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The prevalence of distress, depression, anxiety, and substance use issues among Indigenous post-secondary students in Canada

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Abstract

This study aimed to estimate the prevalence of mental illness and substance use among Indigenous students attending Canadian post-secondary institutions. We obtained data from the National College Health Assessment - American College Health Association Spring 2013 survey, which includes 34,039 participants in 32 post-secondary institutions across Canada. We calculated prevalence estimates with 95% confidence intervals (CI). We compared Indigenous and non-Indigenous students using age- and sex-adjusted prevalence ratios (PR) obtained from Poisson regression models. Of the total sample, 1,110 (3.3%) post-secondary students self-identified as Indigenous. Within the past 12 months, Indigenous students had higher odds of intentionally injuring themselves (PR = 1.53, 95% CI = 1.27–1.84), seriously considering suicide (PR = 1.32, 95% CI = 1.12–1.56), attempting suicide (PR = 1.74, 95% CI = 1.16–2.62), or having been diagnosed with depression (PR = 1.26, 95% CI = 1.08–1.47) or anxiety (PR = 1.18, 95% CI = 1.02–1.35) when compared with non-Indigenous students. Indigenous students also had higher odds of having a lifetime diagnosis of depression (PR = 1.31, 95% CI = 1.17–1.47) when compared with non-Indigenous students. Indigenous students were more likely to report binging on alcohol (PR = 1.10, 95% CI = 1.02–1.19), using marijuana (PR = 1.21, 95% CI = 1.06–1.37), and using other recreational drugs (PR = 1.32, 95% CI = 1.06–1.63) compared to non-Indigenous students. This study demonstrates that Indigenous students at post-secondary institutions across Canada experience higher prevalence of mental health and related issues compared to the non-Indigenous student population. This information highlights the need to assess the utilization and ensure the appropriate provision of mental health and wellness resources to support Indigenous students attending post-secondary institutions.

Keywords

Indigenous, Aboriginal, college students, university students, mental health

Introduction

As part of Canada's journey toward reconciliation with Indigenous people, educational institutions have been called on to increase the numbers of Indigenous students pursuing post-secondary education. The recommendations of the Truth and Reconciliation Commission (2015) particularly note the need for more Indigenous health professionals, as a way to improve the ability of the health care system to meet the health needs of Indigenous patients. Yet are post-secondary institutions meeting the needs of Indigenous students, and thus able to make good on these commitments?

Research has shown that post-secondary students are a highly stressed population. In recent years, the mental health status of post-secondary students has been identified as an important determinant of student academic success (McEwan & Downie, 2013), but also an area of mounting concern. Evidence suggests that a

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growing number of students may be experiencing and seeking help for these mental health problems, and that these problems are of a higher degree of complexity than previously noted at post-secondary institutions (Hunt & Eisenberg, 2010; Storrie, Ahern, & Tuckett, 2010). This has led post-secondary institutions across Canada and elsewhere to pay increasing attention to ways to promote mental health and to more effectively prevent and treat mental illness in their student populations (Canadian Association of College & University Student Services and Canadian Mental Health Association, 2013). As a result, student mental health is an issue that is becoming more openly discussed on campuses across Canada and beyond.

Although this increased concern for the mental wellness of students shown in post-secondary institutions demonstrates important shifts in attitudes towards mental health, little attention has been paid to the specific challenges of Indigenous students. Indigenous students may be particularly at risk for mental health stress, given the wide range of other stressors that they are facing. The demographic profile of Indigenous students includes a range of risk factors for mental stress, including relocating from their home community, and coming from a lower socioeconomic status than the general student population (Timmons et al., 2009). Steinhauer and Lamouche (2015) have identified a significant concern for Indigenous students, asserting that if institutions continue to offer "training to Indigenous peoples without a deeper understanding of the Indigenous connections to ceremony, protocols, language, spiritual teachings, community, stories, and the impact of history, they will repeat the cycle of colonization and assimilation" (Steinhauer & Lamouche, 2015, p. 152). Although post-secondary institutions across Canada are starting to address these assimilative educational approaches, Indigenous ways of knowing and being still have a limited influence on curriculum or university culture. For this reason, we anticipate that the mental health status of Indigenous students may be affected negatively by their experiences in post-secondary institutions.

There is good reason for concern. The Canadian Campus Survey (Adlaf, Demers, & Gliksman, 2005) involving 40 universities across the country reported that nearly one-third of undergraduate students experienced elevated levels of psychological distress, and a similar proportion engaged in hazardous or harmful patterns of drinking. More recently, a number of Canadian colleges and universities have participated in the American College Health Association's National College Health Assessment (ACHA-NCHA II), a survey of self-reported mental health, addictions, and other health issues. On a national level, combined statistics from 32 Canadian post-secondary institutions revealed that in the past year, 53.8% of students had felt hopeless, 10% had a diagnosis of depression, 0.8% had been diagnosed with substance abuse or addiction, and 1.3% had attempted suicide (American College Health Association, 2013). Notably, these students reported that mental health concerns were having a significant negative impact on their academic performance (MacKean, 2011).

A subgroup of students who may have unique mental health issues and needs are Indigenous peoples[1] attending Canadian post-secondary institutions. Indigenous students are enrolling and completing post-secondary studies at an increasing rate, with twice as many graduating with degrees compared to a decade ago (Statistics Canada, 2011a). Post-secondary education is considered a critical element towards improving the health and socio-economic status of Indigenous peoples in Canada (Mayes, 2007), and has been referred by Indigenous leaders/scholars as the "new buffalo" – a reference to the potential of post-secondary education to improve the situation of Indigenous peoples, in a similar manner to the sustenance provided historically by the buffalo (Stonechild, 2006). However, Indigenous student retention remains a concern (Mayes, 2007).

On a variety of mental health indicators, Indigenous peoples appear to be worse off in comparison to non-Indigenous Canadians (Government of Canada, 2006). Indigenous peoples are more likely to experience psychological distress (The First Nations Information Governance Centre, 2012) and symptoms of depression (Lemstra et al., 2011; Statistics Canada, 2011b) as compared to non-Indigenous Canadians. Indigenous peoples, particularly youth, are also more likely to commit suicide compared to the general population. First Nations youth are 5 to 6 times more likely to commit suicide than non-Indigenous youth (Government of Canada, 2006), and Inuit youth are 11 times more likely (Oliver, Peters, & Kohen, 2012).

These mental health inequities are understood to be the result of a combination of the classic socioeconomic determinants of health (e.g., education, poverty), as well as Indigenous-specific factors that include colonization, globalization and migration, loss of traditional languages, culture, and connection to the land, as well as racism and marginalization (Greenwood, de Leeuw, Lindsay, & Reading, 2015; King, Smith, & Gracey, 2009). It is important to recognize that these mental health issues facing Indigenous people are deeply rooted in Canada's colonial history. The visible outcomes of mental distress among Indigenous peoples indicated in the statistics above are based on structural factors of health, of which "deeply embedded determinants represent the historical, political, ideological, economical and social foundations, from which all other determinants evolve" (Reading, 2015, p. 5). Indigenous

peoples globally experience the most significant health disparities, yet "colonialism has yet to be fully and consistently accounted for as a significant determinant of health" (de Leeuw, Lindsay, & Greenwood, 2015, p. 11).

Although the colonial experience creates common trends in Indigenous health globally, it is important to recognize the locally specific contexts that lead to significant differences. There is a wide variation in suicide rates across different First Nations communities. Many First Nations communities have no incidents of youth suicide, with evidence suggesting that greater community control over health services (Chandler & Lalonde, 1998), cultural continuity, (Chandler & Lalonde, 1998) and native language use (Hallett, Chandler, & Lalonde, 2007) are associated with lower suicide rates. First Nations and Inuit peoples are more likely to abstain from alcohol; however, those who do consume alcohol are more likely to engage in heavy drinking and be hospitalized for alcohol-related issues (Government of Canada, 2006; The First Nations Information Governance Centre, 2012). First Nations people also have a higher one-year prevalence of marijuana and illicit substance use than the general population (First Nations Centre, 2005). Socially destructive behaviors such as substance abuse should be understood as a destructive yet explainable coping mechanism in the context of the overwhelming onslaught of stresses facing Indigenous people (Walters, Simoni, & Evans-Campbell, 2002). Concomitant with these higher rates of self-harm, Indigenous peoples have been found to have a higher utilization of mental health services, which likely reflects this increased prevalence of mental illness and substance use disorders in this population (Government of Canada, 2006).

It is currently unknown whether these disparities in mental health and addictions that we observe in Indigenous populations extend to Indigenous students attending Canadian post-secondary institutions. In one of the only Canadian studies to investigate this subgroup, Currie et al. (2011) found that 31.7% of Indigenous university students in Alberta met criteria for high-risk drinking and 10% had potential alcohol dependence. These numbers are comparable to those found in the general Canadian post-secondary student population (Adlaf et al., 2005). An earlier study performed at Dalhousie University in Halifax, Nova Scotia, found that a combined group of First Nations and Afro-Canadian students exhibited greater anxiety, reported more emotional problems, and had lower levels of academic achievement than Caucasian students (Gold, Garner, Murphy, & Weldon, 1980). However, the knowledge drawn from this study done in 1980 is limited by its small and mixed sample, and it may not be applicable to current times given the significant change in the participation of Indigenous peoples in post-secondary education, with 9.8% of Indigenous Canadians, aged 25-64 years old, having obtained a university degree by 2011 (Statistics Canada, 2013). There are no current data available on the prevalence of mental illness and substance use disorders among Indigenous post-secondary students in Canada.

The purpose of this study was to estimate the prevalence of mental health and substance use problems among Indigenous students attending Canadian post-secondary institutions, and to compare the prevalence between Indigenous and non-Indigenous students. This study aims to fill some of the key research gaps, as well as identify priority issues for Indigenous students' mental health and wellbeing.

Methods

This study involved secondary analysis of the data from the Canadian Spring 2013 ACHA National College Health Assessment (American College Health Association, 2013). This survey initially included 34 self-selected Canadian post-secondary institutions with 38,171 surveys completed; however only schools that surveyed all students or used a random sampling technique as well as agreed to have their information included were available for the final analysis. This resulted in a total of 32 institutions and 34,039 students. All schools collected information via the ACHA-NCHA web survey, administered between January and May 2013. Fifteen of the institutions had campuses with greater than 20,000 students, and 12 of the campuses were located in a very large city (population greater than 500,000). Twenty-six institutions offered four-year degrees or above, while the remaining six institutions offered both two-year and four-year degrees. The ACHA-NCHA survey methodology used the student email list of each university to select participants using simple random sampling. The mean response rate was 20.4% (standard deviation = 6.1%) across the participating institutions. Before completing our analysis, we confirmed with the Health Sciences Research Ethics Board at Western University that we would not require a research ethics board review, as we were working with anonymized aggregate data, and we could not link the data.

Measures

Demographics. Survey respondents were asked to indicate their age, gender, sexual orientation, year in school, enrolment status, relationship status, marital status, and current residence. Participants were also asked about their race/ethnicity with the question "What is your racial or ethnic identification? (select all that apply)". Fourteen options were available,

including ''Aboriginal (Inuit, Métis, North American Indian, etc.; status or non-status)''. Respondents had the option of selecting multiple ethnic identities and we compared those who selected Aboriginal with those who did not select Aboriginal. It should be noted that over 60% of the Aboriginal group also self-identified with other ethnic groupings and that the dichotomy we used does not capture the large degree of heterogeneity in the ethnic identities of Indigenous peoples. We also conducted a sensitivity analysis that compared Aboriginal students to those who selected only ''White''.

12-month prevalence of Psychological Distress. Participants answered 8 questions relating to feelings of hopelessness or loneliness. These questions were developed by a multi-disciplinary team and piloted in 1998–1999 for the ACHA-NCHA. The assessment used in our analysis (Spring 2013), is the 3rd iteration. The ''psychological distress'' questions in our paper, were originally combined with questions regarding self-harm and suicidal thoughts. For the purpose of our analysis we have separated the themes of ''psychological distress'' from themes of self-harm and suicidal ideation. We then constructed a binary variable that included not in the past 12 months (combined ''No, never'' and ''No, not in the last 12 months'' responses) and yes within the last 12 months (combined responses ''Yes, in the last 2 weeks'', ''Yes, in the last 30 days'' and ''Yes, in the last 12 months''). Details available in Appendix 1 (Appendix 1 and 2 can be found online with this article).

12-month prevalence of Self-Harm and Suicidal Behaviours. Participants were asked three questions relating to self-harm: whether they had intentionally injured themselves, had seriously considered suicide, and had they attempted suicide. We constructed a binary variable that included not in the past 12 months (combined ''No, never'' and ''No, not in the last 12 months'' responses) and yes within the last 12 months (combined responses ''Yes, in the last 2 weeks'', ''Yes, in the last 30 days'' and ''Yes, in the last 12 months''). Details available in Appendix 1.

Current Alcohol Use and Binge Drinking. Participants were asked ''Over the last two weeks, how many times have you had five or more drinks of alcohol at a sitting?'' We constructed a binary variable to indicate either having not engaged in binge drinking (five or more alcoholic drinks during one sitting) with the past 2 weeks or having binged one or more times within the past 2 weeks.

Current Marijuana and Other Substance Use. In regard to marijuana and other substance use, participants were asked ''Within the last 30 days, on how many days did you use . . .?'' They could indicate answers from ''never used'', ''have used, but not in last 30 days'', ''1-29 days'', or ''used daily''. Other substance use included cocaine, methamphetamines, other amphetamines, sedatives, hallucinogens, anabolic steroids, opiates, inhalants, MDMA, other club drugs and other illegal drugs. We combined responses for these substances into the single category of 'other substance use' because of the relatively low reported rates across the individual items. We constructed a binary variable to indicate either having used in the last 30 days (''1-2 days'' up to ''used daily'') or not having used in the last 30 days (''never used'', ''have used, but not in last 30 days''). Details available in Appendix 2.

Diagnosis of Depression and/or Anxiety within previous 12-month period. The survey asked the question, ''Within the last 12 months, have you been diagnosed or treated by a professional for any of the following?'' We focused on the responses for the two common mental disorders of depression and anxiety. Participants were able to answer by selecting either one of the 6 options, ''No'', ''Yes, diagnosed but not treated'', ''Yes, treated with medication'', ''Yes, treated with psychotherapy'', ''Yes, treated with medication and psychotherapy'', and ''Yes, other treatment''. We constructed a binary variable to indicate having been diagnosed in the past 12 months (irrespective of whether or what type of treatment was received) or not diagnosed within the last 12 months.

Lifetime diagnosis of Depression. Participants were asked the question ''Have you ever been diagnosed with depression?'' and had the option to answer ''no'' or ''yes''.

Data Analysis

We calculated prevalence estimates and corresponding 95% confidence intervals (CI) based on the binomial distribution. We used Poisson regression models with robust variance to estimate prevalence ratios (PRs), adjusted for age and sex, as these models are considered more accurate than logistic regression when prevalence estimates are obtained from cross-sectional data (Barros & Hirakata, 2003). We present the results as PRs for Indigenous students compared to Non-Indigenous students, and 95% CIs that do not include unity are considered statistically significant.

Results

A total of 34,039 participants responded to the survey, of whom 1,110 (3.3%) self-identified as Indigenous.

Table 1. Descriptive characteristics of non-Aboriginal and Aboriginal post-secondary students survey respondents.

Variable	Value	Non-Aboriginal (n = 32,929)	Aboriginal (n = 1,110)
Mean Age (years)	–	22.83	24.83
Age Standard Deviation (years)	–	5.77	8.29
Gender	Female (%)	68.23	75.18
	Male (%)	31.56	24.28
	Transgender (%)	0.21	0.54
Sexual Orientation	Heterosexual (%)	91.02	86.30
	Gay/Lesbian (%)	2.47	2.72
	Bisexual (%)	4.06	8.17
	Unsure (%)	2.44	2.81
Year in School	Undergraduate (%)	84.07	86.01
	Graduate/Professional (%)	14.61	10.26
	Not Seeking Degree (%)	0.43	1.18
	Other (%)	0.89	2.54
Enrollment Status	Full-Time (%)	92.61	90.14
	Part-Time (%)	6.56	9.05
	Other (%)	0.83	0.81
Relationship Status	Not In a Relationship (%)	48.52	40.45
	Relationship – Not Cohabitating (%)	33.90	29.68
	Relationship – Cohabitating (%)	17.58	29.86
Marital Status	Single (%)	82.61	68.81
	Married/Partnered (%)	12.93	22.39
	Separated (%)	0.47	1.27
	Divorced (%)	0.64	1.54
	Other (%)	3.35	5.98
Current Residence	On Campus Housing* (%)	15.33	14.75
	Parent/Guardian Home (%)	30.80	19.37
	Off Campus Housing (%)	45.76	48.78
	Other (%)	8.11	17.10

* "On Campus house" refers to Campus residence, fraternity/sorority, or other campus housing grouped together.

The majority of all student respondents were at the undergraduate level and enrolled full time. Indigenous students were slightly older and more likely to be female when compared with non-Indigenous students. Of note, Indigenous students were more likely to be cohabiting with their partner (29.86% vs. 17.58%), more likely to be married (22.39% vs. 12.92%), and less likely to be living at a Parent/Guardian's home (19.37% vs. 30.80%). Although it is important to highlight these differences, a comprehensive examination of additional factors associated with observed trends is beyond the scope of our objectives. Sociodemographic details for Indigenous and non-Indigenous students are presented in Table 1.

The levels of psychological distress were high across all students, ranging from 41.6% of students reporting feelings of depression that impaired functioning (37.4% for non-Indigenous students), to 91.4% of students reporting feeling overwhelmed (89.2% for non-Indigenous) (Table 2). The adjusted prevalence ratios were statistically higher for Indigenous students compared to non-Indigenous students across nearly all indicators of psychological distress. In particular, Indigenous students were 11% more likely to report feelings of depression that impaired functioning (PR = 1.11, 95% CI = 1.03–1.19) and were 17% more likely to report feeling overwhelming anger (PR = 1.17, 95% CI = 1.10–1.24). The high rates of psychological distress are consistent with recently released 2016 NCHA post-secondary data for the province of Ontario (not stratified by race), which indicated 61.4% felt hopeless within the last 12 months, 89.2% felt overwhelmed within the last 12 months, and 87.8% felt exhausted within the last 12 months (American College Health Association, 2016).

Table 2. Prevalence of mental health outcomes of non-Aboriginal and Aboriginal post-secondary students survey respondents.

	Non-Aboriginal Students		Aboriginal Students			
Mental Health Indicator	Prevalence	95% CI	Prevalence	95% CI	Adjusted PR*	95% CI
Psychological Distress: Have you ever... (within the past 12 months)						
Felt things were hopeless	53.75%	53.21–54.30%	55.42%	52.43–58.37%	1.05	0.997–1.11
Felt overwhelmed by all you had to do	89.22%	88.88–89.56%	91.44%	89.64–93.02%	1.03	1.01–1.04
Felt exhausted (not from physical activity)	86.87%	86.49–87.23%	89.07%	87.08–90.85%	1.02	1.0003–1.04
Felt very lonely	63.84%	63.32–64.37%	66.82%	63.96–69.59%	1.07	1.02–1.11
Felt very sad	68.40%	67.89–68.90%	72.42%	69.69–75.04%	1.06	1.02–1.10
Felt so depressed that it was difficult to function	37.38%	36.85–37.90%	41.58%	38.65–44.55%	1.11	1.03–1.19
Felt overwhelming anxiety	56.33%	55.79–56.87%	61.01%	58.07–63.90%	1.08	1.03–1.13
Felt overwhelming anger	42.00%	41.46–42.54%	48.60%	45.61–51.59%	1.17	1.10–1.24
Self-Harm: Have you ever... (within the past 12 months)						
Intentionally cut, burned, bruised or injured yourself	6.47%	6.21–6.74%	9.39%	7.73–11.26%	1.53	1.27–1.84
Seriously considered suicide	9.39%	9.07–9.71%	11.80%	9.96–13.85%	1.32	1.12–1.56
Attempted suicide	1.28%	1.16–1.41%	2.08%	1.32–3.10%	1.74	1.16–2.62
Current Alcohol & Substance Use (last 30 days)						
Alcohol: Current Use	70.84%	70.34–71.33%	70.74%	67.96–73.41%	1.00	0.96–1.03
Alcohol: Binge Drinking	36.02%	35.50–36.54%	36.99%	34.13–39.92%	1.10	1.02–1.19
Marijuana	15.97%	15.58–16.37%	17.92%	15.70–20.31%	1.21	1.06–1.37
Other Recreational Substances	5.60%	5.35–5.85%	7.30%	5.84–8.99%	1.32	1.06–1.63
Prior Psychiatric Diagnoses						
Diagnosis of Depression in Previous 12-Months	9.85%	9.52–10.17%	14.12%	12.12–16.31%	1.26	1.08–1.47
Lifetime Diagnosis of Depression	16.01%	15.61–16.42%	24.54%	22.00–27.21%	1.31	1.17–1.47
Diagnosis of Anxiety in Previous 12-Months	12.14%	11.79–12.50%	15.90%	13.79–18.19%	1.18	1.02–1.35

CI: Confidence Interval.
**Adjusted Prevalence Ration (PR) for age and gender.*

Indigenous students were significantly more likely than non-Indigenous students to report receiving a diagnosis of depression within the past 12 months (PR = 1.26, 95% CI = 1.08–1.47), a lifetime diagnosis of depression (PR = 1.31, 95% CI = 1.17–1.47), or a diagnosis of anxiety within the past 12 months (PR = 1.18, 95% CI = 1.02–1.35). Indigenous students also had a higher prevalence of self-harm behaviour across all indicators, including intentional self-injury (PR = 1.53, 95% CI = 1.27–1.84), having seriously considered suicide (PR = 1.32, 95% CI = 1.12–1.56), and suicide attempts within the past 12 months of the survey (PR = 1.74, 95% CI = 1.16–2.62) (Table 2).

Indigenous students were also significantly more likely to report binge drinking (PR = 1.10, 95% CI = 1.02–1.19), marijuana use within the past 30 days (PR = 1.21, 95% CI = 1.06–1.37), and other substance use within the past 30 days (PR = 1.32, 95% CI = 1.06–1.63) when compared with non-Indigenous students. There was no difference in the prevalence of alcohol use within the past 30 days between Indigenous and non-Indigenous students (Table 2).

Sensitivity analysis findings were largely similar when we used a ''White'' comparison group, with some notable differences. In regards to psychological distress, ''feeling things were hopeless'' became statistically significant (PR: 1.11, 95% CI: 1.06–1.18), while ''feeling overwhelmed'' (PR: 1.00, 9% CI: 0.98–1.02) and ''felt exhausted'' (PR: 1.00, 95% CI: 0.98–1.02) became statistically insignificant. The magnitude of association for having attempted suicide within the 12 months increased (PR = 2.26, 95% CI = 1.50–3.42). Current alcohol use became less likely in the past 30 days (PR = 0.88, 95% CI = 0.85-0.91). Also, having been diagnosed with anxiety within the past 12 Months was no longer statistically significant (PR: 1.05, 95% CI: 0.91–1.21).

Discussion

Our study findings suggest that Indigenous post-secondary students within Canada are at increased risk for psychological distress, common psychiatric diagnoses of depression and anxiety, suicidal ideation and behaviours and substance use including binge drinking. The 3.3% of students who self-identified as Indigenous students was lower than the Canadian Indigenous population estimate of 4.4% by the National Household Survey in 2011 (Statistics Canada, 2011a). It is difficult to know whether we may be underestimating the Indigenous population on post-secondary campuses through a self-selection bias, as it likely we have been underestimating our total Indigenous population in Canada through various sampling biases (Smylie & Firestone, 2015). Information on Indigenous student population on post-secondary campuses is not routinely collected or published, making comments more difficult.

When comparing the indicators of psychological distress, Indigenous students were more likely to report all symptoms, with the exception of 'felt hopeless'. However, it should be noted that the 95% limit lower confidence intervals for many of the indicators of psychological distress were close to overlapping with the results from the non-Indigenous students, with the exception of 'feeling overwhelming anger'. Therefore, the clinical or real-world significance of these findings is uncertain as it may suggest that markers of psychological distress are, for the most part, similar to what non-Indigenous students experience. This does not negate the issue that post-secondary psychological distress remains an important issue affecting all students, with rates of 91% and 89% feeling overwhelmed, and 55% and 54% reporting feelings of hopelessness over the past 12 months among Indigenous and non-Indigenous students respectively. This would support information from The First Nations Regional Health Survey 2008/2010, published in 2012, revealing that 50.7% of First Nations adults living in First Nation communities reported moderate to high levels of psychological distress, in comparison to 33.5% of the general Canadian population (First Nations Information Governance Centre, 2012).

Our findings indicate that Indigenous students used alcohol at a similar frequency as non-Indigenous students, but were more likely to engage in binge drinking. However, it should be noted the definition of binge drinking within Indigenous Canadian Culture has not been established or validated. The consumption of five drinks within Indigenous Canadian post-secondary school culture may reflect different ideas regarding what it means to binge, when compared with non-Indigenous students. This higher likelihood of binge drinking is in line with previous research on this topic to date. A 1984 study from Oklahoma, USA, that found American Indian college students self-reported higher drinking related problems, including being arrested or interfering with their daily functioning, when compared with Caucasian students(Hughes & Dodder, 1984). A study by Currie et al. (Currie et al., 2011) in 2011, reported 48.3% of a sample ($n = 60$) of Indigenous post-secondary students in Alberta admitted to consuming 5–9 drinks on a bi-weekly or greater basis and had experienced alcohol related blackouts, which is higher than the rates calculated in our study. However, the Currie et al. study also suggests that Indigenous post-secondary students who maintain their cultural identity had reduced risk of alcohol problems (Currie et al., 2011).

Our findings indicate that a greater proportion of Indigenous students report marijuana use than non-Indigenous students, which is in contrast to previous findings from the US (Ward & Ridolfo, 2011). However, the same study found that Native American college students reported higher illicit drug use (not including cannabis) rates than non-Native students (Ward & Ridolfo, 2011). This is consistent with our findings of a higher use of substances other than marijuana within the Indigenous population attending post-secondary schools in Canada.

This is the first study to present data on the prevalence of self-reported self-harm and suicidal behaviours among Indigenous post-secondary students in Canada. Indigenous students are more likely to report acts of self-harm, suicidal ideation, and suicide attempts within the past 12 months compared to non-Indigenous students. Interestingly, the First Nations Regional Health Survey notes that higher education levels among First Nations Peoples are associated with an increased likelihood of suicidal thoughts compared to those with only a high school diploma (First Nations Information Governance Centre, 2012). This is in contrast with 2015 Canadian data suggesting that Inuit peoples who died by suicide were less likely to have completed junior high school, or high school and/or greater education levels (Chachamovich et al., 2015). Our finding is also in line with general population data, which indicates that Indigenous people are twice as likely to die by suicide than the non-Indigenous population (Government of Canada, 2006). Our study is also supported by the 2012 Aboriginal Peoples Survey which indicates Aboriginal youths (18–25 years old) were more likely to have had suicidal thoughts within the past year (11%) or within their lifetime (27%), compared with non-Aboriginal youths (5% for past year and 15% for lifetime history of suicidal thoughts) (Kumar & Nahwegahbow, 2016). This is in contrast to a US study, which found that rates of suicidal ideation among Native American

post-secondary students were comparable with non-Native American students (Scheel, Prieto, & Biermann, 2011). However, these survey data on Indigenous suicide do not disaggregate by community, and previous studies have shown significant variation across First Nations communities. Factors which may reduce suicide risk for both youth and adult Canadian Indigenous peoples include First Nations communities that are more culturally connected and have more autonomy over educational services, health services, and fire and police services (Chandler & Lalonde, 1998; Chandler & Lalonde, 2008).

Our study indicates that a greater proportion of Indigenous students had been previously diagnosed with depression or anxiety, which is consistent with a study involving Mi'kmaq. First Nations People attending university in Halifax, who also had increased anxiety and emotional problems when compared to controls (Gold et al., 1980). A study by Iwata and Buka (Iwata & Buka, 2002) compared depressive symptoms between Native Americans, Anglo-Americans, East Asians, and South Americans attending post-secondary schools and found that Native Americans were more likely to have depressive symptoms than the other ethnic groups.

Our study demonstrates that there are unique mental health issues Indigenous people face when attending post-secondary education. Further research would need to be carried out to determine those specific challenges, which could range from disconnection from community, culture and family to factors related to the environment on campuses. This suggests that universities may need to explore how best to provide mental wellness supports and activities in addition to mental health services to meet the needs of this population. Past research demonstrates that culturally specific supports and services are preferred by Indigenous students and may be more effective in mitigating mental health and substance use problems (Currie et al., 2011). However, the same researchers have also shown how students who consider themselves traditional or cultural Indigenous persons may experience high rates of racial discrimination across a range of settings, and that these experiences are commonly associated with feelings of helplessness and hopelessness (Currie, Wild, Schopflocher, Laing, & Veugelers, 2012). An American study found that Indigenous post-secondary students who experienced suicidal ideation preferred to obtain help from a professional of Native American background (Scheel et al., 2011). Strengthening traditional Indigenous practices was also felt to be a protective factor for suicide among Native Alaskan university students (DeCou, Skewes, & López, 2013). Furthermore, a 2013 qualitative study found that Alaskan Natives attending college felt better when able to discuss their experiences surrounding suicide, as some communities did not openly discuss suicide (DeCou, Skewes, López, & Skanis, 2013). However, it remains unclear whether studies of Native American students in the US can be extrapolated to Indigenous students in Canada. More research on the risk factors and effective treatment approaches for this sub-population is necessary.

Our study presents the first Canadian data demonstrating a higher prevalence of symptoms associated with depression and anxiety as well as substance use issues among Indigenous students attending post-secondary education. It should be noted self-reporting of an increased number of symptoms does not necessarily translate into more mental health diagnoses nor does it mean more Indigenous students would seek treatment. However, the findings that Indigenous students were more likely to have been diagnosed with an anxiety or depressive disorder within the past 12 months, does imply an increase in prevalence for those specific disorders as well as the assumption that help was sought from a trained medical professional, who would have given the diagnosis. Our findings are strengthened by a large sample and the inclusion of multiple institutions across the country. However, participation in the survey was voluntary, and the overall response rate was low at 20%, which limits the representativeness of our data.

Additionally, all indicators of mental health and substance use problems were based on self-report measures, and there may be differences between Indigenous and non-Indigenous students in the propensity to report this type of sensitive information. The potential differences between how different ethnic groups answer self-report questionnaires, and the cultural sensitivity for the Canadian ACHA National College Health Assessment has not been established. A 2012 study by Bombak & Bruce found that, in general, North American Indigenous populations, self-report worse health than the general population (Bombak & Bruce, 2012). They report that self-report health surveys can be valid across multiple ethnicities, but that more research is particularly need in assessing validity for Indigenous groups. Also, as data collection occurred in the spring semester (January to May) the data would not have captured students who started in the fall semester, but left school because of a mental health, addiction, or other issue.

Conclusion

Indigenous students attending Canadian post-secondary institutions are more likely to experience mental health issues, including a diagnosis of depression or anxiety, increased self-harm, suicidal ideation, and suicide attempts, and higher rates of binge drinking, marijuana

and other substance use compared to their non-Indigenous peers. There is a need for research regarding culturally appropriate services and supports within post-secondary academic settings to address the mental health needs of this sub-population. Although the available evidence suggests that the provision of mental health services by individuals with similar cultural backgrounds or in culturally supportive settings may improve access to mental health services and be protective against mental health concerns, the capacity for and availability of such resources varies widely across the country. There are efforts underway to recruit and retain more Indigenous students into health-related professions, such as medicine, nursing, counselling, and social work, which can contribute to the ability of Indigenous students to access Indigenous health care professionals. For example, in the US, Dartmouth College has a Native American Program which focuses on recruitment and retention through promoting cultural events, as well as having a place for Native Americans to stay while enrolled (Dartmouth College, 2018). Several Canadian post-secondary schools have institution-specific spaces, such as the University of British Columbia, which has the First Nations House of Learning, the University of Victoria, which has the First Peoples House to create safe spaces for Indigenous students on campus, and the University of Western Ontario, which has Indigenous Services (University of British Columbia, 2018; University of Victoria, 2018; University of Western Ontario, 2018). In addition, this study points to the need for post-secondary institutions to create a more welcoming environment for Indigenous students through initiatives such as integrating traditional healers and elders within campus life, as well as increasing cultural competency training for faculty, students and mental health care professionals. These changes are part of the recommendations of Canada's Truth and Reconciliation, specifically the following Calls to Action:

> #22: We call upon those who can effect change within the Canadian health-care system to recognize the value of Aboriginal healing practices and use them in the treatment of Aboriginal patients in collaboration with Aboriginal healers and Elders where requested by Aboriginal patient.
> #23: We call upon all levels of government to: i. Increase the number of Aboriginal professionals working in the health-care field. ii. Ensure the retention of Aboriginal health-care providers in Aboriginal communities. iii. Provide cultural competency training for all healthcare professionals (Truth and Reconciliation Commission, 2015).

Efforts underway include the building of Indigenous students' spaces like the First Peoples House at the University of Victoria and the Sty-Wet-Tan Longhouse at the University of British Columbia and the introduction of mandated Indigenous studies courses for all students at Lakehead University and the University of Winnipeg (Macdonald, 2015). Further research should be done to explore why Indigenous students face such high levels of mental health and substance use issues at post-secondary institutions, and to help identify effective strategies for promoting mental health and wellness and improving the treatment of mental health and substance use issues and for of Indigenous post-secondary students. Such research should specifically explore the implementation and impact of recent efforts to create Indigenous spaces, cultural supports and increased awareness of Indigenous issues among students and faculty across Canadian campuses.

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Note

1. A note on terminology: There can be confusing terminology regarding Indigenous peoples of Canada and the United States (US). In Canada, as defined by the Constitution Act of 1982, they are referred to collectively as Aboriginal peoples, which includes First Nations (Indians), Inuit, and Métis. In this paper we will use the collective term Indigenous peoples or Aboriginal peoples interchangeably to refer to these groups in Canada. The Indigenous peoples of the US are referred to as Native Americans or American Indians, and Alaska Natives.

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