning of this photo? Do you think others would connect with this picture?) and concluded with broader questions about the hike (e.g., How did you feel during the hike/after the hike was over?). Interviewers encouraged participants to expand upon discussion subjects, to best capture their experience. Interviews were conducted via Skype, except in three cases in which the research team was unable to coordinate a time for the interview with participants. In those cases, interviewers sent questions to participants via email with answers returned in the same format. Researchers audio-recorded and transcribed the interviews to facilitate thematic coding. Information about the psychosocial impact of the hike on participants was extracted from the interviews.

Data Analytic Plan

Data were analyzed using linear mixed models with the lme4 package in R software (R Core Team, 2019). Specifically, we ran six separate models, one each for FFMQ, DASS-A, DASS-D, DASS-S, RSCQ, GSES, and CD-RISC as outcomes. In these models, time was entered as a predictor with orthogonal polynomial contrast coding, random intercepts, and fixed slopes. There were too few time points to employ random slopes for time. The polynomial contrast coding produces two test statistics: (a) linear contrasts, which examine whether there is linear change from pre-test to retention and (b) quadratic contrasts, which examines whether there is a bend in the line for the rate of change over time. Diagnostics of the distributions of our data with plots suggested that DASS-D had a very positively

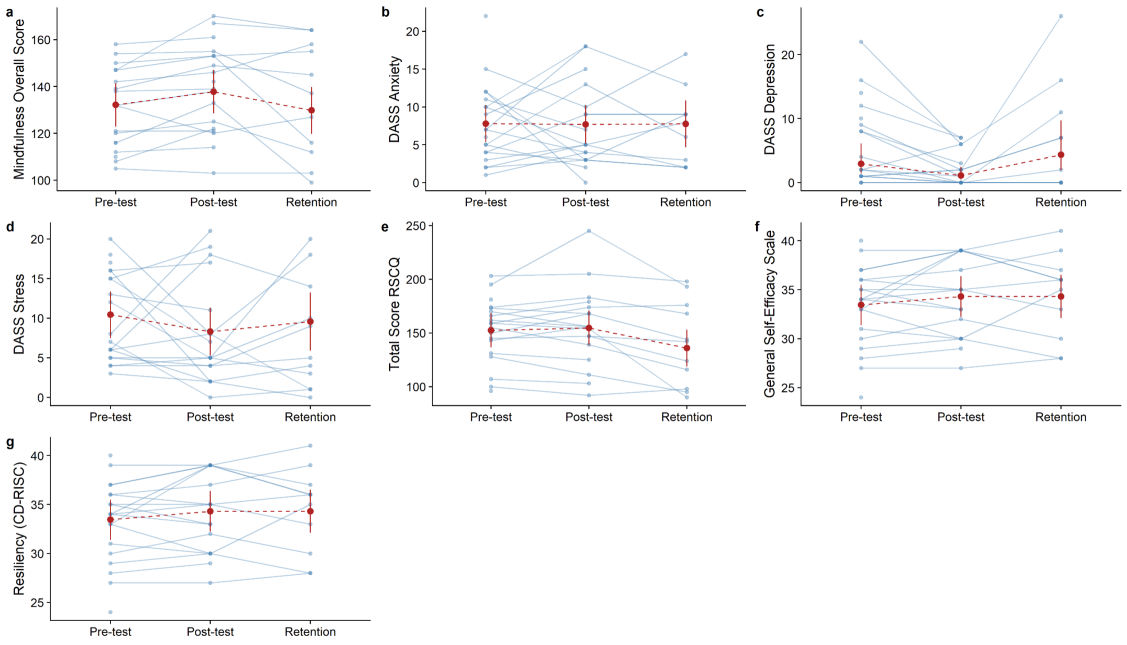


Figure 1 Change in psychosocial outcomes over time (pre, post, follow-up) for each individual. Model-derived estimated marginal means and 95% confidence intervals shown in red.

skewed distribution, so a generalized linear mixed model assuming a negative binomial distribution was employed for this variable. For all other variables, a normal distribution was assumed. Conditional and marginal R^2 values are presented as effect sizes; conditional R^2 values include the random effects, whereas marginal R^2 values include only the effect of time (Nakagawa, Johnson, & Schielzeth, 2017). Alpha was set at .025 given that an overall omnibus test was not conducted and there are two contrasts per analysis.

For thematic analysis of the interviews, a codebook was drafted based on the 6-step framework established by Braun and Clarke (2006). To create the codebook, researchers read over the interviews several times, looking for significant, re-occurring concepts. Significance was understood as similar references by two or more participants. Codes were developed by applying labels and definitions to significant concepts. Once codes were created, and to maximize the validity of the analysis, two researchers worked through the interviews separately, using the codebook to code statements. From these results, the research team developed key themes by expanding upon the codes and contextualizing them within the hike. We then wrote detailed descriptions of the themes and selected exemplar quotes to illustrate their essence. Potentially identifying information was removed to protect participant anonymity. In instances of direct quotation in this article, participants were given pseudonyms.

RESULTS

Quantitative Results

Test statistics, R^2 values, estimated marginal means, and confidence intervals are located in Tables 1 and 2. Overall, results for the linear contrasts suggest that self-concept (RSCQ) had a statistically significant decrease from pre-test to retention. Participants decreased their scores on the RSCQ by about 16 units and time explained about 4.6% of the variance in self-concept. The significant quadratic trend for RSCQ reflects the lack of change from pre-post on this variable. There were also significant quadratic trends for mindfulness (FFMQ), depression (DASS-D), and resilience (CD-RISC). In the case of mindfulness and depression, the therapeutic improvements were short-lived, and were no longer detectable at retention. In the case of CD-RISC, there was a small (~1 unit) improvement pre-post, and no change from post to retention. Raw data and trends over time are displayed in Figure 1. These plots reveal the general quadratic trends found for most variables, but also demonstrates a wide range of heterogeneity across individual participants. Broadly, results should be interpreted cautiously given the small sample size and heterogeneity of participant trajectories.

Qualitative Results

Through photovoice interviews, participants reflected on the hike and discussed meaningful aspects of their experiences. Thematic analysis of participant responses led to the identification of five main themes, which we have labeled 'social support/connection,' 'overcoming adversity,' 'appreciation for nature,' 'personal growth,' and 'symbolic significance.' Below, we describe the essence of each theme. Sample quotes from participants to illustrate the themes are presented in Table 3.

Social connection. This theme reflects participant references to social relationships as an important aspect of the hiking experience. Participants emphasized the importance of working with others during the hike, processing the experience through group discussion, and forming meaningful, lasting friendships.

Overcoming adversity. This theme captures references to overcoming physical and emotional challenges during the hike. Participants reported facing many forms of adversity, including fatigue, soreness, injury, and negative mood. In overcoming adversity, participants endorsed feelings of pride and accomplishment. Avenues for overcoming adversity included individual coping strategies (e.g., mindfulness, determination, gratitude), social support (e.g., mutual encouragement, collective identity), and connectedness with nature (e.g., scenery as a reward for challenging hikes).

Appreciation of nature. This theme includes references to nature, such as natural views, landscapes, and features. Participants reported experiencing feelings of 'calmness,' likened to a sense of presence or mindfulness, which they attributed to being in nature. Participants also drew a sense of awe and inspiration from the grandeur of nature. It was suggested that spending time in nature offered perspective, which could be applied to everyday life.

Personal growth. This theme encompasses participants' reflections of positive personal change experienced during and after the hike. As a result of the experience, participants reported positive changes in confidence, sense of self, and perspective on life, as well as newfound knowledge and abilities. In addition, participants reported experiencing mental health benefits, such as positive mood and the accrual of new emotion regulation strategies, along with decreased stress, anxiety, and negative affect. Participants suggested that these gains were relevant to numerous areas of their life (e.g., work, school, friendships), particularly during times of stress.

Symbolic significance. This theme alludes to participants' use of symbolism in describing their hiking experience. Predominantly, participants employed symbolism to draw comparisons between the hiking challenge and the Terry Fox Run (the students were fundraising for cancer research). Many participants drew inspiration from Terry Fox's story for motivation to persevere through difficult treks.

Sentiments permeating identified themes. While five primary themes were identified, we also noted that two broader themes seemed to pervade all five of these primary themes. First, it was evident that participants viewed completing the hiking challenge as a significant accomplishment. As such, sentiments of pride and accomplishment permeated across the main themes and were particularly prominent in the themes of 'overcoming adversity' and 'social support/ connection.' Second, a sense of nostalgia pervaded participants' reflections of the experience and appeared throughout the five primary themes. Participants expressed a longing to return to the hike, an interest in spending more time in nature, a feeling of missing their fellow hikers, and a desire to have additional transformative experiences such as this one.

DISCUSSION

The present study examined the psychosocial impact of an intense hiking challenge on a sample of healthy young adults by using a mixed-method design. Overall, findings showed improvements in mental health and wellbeing from pre- to post-hike (increase in mindfulness and resilience, and decrease in depressive symptoms) but subsequent deteriorations in functioning (i.e., return to baseline) from post-hike to one-month follow-up (decrease in mindfulness and self-concept, and increase in depressive symptoms), suggesting that most changes were not maintained. Notably, several outcomes (self-efficacy, anxiety, and stress) did not change significantly over the course of the hike. This may be because participants' anxiety and stress levels were already quite low pre-hike (in the normal, non-clinical range; Lovibond & Lovibond, 1995), and because measuring general self-efficacy precluded us from noticing any changes in exercise-specific self-efficacy, which may have been more likely to emerge. Results suggest that participation in intense green exercise can be a deeply meaningful experience, which may contribute to short-term increases in perceived mental health and wellbeing for healthy individuals. Interestingly, participant trajectories show significant heterogeneity, suggesting that there are likely other factors (e.g., individual characteristics) individualizing the impact of the hiking challenge on participants' mental health and wellbeing.

To complement quantitative findings, photovoice interviews were analyzed. Thematic coding revealed five themes, reflecting key aspects of the hike as articulated by participants: (1) 'social connection,' reflecting participants' perception of the importance of friendship and social support to their enjoyment and success on the hike; (2) 'overcoming adversity,' encapsulating participants' success persevering through a variety of challenges; (3) 'personal growth,' encompassing acquisition of new skills, knowledge, or beliefs through learned experience; (4) 'appreciation for nature,' reflecting participants' appreciation of nature's importance and acknowledgment of beauty in the natural environment; and (5)'symbolic significance,' conveying the use of symbolism to represent and communicate the meaningfulness of participants' experiences. A sense of pride and accomplishment permeated the identified themes. In addition, a theme of nostalgia (for the experience and associated positive affect) was found throughout the primary themes, perhaps capturing the lack of maintenance of quantitative mental health and wellbeing gains from post-hike to follow-up.

Qualitative data suggest that quantitative reductions in depressive symptoms from pre- to post-hike could be a product of experiences during the hike, such as friendships formed ('social connection'), a sense of accomplishment in overcoming challenges ('overcoming adversity'), enjoying time spent outdoors ('appreciation for nature'), and perceived self-improvement ('personal growth'). Previous research has linked increased social connection (Steger & Kashdan, 2009), exposure to nature (Beyer et al., 2016), and opportunities for growth of self-efficacy (Pu et al., 2017) to reduced depression. Indeed, behavioural activation, a common intervention for depression, is theorized to work via these mechanisms (Kellett et al., 2017). Mood improvements were not retained over time. "Post-hike depression" is a common term among the online hiking community (Parris, n.d.), and is used to describe negative mood swings purported to accompany the completion of a long-distance hike. Again, qualitative data offers insight into this phenomenon, as participants alluded to feelings of nostalgia, in that their everyday lives were marked by a desire for additional transformative experiences. In this study, no steps were taken to promote maintenance of positive mood post-hike. Future work may want to explore how to extend improvements in affect beyond the activity period.

An increase in mindfulness was observed from pre- to post-hike; however, this observation was not maintained at follow-up. A meta-analytic review by Schutte and Malouff (2018) suggests that connectedness with nature may be related to trait mindfulness in a reciprocal manner, in such a way that mindfulness may promote a connectedness to nature and exposure to/experiences in nature may foster mindfulness. Qualitative results of the current study support a relation between mindfulness and connectedness with nature. Participants alluded to being especially present throughout the hike, in the form of being attuned to their surroundings, thoughts, and feelings. A lack of maintenance of gains in mindfulness may be due to a separation between participants and nature at the end of the hike, or because the length of exposure to nature was not long enough to result in long-term change.

Resilience showed a small quantitative increase from pre- to post-hike. This change is reflected in qualitative themes of 'overcoming adversity' and 'personal growth.' Results suggest that overcoming a challenge may increase an individual's confidence in their ability to overcome future challenges. This finding aligns with previous research, suggesting that when experienced in moderate amounts, some lifetime adversity may foster greater resiliency in the long-term (Seery, 2011). PA has been identified as an influential factor in the relation between resilience and mental wellbeing. Based on data from

healthy adolescents, Gerber et al. (2012) demonstrated that resilience-related traits (e.g., mental toughness) interacted with levels of PA to mediate the relation between negative life events and mental health. It was suggested that PA may strengthen stress-response systems, increasing resilience.

Finally, considering the complexity of self-concept in both definition and development, it is difficult to determine why we see a decrease in self-concept from post-hike to the one-month follow-up interview. Researchers have theorized that aspects of self-concept may be state-dependent, influenced by numerous contextual factors (Ghorpade, 2009). Within the context of the hike, it is possible that participants developed positive self-representations specific to the hike. Perhaps the hike was not long enough for these changes to fully emerge (hence, the lack of significant change pre- to post-hike), but participants still experienced a change in self-concept when they resumed their daily activities.

Limitations of the current study include characteristics of the sample, method, and research design. First, participants were young adults selected on the basis of interest in participating in a challenging outdoor hiking experience. Compared to the general population, participants in this study may have had higher confidence regarding their ability to complete and enjoy a 150 km hike. Results may not generalize to clinical populations or to populations unable to complete such an intensive outdoor hiking experience. Second, due to a relatively small sample size, quantitative analyses are underpowered and so some effects may not have been detected. Third, there was no control condition; we cannot completely rule out the effects of the passage of time on participant outcomes. Nevertheless, given the pattern of results (an increase and decrease in mood symptoms coinciding with the hike and its conclusion), it seems likely that changes in outcomes correspond with the hiking experience. Future work might consider examining the effects of a hiking challenge via a randomized design with a control condition. It could also be beneficial for future research to compare the effects of participating in more traditional PA programs to the effects of participating in an intense outdoor challenge, both with and without therapeutic components.

Results of the present study suggest that short-term benefits to resilience, mood, and mindfulness may be gained among healthy young adults, following strenuous group outdoor exercise that combines PA, time spent in nature, and social interaction. This is promising in terms of understanding how one might enhance or maximize mental wellness through an activity that is relatively accessible, as well as physically beneficial. This type of activity could be better integrated into wellness strategies and should be further studied in clinical populations. Importantly, however, most of the benefits accrued from this type of strenuous green exercise may not be retained over time. Additional components (e.g., professional delivery, incorporation of therapeutic techniques, follow-up contact with fellow participants, journaling to consolidate gains, and/or incorporation of regular PA into the follow-up period) may need to be added to extend its benefits longer term. Considering the benefits of PA, time spent in nature, and social connection, further research is needed to understand the interacting and independent contributions of these factors in in outdoor adventure experiences.

CONFLICTS OF INTERESTS

The authors declare no conflicts of interest.

The authors would like to thank Sean Mackinnon "who conducted the quantitative data analysis and created tables and figures" and Kevan Kostynski "who assisted with qualitative analysis and development of the codebook".

REFERENCES

[1] Baer, R. A., Smith, G. T., Hopkins, J., Krietemeyer, J., & Toney, L. (2006). Using self-report assessment methods to explore facets of mindfulness. *Assessment, 13*, 27–45. https://doi.org/10.1177/1073191105283504

[2] Beyer, K. M. M., Szabo, A., & Nattinger, A. B. (2016). Time spent outdoors, depressive symptoms, and variation by race and ethnicity. American *Journal of Preventive Medicine, 51*, 281–290. https://doi.org/10.1016/j.amepre.2016.05.004

[3] Bowen, D. J., & Neill, J. T. (2013). A meta-analysis of adventure therapy outcomes and moderators. *The Open Psychology Journal, 6*, 28–53. https://doi.org/10.2174/1874350120130802001

[4] Bowler, D. E., Buyung-Ali, L. M., Knight, T. M., Pullin, A. S. (2010). A systematic review of evidence for the added benefits to health of exposure to natural environments. *BMC Public Health, 10*, 1–10. https://doi.org10.1186/1471-2458-10-456

[5] Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*, 77–100. https://doi.org/10.1191/1478088706qp063oa

[6] Brown, D. K., Barton, J. L., & Gladwell, V. F. (2013). Viewing nature scenes positively affects recovery of autonomic function following acute-mental stress. *Environmental Science & Technology, 47*, 5562–5569. https://doi.org/10.1021/es305019p

[7] Brown, T. A., Chorpita, B. F., Korotitsch, W., & Barlow, D. H. (1997). Psychometric properties of the Depression Anxiety Stress Scales (DASS) in clinical samples. *Behaviour Research and Therapy, 35*, 79–89. https://doi.org/10.1016/S0005-7967(96)00068-X

[8] Calogiuri, G., Evensen, K., Weydahl, A., Andersson, K., Patil, G., Ihlebæk, C., & Raanaas, R. K. (2016). Green exercise as a workplace intervention to reduce job stress: Results from a pilot study. *Journal of Prevention, Assessment & Rehabilitation, 53*, 99–111. https://doi.org/10.3233/WOR-152219

[9] Caulkins, M. C., White, D. D., & Russell, K. C. (2006). The role of physical exercise inwildemess therapy for troubled women. *Journal of Experiential Education, 29*, 18–32. https://doi.org/10.1177/105382590602900104

[10] Connor, K. M., & Davidson, J. R. (2003). Development of a new resilience scale: The Connor-Davidson Resilience Scale. *Journal of Depression and Anxiety, 18*, 76–82. https://doi.org/10.1002/da.10113

[11] Creswell, J. W., & Creswell, J. D. (2017). *Research design: Qualitative, quantitative, and mixed methods approaches.* Sage publications.

[12] Gass, M. A., Gillis, H. L. L., & Russell, K. C. (2012). *Adventure therapy: Theory, research, and practice.* Routledge/Taylor & Francis Group.

[13] Gerber, M., Kalak, N., Lemola, S., Clough, P. J., Pühse, U., Elliot, C., Holsboer-Trachsler, E., & Brand, S. (2012). Adolescents' exercise and physical activity are associated with mental toughness. *Mental Health and Physical Activity, 5*, 35–42. https://doi.org/10.1016/j.mhpa.2012.02.004

[14] Ghorpade, A. (2009). State-dependent self-representations: a culture-bound aspect of identity. *The American Journal of Psychoanalysis, 69*, 72–79. https://doi.org/10.1057/ajp.2008.40

[15] Gladwell, V. F., Brown, D. K., Wood, C., Sandercock, G. R., & Barton, J. L. (2013). The great outdoors: How a green exercise environment can benefit all. *Extreme Physiology & Medicine, 2*. https://doi.org/10.1186/2046-7648-2-3

[16] Kellett, S., Simmonds-Buckley, M., Bliss, P., & Waller, G. (2017). Effectiveness of group behavioural activation for depression: A pilot study. *Behavioural and Cognitive Psychotherapy, 45*, 401–418. https://doi.org/10.1017/S1352465816000540

[17] Lovibond, P. F., & Lovibond, S. H. (1995). The structure of negative emotional states: comparison of the Depression Anxiety Stress Scales (DASS) with the Beck Depression and Anxiety Inventories. *Behaviour Research and Therapy, 33*, 335–343. https://doi.org/10.1016/0005-7967(94)00075-U

[18] Mackay, G. J., & Neill, J. T. (2010). The effect of "green exercise" on state anxiety and the role of exercise duration, intensity, and greenness: A quasi-experimental study. *Psychology of Sport and Medicine, 11*, 238–245. https://doi.org/10.1016/j.psychsport.2010.01.002

[19] McIntryre, A. (2003). Through the eyes of women: Photovoice and participatory action research as tools for reimagining place. *Gender, Place and Culture, 10*(1), 47-66. https://doi.org/10.1080/0966369032000052658

[20] McMahan, E. A. (2018). Happiness comes naturally: Engagement with nature as a route to positive subjective well-being. In E. Diener, S. Oishi, & L. Tay (Eds.), *Handbook of well-being* (pp. 1–63). DEF Publishers.

[21] Mutz, M., & Muller, J. (2016). Mental health benefits of outdoor adventures: Results from two pilot studies. *Journal of Adolescence, 49*, 105–114. https://doi.org/10.1016/j.adolesence.2016.03.009
[22] Nakagawa, S., Johnson, P. C., Schielzeth, H. (2017). The coefficient of determination R2 and intra-class correlation coefficient from generalized linear mixed-effects models revisited and expanded. *Journal of the Royal Society Interface, 14*, 1–11. https://doi.org/10.1098/rsif.2017.0213
[23] Niedermeier, M., Einwanger, J., Hartl, A., & Kopp, M. (2017). Affective responses in mountain hiking: A randomized crossover trial focusing on differences between indoor and outdoor activity. *PLOS ONE, 12*, 1–17. https://doi.org/10.1371/journal.pone.0177719
[24] Palibroda, B., Krieg, B., Murdock, L., & Havelock, J. (2009, March). *A practical guide to photovoice: Sharing pictures, telling stories and changing communities.* The Prairie Women's Health Centre of Excellence. http://www.pwhce.ca/photovoice/pdf/Photovoice_Manual.pdf
[25] Parris, A. (n.d.). Life after the PCT: Post-hike depression. *REI Co-op Journal.* https://www.rei.com
[26] Pasanen, T. P., Tyrväinen, L., & Korpela, K. M. (2014). The relationship between perceived health and physical activity indoors, outdoors in built environments, and outdoors in nature. *Applied Psychology: Health And Well-Being, 6*, 324–346. https://doi.org/10.1111/aphw.12031
[27] Pu, J., Hou, H., & Ma, R. (2017). Direct and indirect effects of self-efficacy on depression: The mediating role of dispositional optimism. *Current Psychology: A Journal for Diverse Perspectives on Diverse Psychological Issues, 36*, 410–416. https://doi.org/10.1007/s12144-016-9429-z
[28] R Core Team (2019). *R: A language and environment for statistical computing*. R Foundation for Statistical Computing. https://www.R-project.org/.
[29] Revell, S., Duncan. E., & Cooper, M. (2014). Helpful aspects of outdoor therapy experiences: An online preliminary investigation. *Counselling and Psychotherapy Research, 14*, 281–287. https://doi.org/10.1080/14733145.2013.818159
[30] Robson, P. J. (1989). Development of a new self-report questionnaire to measure self-esteem. *Psychological Medicine, 19*, 513–518. https://doi.org/10.1017/S003329170001254X
[31] Russell, K., Gillis, H. L., & Kivlighan, D. M. (2017). Process factors explaining psychosocial outcomes in adventure therapy. *Journal of Psychotherapy, 54,* 273–280. https://doi.org/10.1037/pst0000131
[32] Schutte, N. S., & Malouff, J. M. (2018). Mindfulness and connectedness to nature: A meta-analytic investigation. *Personality and Individual Differences, 127,* 10–14. https://doi.org/10.1016/j.paid.2018.01.034
[33] Schwarzer, R., & Jerusalem, M. (1995). Generalized Self-Efficacy scale. In J. Weinman, S. Wright, & M. Johnston (Eds.), *Measures in health psychology: A user's portfolio* (pp. 35–37). NFER-NELSON.
[34] Seery, M. D. (2011). Resilience: A silver lining to experiencing adverse life events. *Psychological Science, 20*, 390–394. https://doi.org/10.1177/0963721411424740
[35] Steger, M. F., & Kashdan, T. B. (2009). Depression and everyday social activity, belonging, and well-being. *Journal of Counselling Psychology, 56,* 289–300. https://doi.org/10.1037/a0015416
[36] Street, G., James, R., & Cutt, H. (2007). The relationship between organised physical recreation and mental health. *Health Promotion Journal Of Australia, 18*, 236–239. https://doi.org/10.1071/HE07236
[37] Waburton, D. E. R., Nicol, C. W., & Bredin, S. S. D. (2006). Health benefits of physical activity: The evidence. *Canadian Medical Association Journal, 174*, 801–809. https://doi.org/10.1503/cmaj.051351
[38] Wang, C. (1999). Photovoice: A participatory action research strategy applied to women's health. *Journal of Women's Health, 8*(2), 185-192. https://doi.org/10.1089/jwh.1999.8.185
[39] White, M. P., Pahl, S., Ashbullby, K., Herbert, S., & Depledge, M. H. (2013). Feelings of restoration from recent nature visits. *Journal of Environmental Psychology, 35*, 40–51. https://doi.org/10.1016/j.jenvp.2013.04.002
[40] World Health Organization (2018). *New active people for a healthier world: The global action plan on physical activity 2018-2030.* http://www.who.int
[41] Zhang, J. W., Howell, R. T., & Iyer, R. (2014). Engagement with natural beauty moderates the positive relation between connectedness with nature and psychological well-being. *Journal of Environmental Psychology, 38,* 55–63. https://doi.org/10.1016/j.jenvp.2013

TABLES

Table 1 Linear and Polynomial Contrasts from Linear Mixed Models for Psychosocial Outcome Data (Pre, Post, Follow-up)

	FFMQ		DASS-A		DASS-D		DASS-S		RCSQ		GSES		CD-RISC	
Predictor	z	P	z	P	z	P	z	P	z	P	z	P	z	P
time.poly.L	0.66	0.510	-0.02	0.987	1.26	0.208	-0.46	0.648	-2.90	0.004	1.22	0.223	-0.54	0.588
time.poly.Q	-2.49	0.013	0.06	0.949	4.38	<0.001	1.17	0.244	-2.45	0.014	-0.81	0.416	-3.06	0.002
Marginal R^2/ Conditional R^2	0.028 / 0.813		0.000 / 0.428		0.119 / 0.828		0.022 / 0.450		0.046 / 0.844		0.009 / 0.850		0.051 / 0.758	

Note: FFMQ = Five Factor Mindfulness Questionnaire; DASS-D = Depression Anxiety Stress Scales – Depression Subscale; DASS-A = Depression Anxiety Stress Scales – Anxiety Subscale; DASS-S = Depression Anxiety Stress Scales – Stress Subscale; GSES = General Self-Efficacy Scale; RSCQ = Robson Self Concept Questionnaire; CD-RISC = Connor-Davidson Resilience Scale.

Table 2 Estimated Marginal Means and Confidence Intervals for Psychosocial Outcome Data (Pre, Post, Follow-up)

Variable	Timepoint	Mean	SD	EMM	SE	95% CI Lower	95% CI Upper
FFMQ	Pre-test	130.4	17.2	132.2	4.5	122.9	141.4
	Post-test	139.5	19.0	137.8	4.5	128.5	147.1
	Retention	134.5	24.5	129.8	4.9	119.7	139.8
DASS-A	Pre-test	7.7	5.3	7.8	1.2	5.3	10.2
	Post-test	7.4	5.5	7.7	2.3	5.2	10.2
	Retention	7.3	4.9	7.8	1.5	4.7	10.8
DASS-D	Pre-test	5.9	6.5	2.9	1.1	1.4	6.1
	Post-test	2.1	2.6	1.1	0.4	0.5	2.4
	Retention	6.3	8.5	4.4	1.8	2.0	9.7
DASS-S	Pre-test	10.3	5.7	10.4	1.4	7.5	13.4
	Post-test	7.9	6.5	8.3	1.5	5.3	11.3
	Retention	7.7	7.0	9.6	1.8	5.9	13.2
RSCQ	Pre-test	152.5	29.8	152.4	7.7	136.5	168.3
	Post-test	156.0	36.4	154.7	7.8	138.7	170.7
	Retention	140.4	39.2	136	8.4	118.8	153.1
GSES	Pre-test	33.3	4.2	33.4	1.0	31.4	35.5
	Post-test	34.4	4.1	34.3	1.0	32.3	36.4
	Retention	34.5	4.3	34.3	1.1	32.1	36.5
CD-RISC	Pre-test	73.1	12.2	33.4	1.0	21.4	35.5
	Post-test	79.2	13.8	34.3	1.0	32.2	36.4
	Retention	70.5	16.1	34.3	1.1	32.1	36.5

Note. EMM = Estimated Marginal Mean. SE = Standard Error. 95% CI = 95% Confidence Interval around the mean. FFMQ = Five Factor Mindfulness Questionnaire; DASS-D = Depression Anxiety Stress Scales – Depression Subscale; DASS-A = Depression Anxiety Stress Scales – Anxiety Subscale; DASS-S = Depression Anxiety Stress Scales – Stress Subscale; GSES = General Self-Efficacy Scale; RSCQ = Robson Self Concept Questionnaire; CD-RISC = Connor-Davidson Resilience Scale.

Table 3 Themes Extracted from Qualitative Interviews

Themes	Essence	Sample questions
PRIMARY THEMES		
Social connection	Reflects references to social relationships as an important aspect of the hiking experience. Participants referenced the importance of working with others during the hike ('teamwork'), processing the experience through group discussion ('group reflection'), and forming meaningful, lasting friendships ('friendship').	"Being able to push yourself through this last section here was really hard, but you were able to lean on the people hiking beside you." -Xavier "The most enjoyable part was being able to share it with other people because it was just so interesting to see everyone else's perspectives on it, what it meant to them, what they were learning from it . . . it just made it more meaningful to be able to talk about it." - Cassandra "I think it's a good feeling when you start connecting with people and especially when you've just met them, but you already feel so close … going through a physical challenge like this helps speed up that connection." -Nick
Overcoming adversity	Captures references to overcoming physical and emotional challenges during the hike. Participants reported facing many forms of adversity, including fatigue, soreness, injury, and negative mood. In overcoming adversity, participants endorsed feelings of pride and accomplishment. Avenues for overcoming adversity included individual coping strategies (e.g., mindfulness, determination, gratitude), social support (e.g., mutual encouragement, collective identity), and connectedness with nature (e.g., scenery as a reward for challenging hikes).	"That one particular segment, we're climbing way up, it was extremely tough. Again, a lot of people struggled with it. So, once we got up to the top, we got to that view and you could just see all the peaks in the distance. You could see how high we were, how far we'd come." -Jonathan
Appreciation of nature	Includes references to nature, such as natural views, landscapes, and features. Participants reported experienced feelings of 'calmness,' likened to a sense of presence or mindfulness, which they attributed to being in nature. Participants also drew a sense of 'awe and inspiration' from the grandeur of nature. It was suggested that spending time in nature offered perspective, which could be applied to everyday life.	"It makes me feel calm … Reminds me about how day to day stress and stuff like that isn't as significant." -Louisa "Anything I do or suffer will be insignificant compared to the beauty and power of nature." -Francis
Personal growth	Encompasses participants' reflections of positive personal change experienced during and after the hike. Participants reported positive changes in confidence, sense of self, and perspective on life, as well as newfound knowledge and abilities. In addition, participants reported experiencing mental health benefits, such as positive mood and the accrual of new emotional regulation strategies, as well as decreased stress, anxiety, and negative affect. Participants suggested that these gains were relevant to numerous areas of their life (e.g., work, school, friendships), particularly during times of stress.	"Every trek I go on I end up learning something about myself. Sometimes it's hard to pin down exactly or put exactly into words what it is but … I can use it as a tool, my own toolbox of getting through everyday stress." -Nick
Symbolic significance	Alludes to participants' use of symbolism in describing the hiking experience. Predominantly, participants employed symbolism to draw comparisons between the hiking challenge and the Terry Fox Run (the students were fundraising for cancer research). Many participants drew inspiration from Terry Fox's story for motivation to persevere through difficult treks.	"I think the marathon day, the whole experience of that was the most important because it was more symbolic of what we were trying to do and why we were doing it, in terms of Terry Fox's original goals and how we were trying to mirror that." -Cassandra
SENTIMENTS PERMEATING THEMES		
Pride and accomplishment	Participants viewed completing the hiking challenge as a significant accomplishment. As such, sentiments of pride and accomplishment permeated across the main themes and were particularly prominent in the themes 'overcoming adversity' and 'social support/connection.'	"What a proud, but at the same time, humble moment. We'd accomplished something great... as a small piece to a giant picture. The grandeur of it all moves me." -Isaac
Nostalgia	Nostalgia pervaded participants' reflections on the experience and appeared throughout the five primary themes. Participants expressed a longing to return to the hike, an interest in spending more time in nature, a feeling of missing fellow hikers, and a desire to have additional transformative experiences.	"During the hike, like this is awesome! Every day wake up, make food on a tiny stove, head out on the trail, come back and chill. That lifestyle I guess, is just so cool. After it's just like I want to do more of this. Just put me back there. Just leave me there." -Aubrey

Asian Women's Experience of Fear of Crime on Public Transportation in Metro Vancouver

Emma Wong [1]

[1] Simon Fraser University, Burnaby, British Columbia

Abstract There is an absence in the current criminological literature of peer-reviewed studies examining fear of crime on public transportation in Canada. More specifically, few studies have examined fear of crime on public transportation governed by TransLink in Metro Vancouver. This qualitative study involved 12 semi-structured, in-depth interviews to explore how Asian women experience fear of crime on public transportation in Metro Vancouver. The data were analyzed and coded inductively with three key themes emerging from the data. First, the majority of the participants indicated that they overall felt safe on public transportation. Second, participants explained various factors that increase their feelings of safety on public transportation, including transit locations with strong visibility and lighting, the presence of Transit Officials, and the transit station itself. Participants noted specific factors that decrease their feelings of safety, including travelling at night and being female. The findings provide key policy recommendations for TransLink: first, to improve their safety features on buses to be more aligned with SkyTrain safety features; and second, to improve visibility and lighting at SkyTrain and bus stations in accordance with Crime Prevention Through Environmental Design principles.

INTRODUCTION

Existing studies have documented differences in people's experiences of crime and their fear of crime, with the majority of these studies having been conducted outside of Canada (e.g., in Australia (Currie et al., 2013); the United Kingdom (Cozens et al., 2003, 2004); the United States of America (Loukaitou-Sideris & Fink, 2009; Yavuz et al., 2007); Mexico City (Vilalta, 2011); and Nigeria (Badiora et al., 2015)). Further, very few peer-reviewed studies have examined fear of crime and public transportation use within Metro Vancouver, a metropolitan area within British Columbia, Canada. Thus, the current study fills a gap in the literature by examining fear of crime on public transportation within Metro Vancouver. The current study also contributes to the existing literature by examining how the intersections of gender, age, and, race and ethnicity influence Asian women's experiences of fear of crime on public transportation in this jurisdiction.

In a study on neighbourhood safety, Loukaitou-Sideris (2006) defined fear as a diminished feeling of safety that may be real or perceived and may influence an individual's actions or behaviours. Perceived fear of crime and actual crime may have an indirect relationship where fear of crime may adversely affect people's lives despite an absence of a likelihood of victimization (Cozens et al., 2003; Currie et al., 2013; Yavuz et al., 2007). Existing research has examined how people experience fear of crime on public transportation. For example, Delbosc and Currie (2012) found that fear of crime influences public transportation users' feelings of safety, which are "believed to have a significant influence on public transport ridership" (p. 302)[1]. Public transportation systems create an environment where large clusters of people – including "a large proportion of demographically high-crime risk people [such as] teenagers, unattached males, [and those of] lower socioeconomic status" (Brantingham et al., 1991, p. 93) – come together and are forced into spaces for finite periods of time, providing "an opportunity structure for offenders to take advantage of" (Gallison & Andresen, 2017, p. 95). Fear of

[1] The researchers used the terms "public transportation users", "light rail riders", and "transit users" interchangeably throughout this paper to reflect the terminology that was used in the studies they referenced.

Published online
21 December 2021

Citation
Wong, E. (2021). Asian Women's Experience of Fear of Crime on Public Transportation in Metro-Vancouver. *CJUR*, *6*(2), 36-40.

Address correspondence to
emma_wong@sfu.ca

crime on public transportation increases due to the unpredictable nature and exposure that individuals experience in large clusters of people (Brantingham et al., 1991). Further, fear of crime on public transportation increases due to the belief that the presence of a rail station will compromise the safety of the surrounding areas and increase offender mobility, thereby transporting crime to nearby neighbourhoods (Billings et al., 2011; Ihlanfeldt, 2003).

Various researchers (Currie et al., 2013; Isom Scott, 2018; Pain, 2001) have identified the importance of examining the intersectionality of certain demographic variables when studying fear of crime on public transportation. The three most common categories of variables studied in the existing literature are: previous victimization, psychological factors, and demographic variables. An individual's perception of safety can be affected by past experiences of victimization, "observations of crime occurrences, or experiences that one has recounted by others" (Currie et al., 2013; Yavuz et al., 2007, p. 20). Currie et al. (2013) suggest that psychological factors such as familiarity with one's environment can influence feelings of safety. For example, feelings of anxiety and discomfort related to travelling on public transportation and the presence of unfamiliar passengers were found to be the "most influential factor driving negative feelings of personal safety on public transport" (Currie et al., 2013, p. 15). The literature has also suggested that fear of crime in public spaces may be higher for certain groups of people when considering demographic variables such as age, gender, and, race and ethnicity (Currie et al., 2013; Kim et al., 2007; Loukaitou-Sideris, 2014; Loukaitou-Sideris & Fink, 2009; Pain, 2001; Smith, 2008; Yavuz & Welch, 2010).

The impact of gender on fear of crime has been well-documented with several studies indicating that women report being more fearful of crime, including on public transportation (Pain, 2001; Vilalta, 2011; Yavuz & Welch, 2010). As a result, women may alter their travel patterns or utilize precautionary or risk-avoidant strategies (Loukaitou-Sideris & Fink, 2009). Studies have also documented the influence of race and ethnicity on people's experiences of fear of crime (Isom Scott, 2018; Pain, 2001; Yavuz & Welch, 2010). For example, Yavuz and Welch (2010) studied individual characteristics and discovered that ethnic minorities are "more likely to have lower perceived train safety" (pp. 2504-2506). However, studies have produced less knowledge about how the intersections of these variables influence experiences of fear of crime. Intersectionality can be understood as the convergence between social identities or characteristics such as racial and ethnic lines, gender, and age that may influence people's experiences of fear of crime and experiences of crime (Isom Scott, 2018; Pain, 2001). Isom Scott (2018) found that female youth of colour were more likely to report "experiencing or witnessing more threatening or violent encounters than their White counterparts" (p. 719), lending support to the notion that the intersections of multiple variables (i.e., age, gender, and, race and ethnicity) influence experiences of fear of crime.

METHODS

The present qualitative study fills a current gap in the literature by exploring how Asian women experience fear of crime on public transportation. Specifically, the study examines their experiences using the public transportation system in Metro Vancouver, which is governed by TransLink (TransLink, n.d.a). TransLink's public transportation system and accompanying Transit Police serve over 22 different jurisdictions, including 79 km of SkyTrain tracks, 69 km of West Coast Express tracks, and more than 1800 square km of bus service (TransLink, n.d.b; TransLink, n.d.d). Bus services are also overseen by the Coast Mountain Bus transit security team (TransLink, n.d.b). TransLink offers many security features on their SkyTrains, such as "the on-train passenger silent alarm, the on-train speakerphone, the in-station designated waiting areas, the in-stations emergency cabinets, and CCTV," in addition to employing SkyTrain attendants (STA) to assist in emergency responses and customer service (TransLink, n.d.b).

The 12 semi-structured interviews were conducted in English in early 2020. The data were inductively coded and analyzed for categorical codes that the researcher then grouped into emergent themes.

Sampling Procedure and Design

This study utilized criterion, convenience, and snowball sampling. Criterion sampling required participants to meet pre-defined inclusion criteria which stipulated that participants must be: 19 years of age or older, identify as female, identify as an ethnic minority, and currently use public transportation in Metro Vancouver. Semi-structured interviews were conducted so the researcher had a guide for each interview with the flexibility to deviate from the pre-determined interview questions when participants' responses led to additional avenues of exploration (DiCicco-Bloom & Crabtree, 2006; Hesse-Biber, 2017; Stuckey, 2013).

The sample was comprised of various ethnicities including Chinese, Filipino, Vietnamese, Indian, and more broadly Asian. Participants (N=12) ranged from 21 to 28 years of age and included full-time students, full-time workers, and students working part-time. Participants primarily utilized the bus and the SkyTrain, "a fully-automated, driverless, rapid transit system" (TransLink, n.d.c), with a single participant citing infrequent usage of the SeaBus. Participants used a mixture of the Canada Line, Expo Line, Millennium Line, and Evergreen Extension SkyTrain with no participants indicating regular or frequent usage of all four SkyTrain lines. Participants used bus lines in various cities such as Vancouver, Surrey, Richmond, and Burnaby.

Data Analysis

Interview transcripts were uploaded to NVivo 12 to assist in organization for analysis and coding. Participants were ensured confidentiality and assigned pseudonyms to anonymize the data. The data were inductively coded line by line, where a line was treated as a complete sentence or thought. The researcher assigned categorical codes to each line by creating a new code or assigning a pre-existing code and coded twice for accuracy before reviewing the codes to identify larger themes that emerged from the data. The researcher grouped similar codes together to assist in the identification of emergent themes. For example, codes such as lighting, police presence, presence of others, and STAs were grouped in the emergent theme *"factors that increase my feelings of safety"*.

RESULTS

Three main themes emerged from the data focusing on participants' feelings of safety and the factors that increase and decrease feelings of safety on public transportation. The first theme

that emerged from the data was *"I feel pretty safe while on [public] transportation"*. Most participants described feeling safe on public transportation. Jenna explained, "for the most part it's pretty safe. There [are some negative experiences I've had, which] I guess [are] really unavoidable with anything that's available to the public, but for the most part it's pretty safe".

The second theme that emerged from the data was *"factors that increase feelings of safety"*, including enhanced lighting and visibility, the presence of Transit Officials, the presence of others, travelling on the SkyTrain, and the structure and composition of the station. The first subtheme was *"lighting is a key factor in visibility, [it] changes my [feelings of] safety"*. Melany explained:

> *I think that lighting is a key factor in visibility, [it] changes my [feelings of] safety a lot [and poorly lit areas create a concern that] people aren't coming to check on that area as often… Also [sometimes] you just don't know [what could happen when] it's not as well lit.*

Notably, participants identified feeling safer in the presence of Transit Officials, including STAs and Transit Police, in the subtheme *"[when] Transit Officers come in you automatically feel a bit safer"*. Sara described how the presence of STAs increased her feelings of safety by having "someone to go to directly" while Jenna indicated that their visibility made her feel safer. Most participants also indicated feeling safer on the SkyTrain than the bus in the subtheme *"you just generally feel safer on the SkyTrain"*. For example, Raman stated, "I just feel like you [are] just generally safer on the SkyTrain. [There are] more security measures in place". Further, Jasmine explained, "I feel a bit safer when I'm at the SkyTrain station or on the SkyTrain rather than waiting at the bus stop or being on the bus". Additionally, participants noted that their feelings of safety were impacted by the composition, layout, and structure of SkyTrain stations and bus stops. Raman discussed how the appearance of older SkyTrain stations impacts her feelings of safety, stating:

> *[At] Surrey Central they've done a lot of construction there and it looks a lot nicer [whereas] King George is such an old station and they never try to make improvements at all and it's kind of become an attraction for violence.*

The last theme that emerged from the data was *"factors that decrease feelings of safety"*. Participants noted that factors such as travelling at night, past negative experiences, the neighbourhood they were travelling in, and their gender decreased their feelings of safety. Notably, Sara discussed avoiding travelling at night in the subtheme *"I don't really take [public transportation] at night"*, stating, "it's always really unnerving…I don't really take [public transportation] at night unless I have to, like for exams, or if I suddenly have to go out, but it's very rare for me to take it at night".

A few participants also noted that their gender decreased their feelings of safety in the subtheme *"[maybe] it's because I am a woman that I'm a little bit afraid"*. Shelby described how her fear is increased due to her gender, stating:

> *I feel like as a woman when you are engaged in [negative experiences with men such as unnecessary touching and repeated attempts at conversation] you have to be more conscious about how you are projecting to your surroundings. Rather than [for] a dude, I don't think when a guy is getting talked to [they just think of it as] an experience because there is no threat of anything happening to them. But, for a woman, I think that any experience where you don't know the person [it becomes about] how much information [you] share, [and] do they think I'm trying to flirt with them? I think that even when you're being nice to someone, they will take it as something else.*

DISCUSSION

The study explored how Asian women experience feelings of safety on public transportation in Metro Vancouver. Current literature has not adequately evaluated transit users' utilization of "precautionary measures" or how travelling alone versus travelling with others influences feelings of safety (Scott, 2003). Although some findings suggest female transit riders have an aversion to travelling alone at night (Kim et al., 2007), most of the support for this notion is found in campus safety literature that suggests individuals increase their usage of precautionary measures and behaviours, such as locking their car doors and not walking by strangers when travelling alone (Baker & Boland, 2011; Fletcher & Bryden, 2007).

Moreover, there is little known about how intersectionality (e.g., demographic variables such as age, gender, race and ethnicity, socioeconomic status, and previous victimization) influences experiences of fear of crime despite the literature acknowledging its importance. Interestingly, none of the participants identified their ethnic minority status as a factor that decreased their feelings of safety despite previous literature that suggests ethnic minorities and women experience higher rates of fear of crime compared to their counterparts (Pain, 2001; Vilalta, 2011; Yavuz & Welch, 2010). However, four participants identified feeling less safe as a result of their gender which is consistent with previous literature that has suggested women are more likely than men to report being fearful of crime (Pain, 2001; Vilalta, 2011; Yavuz & Welch, 2010). The finding that no participants identified their ethnic minority status as decreasing their feelings of safety may be partially explained by the fact that while all the participants visibly appear and identify as ethnic minorities, none of the participants wear religious clothing that would identify them as a minority. Additionally, it is possible that the level of ethnic diversity in Metro Vancouver influenced participants' experiences of feelings of safety in relation to their ethnic minority status. That is, given the ethnic diversity surrounding them, they may not have seen their ethnic minority status as an influencing factor that decreased their feelings of safety on public transportation.

Consistent with previous literature, participants indicated a greater fear of crime when travelling at night compared to travelling during the day (Badiora et al., 2015; Currie et al., 2013; Loukaitou-Sideris, 2006; Scott, 2003). Further, participants reported feeling safer in the presence of Transit Officials and in public transportation structures that followed Crime Prevention Through Environmental Design principles, as such features increase visibility by utilizing designs that promote natural surveillance in the structure of the transit system (Badiora et al., 2015; Billings et al., 2011; Cozens et al., 2004; Gallison, 2016; Gallison & Andresen,

2017; Ihlanfeldt, 2003; Loukaitou-Sideris, 2014; Vilalta, 2011; Yavuz & Welch, 2010). Participants indicated feeling safer on the SkyTrain compared to the bus, which is contrary to previous studies that have found higher levels of perceived bus safety (Currie et al., 2013; Yavuz et al., 2007) and studies that suggest feelings of safety remain consistent across different modes of transportation (Vilalta, 2011). It is unclear whether the train systems in studies conducted outside of Canada are comparable to the SkyTrain system in Metro Vancouver. Further, it is possible that bus systems outside of Metro Vancouver have stronger safety measures than trains, hence explaining the difference in findings.

CONCLUSION

The findings from the current study provide valuable insights into Asian women's feelings of safety on public transportation in Metro Vancouver, an understudied area of research. Considering the multiculturalism and ethnic diversity in Metro Vancouver, it is important to understand how an individual's gender or race and ethnicity may differentially impact their feelings of safety. These findings point to several key policy implications to improve transport users' feelings of safety and may be reflective of specific experiences and factors that influence feelings of safety for female and Asian transit users.

The policy implications resulting from this study are mainly directed at TransLink as this agency governs the majority of public transportation in Metro Vancouver. Participants indicated that their fear of crime was greater on the bus compared to the SkyTrain which may be partially explained by the presence of Transit Officials and the availability of different safety measures on SkyTrains, including the silent alarm. Combined, these findings suggest TransLink would benefit from increasing the presence of their Coast Mountain Bus transit security team and Transit Police along bus routes and strengthening the security features offered on buses to be similar to those on the SkyTrain. TransLink would further benefit from future research considering the specific factors or security features that promote feelings of safety (e.g., silent alarm). Future research should also explore how the intersections of gender, age, and, race and ethnicity impact fear of crime and experiences of crime on public transportation. This will lead to a better understanding of how one's race and ethnicity may differentially impact their feelings of safety in efforts to increase our understanding of the fear of crime and public transportation usage. Specifically, further evaluation is necessary to determine how the convergence of demographic variables influences experiences of fear of crime in comparison to individuals without intersections of gender, age, and, race and ethnicity.

The current study is not without limitations. Fear of crime was not examined in relation to specific bus routes or SkyTrain lines (e.g., Millennium, Expo, or Canada Lines) in Metro Vancouver. As such, the findings are limited due to data referring only generally to the SkyTrain, buses, and public transportation. The current study is also subject to methodological limitations. Due to time constraints, this study did not utilize triangulation, a method that can enhance the sincerity and credibility of research (Golafshani, 2003; Hesse-Biber, 2017). Further, the use of non-probability sampling makes the results non-generalizable. Nonetheless, this study provides an exploration of an under-researched area with thick, descriptive responses, providing a valuable contribution to the existing literature examining fear of crime on public transportation in Metro Vancouver. Insights from the Metro Vancouver transit system allow researchers worldwide to better understand how the intersections of gender, and, race and ethnicity influence Asian women's feelings of safety on public transportation.

CONFLICTS OF INTERESTS

The author declares no conflicts of interest.

The author would like to thank Dr. Danielle Murdoch for her "invaluable guidance and wisdom through the adaptation of the thesis to this reduced manuscript", and for her efforts and feedback.

REFERENCES

[1] Badiora, A. I., Ojewale, O. S., & Okunola, O. H. (2015). Perceived Risk and Fear of Crime in Public Transport Nodes: The Experience from Nigerian Transit Environment. *International Journal of Criminal Justice Sciences, 10*(2), 139–151.

[2] Baker, K., & Boland, K. (2011). Assessing safety: A campus-wide initiative. *College Student Journal, 45*(4), 683–699.

[3] Billings, S. B., Leland, S., & Swindell, D. (2011). The Effects of the Announcement and Opening of Light Rail Transit Stations on Neighborhood Crime. *Journal of Urban Affairs, 33*(5), 549–566. https://doi.org/10.1111/j.1467-9906.2011.00564.x

[4] Brantingham, P. J., Brantingham, P. L., & Wong, P. S. (1991). How Public Transit Feeds Private Crime: Notes on the Vancouver "Skytrain" Experience. *Security Journal, 2*(2), 91–95.

[5] Cozens, P., Neale, R., Hillier, D., & Whitaker, J. (2004). Tackling Crime and Fear of Crime While Waiting at Britain's Railway Stations. *Journal of Public Transportation, 7*(3), 23–41. https://doi.org/10.5038/2375-0901.7.3.2

[6] Cozens, P., Neale, R., Whitaker, J., & Hillier, D. (2003). Managing crime and the fear of crime at railway stations—a case study in South Wales (UK). *International Journal of Transport Management, 1*(3), 121–132. https://doi.org/10.1016/j.ijtm.2003.10.001

[7] Currie, G., Delbosc, A., & Mahmoud, S. (2013). Factors Influencing Young Peoples' Perceptions of Personal Safety on Public Transport. *Journal of Public Transportation, 16*(1), 1–19. https://doi.org/10.5038/2375-0901.16.1.1

[8] Delbosc, A., & Currie, G. (2012). Modelling the causes and impacts of personal safety perceptions on public transport ridership. *Transport Policy, 24,* 302–309. https://doi.org/10.1016/j.tranpol.2012.09.009

[9] DiCicco-Bloom, B., & Crabtree, B. F. (2006). The qualitative research interview. *Medical Education, 40*(4), 314–321. https://doi.org/10.1111/j.1365-2929.2006.02418.x

[10] Fletcher, P. C., & Bryden, P. J. (2007). Preliminary examination of safety issues on a university campus: Personal safetty practices, beliefs & attitudes of female faculty & staff. *College Student Journal, 41*(4), 1149–1162.

[11] Gallison, J. K. (2016). The line of crime: Dismantling fears and concerns of crime along Vancouver SkyTrain's Canada Line. *Security Journal, 29*(3), 485–500. https://doi.org/10.1057/sj.2013.42

[12] Gallison, J. K., & Andresen, M. A. (2017). Crime and Public Transportation: A Case Study of Ottawa's O-Train System. *Canadian Journal of Criminology and Criminal Justice, 59*(1), 94–122. https://doi.org/10.3138/cjccj.2016.E35

[13] Golafshani, N. (2003). Understanding Reliability and Validity in Qualitative Research. *The Qualitative Report, 8*(4), 597–607.

[14] Hesse-Biber, S. N. (2017). *The practice of qualitative research: Engaging students in the research process* (3rd ed.). Sage Publications Inc.

[15] Ihlanfeldt, K. R. (2003). Rail Transit and Neighborhood Crime: The Case of Atlanta, Georgia. *Southern Economic Journal, 70*(2), 273–294. https://doi.org/10.2307/3648969

[16] Isom Scott, D. A. (2018). Disentangling the Impact of Female Victimization Across Racial and Ethnic Lines. *Victims & Offenders, 13*(5), 711–737. https://doi.org/10.1080/15564886.2018.1468369

[17] Kim, S., Ulfarsson, G. F., & Todd Hennessy, J. (2007). Analysis of light rail rider travel behavior: Impacts of individual, built environment, and crime characteristics on transit access. *Transportation Research Part A: Policy and Practice, 41*(6), 511–522. https://doi.org/10.1016/j.tra.2006.11.001

[18] Loukaitou-Sideris, A. (2006). Is it Safe to Walk?1 Neighborhood Safety and Security Considerations and Their Effects on Walking. *Journal of Planning Literature, 20*(3), 219–232. https://doi.org/10.1177/0885412205282770

[19] Loukaitou-Sideris, A. (2014). Fear and safety in transit environments from the women's perspective. *Security Journal, 27*(2), 242–256. https://doi.org/10.1057/sj.2014.9

[20] Loukaitou-Sideris, A., & Fink, C. (2009). Addressing Women's Fear of Victimization in Transportation Settings: A Survey of U.S. Transit Agencies. *Urban*

Affairs Review, 44(4), 554–587. https://doi.org/10.1177/1078087408322874
[21] Pain, R. (2001). Gender, Race, Age and Fear in the City. *Urban Studies, 38*(5–6), 899–913.
[22] Perreault, S. (2008). *Visible minorities and victimization, 2004*. Statistics Canada. https://www150.statcan.gc.ca/n1/en/pub/85f0033m/85f0033m2008015-eng.pdf?st=LBVoLxZz
[23] Scott, H. (2003). Stranger Danger: Explaining Women's Fear of Crime. *Western Criminology Review, 4*(3), 203–214.
[24] Smith, M. J. (2008). Addressing the Security Needs of Women Passengers on Public Transport. *Security Journal, 21*(1–2), 117–133. https://doi.org/10.1057/palgrave.sj.8350071
[25] Stuckey, H. L. (2013). Three types of interviews: Qualitative research methods in social health. *Journal of Social Health and Diabetes, 01*(02), 056–059. https://doi.org/10.4103/2321-0656.115294
[26] TransLink. (n.d.a). *About Us*. TransLink. https://www.translink.ca/About-Us.aspx
[27] TransLink. (n.d.b). *Safety and Security*. TransLink. https://www.translink.ca/Rider-Guide/Safety-and-Security.aspx
[28] TransLink. (n.d.c). *SkyTrain*. TransLink. https://www.translink.ca/Schedules-and-Maps/SkyTrain.aspx
[29] TransLink. (n.d.d). *Transit Police*. TransLink. https://www.translink.ca/About-Us/Corporate-Overview/Operating-Companies/Transit-Police.aspx
[30] Vilalta, C. J. (2011). Fear of crime in public transport: Research in Mexico City. *Crime Prevention and Community Safety, 13*(3), 171–186. https://doi.org/10.1057/cpcs.2011.4
[31] Yavuz, N., & Welch, E. W. (2010). Addressing Fear of Crime in Public Space: Gender Differences in Reaction to Safety Measures in Train Transit. *Urban Studies, 47*(12), 2491–2515. https://doi.org/10.1177/0042098009359033
[32] Yavuz, N., Welch, E. W., & Sriraj, P. S. (2007). Individual and Neighborhood Determinants of Perceptions of Bus and Train Safety in Chicago, Illinois: Application of Hierarchical Linear Modeling. *Transportation Research Record, 2034*(1), 19–26. https://doi.org/10.3141/2034-03