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The associations of dispositional mindfulness, self-compassion, and reappraisal with symptoms of depression and anxiety among a sample of Indigenous students in Canada

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ABSTRACT

Objectives: Depression and anxiety are major concerns among students. Unfortunately, there are disparities between the mental health of majority culture students (White; Judeo-Christian) and that of Indigenous students. Although mindfulness, self-compassion, and reappraisal are correlated with symptoms of psychopathology among White students, these relationships have never been examined among Indigenous students. **Participants:** Undergraduate Indigenous students recruited from a Canadian institution. **Methods:** We administered self-report measures of depression, anxiety, dispositional mindfulness, self-compassion, and emotion regulation strategies (cognitive reappraisal and emotional suppression). **Results:** 37.5% ($n=33$) and 40.9% ($n=36$) reported significant symptoms of depression or anxiety, respectively. Dispositional mindfulness and self-compassion were negatively and strongly associated with depression symptoms ($r=-.58$ and $r=-.58$, respectively). Further, both constructs were also negatively and strongly associated with anxiety symptoms ($r=-.55$ and $r=-.53$, respectively). We also found a negative correlation between reappraisal and depression and anxiety symptoms. **Conclusions:** Mindfulness, self-compassion, and reappraisal are associated with depression and anxiety symptoms among this sample of Indigenous students.

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Introduction

Depression and anxiety are the most commonly diagnosed mental health conditions in the general population.¹ Depression and anxiety typically develop during adolescence or early adulthood,² and therefore, they are significant concerns among university students. High levels of anxiety and depressive symptoms were found among approximately 33% of first-year undergraduate students enrolled in an introductory course in psychology at a Canadian university.³ In their meta-analysis of 220,000 students from 43 countries, Rotenstein et al⁴ found that the prevalence of depression or elevated depressive symptoms was 27.2%. Accordingly, rates of depression and anxiety among university students are staggeringly high in all regions of the world.

Several researchers have found that Indigenous students experience a compounding effect of multiple stressors. In addition to experiencing stressors common to most students, Indigenous students are also more likely to experience discrimination, prejudice, and acculturative stress.⁵⁻⁹ There is evidence to suggest Indigenous students are more likely to report heightened symptoms of anxiety and depression, leading to reduced academic performance and psychological well-being.^{10,11} In Canada, the term Indigenous refers to Metis, First Nations, or Inuit peoples. Evidence suggests that Canadian Indigenous students are underrepresented in

post-secondary institutions¹² and lag behind their non-Indigenous counterparts.¹³ Indigenous students are “consistently faced with barriers, including interpersonal discrimination, frustration with the university system and feelings of isolation.”^{14(p. 1262)} The educational disparities of Indigenous students can be attributed to Residential schooling and assimilative approaches adopted through colonialism.¹⁵

Throughout history, Indigenous people have been subjected to oppression, discrimination, and racism. For example, the Government of Canada considered Indigenous cultures as inferior to White, Judeo-Christian cultures, and therefore, attempted to assimilate Indigenous children into mainstream European values via Residential Schools. Indigenous children were taken away from their families to attend these schools, where their language, culture, and spirituality were attacked and suppressed.¹⁶ Upon closure of the last Residential School in the 1990s, more than 140,000 Indigenous children had received this oppressive form of schooling.¹⁷ “In Canada today, Aboriginal people are marginalized due largely to [such] historical forces and colonization.”^{18(p. 10)} The frequency of “family violence, youth suicide, psychological distress and substance abuse, [and] poorer individual health” is higher among Aboriginal communities compared to the general population^{19(p. 5)} given such systematic discriminatory practices and cultural oppression.

Mindfulness and self-compassion are both Eastern-influenced constructs that have consistently been linked to reduced depression, anxiety, and stress.^{20,21} In Western psychology, mindfulness is defined as the capacity to pay attention to present-moment experiences with purpose, balance, and acceptance.^{22,23} Self-compassion is defined as being moved by your own suffering and having the desire to alleviate such suffering for yourself.²⁴ Mindfulness and self-compassion can both be conceptualized as dispositional and dynamic constructs. That is, there is an innate capacity to be mindful and self-compassionate; however, these dispositions can be successfully cultivated through mindfulness and self-compassion interventions.^{25,26}

Researchers have consistently found that dispositional mindfulness and self-compassion are significantly related to psychopathology. For example, MacBeth and Gumley²⁷ found a large effect size of the relationship of self-compassion and psychopathology, including anxiety and depression symptoms. Similarly, Zessin et al.²⁸ found that self-compassion was significantly and positively associated with psychological well-being across several studies. Dispositional mindfulness has also been demonstrated to correlate with psychopathology and its correlates. In a meta-analysis, Giluk²⁹ found that dispositional mindfulness was negatively correlated with negative affect and neuroticism. Further, Rasmussen and Pidgeon²¹ found that dispositional mindfulness was negatively and positively related to social anxiety and self-esteem, respectively. Accordingly, there is no shortage of cross-sectional evidence among White and majority culture samples linking dispositional levels of mindfulness and self-compassion to psychopathology generally, and depression and anxiety symptoms specifically.

Mindfulness and self-compassion are particularly suited for use among Indigenous populations, as the philosophical foundations of such constructs are highly consistent with Indigenous practices and spirituality.^{30,31} For example, many Indigenous traditions (e.g., drumming, dances, and sweat lodges) are “intended ... to bring one’s own awareness to the present moment.”^{30(p. 18)} Further, and akin to Buddhist principles upon which mindfulness was founded, Indigenous cultures emphasize the interdependence of self, importance of community, and holistic rather than rational approaches.^{32–34} However, mindfulness and self-compassion studies have seldom been conducted with Indigenous individuals; to our knowledge, there are only two published studies on this topic.^{30,31} Le and Gobert³⁰ found that their intervention was acceptable among Native American youth, and was efficacious in prompting improved emotion regulation, and reducing mind wandering and suicidal thoughts. Native American youth demonstrated receptivity to the intervention and recommended it to be held in their first period of school, as they found the technique helpful to start their day with. Youth in the study reported a higher post-intervention awareness of their thoughts and emotions, as well as a higher capacity to focusing attention. Further, the intervention was also found to be “effective in terms of facilitating relationships and in strengthening connections.”^{30(p. 19)} Finally, Le and Proulx³¹ found that their

Native Hawaiian participants were receptive to and accepting of a mindfulness-based intervention that incorporated their cultural concepts. Results of this trial indicated that this tailored mindfulness intervention reduced Native Hawaiians’ biomarkers of stress and lowered their perceived stress levels.

In addition to mindfulness and self-compassion, several other emotion regulation strategies are used and promoted in Western interventions of anxiety and depression, unfortunately with little scientific support for their use to alleviate symptoms of these conditions among non-White participants.³⁵ Cognitive reappraisal and emotional suppression are two widely studied emotion regulation strategies.^{36,37} Cognitive reappraisal is defined as the reinterpretation of emotionally eliciting materials or events in a way that alters the emotional response.³⁶ Suppression is defined as a person’s attempt to decrease emotional expression of a certain emotion and/or their attempt to decrease or eliminate thoughts or discussions of this said emotion.³⁸

Traditionally, and given results from studies conducted with White participants, reappraisal has been viewed as an effective or adaptive way to regulate emotions, while suppression has been viewed as ineffective or maladaptive.^{39–41} There is a large body of the literature that indicates that cultural norms differentially reinforce or punish various emotional responses within a variety of circumstances.^{42–44} For example, although Western cultures place a premium on the open expression of emotion, Asian cultures value suppression of emotion.⁴⁵ As such, the evidence suggests that culture may moderate the adaptiveness of certain emotion regulation strategies.

Current study

Researchers have demonstrated that Indigenous people experience major disparities in housing, education, and health.^{10,46} Studies conducted among Aboriginal youth in Australia show that these youths score significantly lower than their non-Aboriginal counterparts on measures of well-being and happiness.⁴⁷ Unfortunately, and despite such evidence showing increased negative mental health outcomes for Indigenous youth in Canada and elsewhere, very few studies have been conducted to examine use and effectiveness of emotion regulation strategies among this population. Mindfulness and self-compassion appear to be strongly associated with mental health among White populations; however, there are currently very few studies that have examined the mental health correlates of mindfulness and self-compassion among Indigenous people. Further, little is known about the magnitude of correlations between various emotion regulation strategies (e.g., mindfulness, self-compassion, cognitive reappraisal, and emotional suppression) and symptoms of anxiety and depression among Indigenous samples.

Accordingly, in the current study, we recruited a sample of Indigenous university students to examine (a) rates of depression and anxiety based on screening measures; (b) the associations of mindfulness and self-compassion with

depression and anxiety symptoms; and (c) the associations of widely researched emotion regulation strategies, such as reappraisal and suppression, with depression and anxiety symptoms. As the magnitude of associations between these emotion regulation strategies and depression and anxiety symptoms has never been compared in the same study among Indigenous people, the current study addresses a large gap in the literature. We predicted that depression and anxiety would be negatively associated with dispositional mindfulness and self-compassion scores. Further, we predicted a negative correlation between cognitive reappraisal and depression and anxiety symptoms. Finally, we predicted a positive correlation between emotional suppression and depression and anxiety symptoms.

Method

Participants

Participants were recruited from a support Center specific for Indigenous Students (the Aboriginal Student Center) at a medium-sized Canadian University. As students came into the Center, they were approached by a trained research assistant, introduced to the purpose of the study, and informed that the survey was intended for Indigenous students only. Accordingly, all students who participated in the study had to self-identify as Indigenous, which includes Metis, First Nations (status or non-status), or Inuit. Students who did not self-identify as Indigenous did not qualify for participation in the study. Given the Indigenous focus of the support Center where participants were recruited, the vast majority of students approached were of Indigenous status. Interested participants were directed to one of several computers available at the Center, and those providing written consent completed study questionnaires electronically. Most participants completed study tasks within a 20- to 30-minute period.

A total of 90 participants initially participated; however, two participants (2.22%) were excluded from the study due to failure to provide responses to the six main scales being utilized in the study. The final sample comprised of 88 participants ($M_{\text{age}} = 26.55$, $SD = 7.69$; *Range* 18-53; $n = 60$ females). All participants were financially compensated for their participation in this study and received 10 Canadian dollars. The University's Research Ethics Board approved this study prior to any data collection.

Prior to recruiting participants, all questionnaire items were vetted by senior staff at the above-mentioned center, for their cultural sensitivity. Finally, in the debriefing process, all participants were asked to provide their feedback regarding the study, questionnaires, and the acceptability of the research. All participants were unanimous that scale items were sensitive, and a large majority of participants indicated that this type of research is needed, and that they would participate in future studies similar to the present one.

Table 1. Summary of Demographics.

Age: <i>M (SD)</i>	26.55 (7.69)
Gender: <i>n (%)</i>	
Female	60 (69.8)
Male	26 (30.2)
Aboriginal Status	
First Nations	77 (89.5)
Métis	8 (9.3)
Other	1 (1.2)
Marital Status	
Single/ Never Married	63 (73.3)
Married	15 (17.4)
Separated/ Divorced	8 (9.3)
Year of Study	
First	27 (31.4)
Second	22 (25.6)
Third	18 (20.9)
Fourth	10 (11.6)
Fifth and Higher	7 (8.1)
Master's Program	2 (2.3)
First Language	
English	79 (91.9)
Other	7 (8.1)
PHQ-8 <i>M(SD)</i>	9.01 (5.98)
GAD-7 <i>M(SD)</i>	8.78 (5.09)
MAAS <i>M(SD)</i>	3.77 (.84)
SCS-SF <i>M(SD)</i>	36.42 (7.57)
ERQ-Reappraisal <i>M(SD)</i>	30.23 (6.87)
ERQ-Suppression <i>M(SD)</i>	15.20 (4.96)

Note. PHQ-8 = Patient Health Questionnaire – 8; GAD-7 = Generalized Anxiety Disorder Scale – 7; MAAS = Mindfulness Attention and Awareness Scale; SCS-SF = Self-Compassion Scale – Short Form; ERQ-Reappraisal = Emotion Regulation Questionnaire – Cognitive Reappraisal Subscale; ERQ-Suppression = Emotion Regulation Questionnaire – Emotional Suppression Subscale.

Measures

Demographic information

After obtaining informed consent, we collected information on age, gender, Aboriginal status, marital status, reserve status, year of study, program of study, and first language. A summary of pertinent demographics can be found in Table 1.

*Patient Health Questionnaire-8 (PHQ-8).*⁴⁸ The 8-item PHQ measures depressive symptoms according to the criteria of depression described in the Diagnostic Statistical Manual IV (DSM-IV). Participants were asked to express how frequently they had experienced symptoms of depression over the last two weeks on a scale from 0 (“Not at all”) to 3 (“Nearly every day”). Higher scores on the PHQ-8 demonstrate more severe symptoms of depression. We used a cutoff point of 10 or higher to approximate diagnoses, as this has been shown to have good sensitivity and specificity in other studies.^{48,49} In previous studies, the PHQ-8 has been found to possess sound psychometric properties.⁴⁸ In the current investigation, the PHQ-8 exhibited excellent internal reliability of .89.

*Generalized Anxiety Disorder Scale-7 (GAD-7).*⁵⁰ The 7-item GAD is a screening tool for generalized anxiety disorder. Participants were asked to rate the frequency of being bothered by symptoms of anxiety (e.g., “feeling nervous, anxious, or on edge”) over the past two weeks on a scale from 0 (“Not at all sure”) to 3 (“Nearly every day”). Higher scores are reflective of elevated levels of GAD symptoms. The GAD-7 has been found to be reliable and valid.^{50,51} We

used a 10 or higher cutoff point to approximate diagnoses, as this cutoff has demonstrated good sensitivity and specificity.⁵⁰ In the current study, the GAD-7 possessed Cronbach's alpha internal reliability of .86.

*Mindful Attention Awareness Scale (MAAS).*⁵² The 15-item MAAS measures dispositional mindfulness. Participants responded to various statements (e.g., "I rush through activities without being really attentive to them") on a scale from 1 ("Almost always") to 6 ("Almost never"). The total score was computed by calculating the mean of the 15 items. Higher mean total scores on the MAAS suggest greater levels of mindfulness. In previous studies, the MAAS has shown to possess good reliability and validity.⁵³ In the current study, the MAAS exhibited a Cronbach's alpha internal reliability of .87.

*Self-Compassion Scale – Short Form (SCS-SF).*⁵⁴ The 12-item SCS-SF measures self-compassion. The six subscales of SCS-SF, self-kindness, self-judgement, common humanity, isolation, mindfulness, and over-identification, correspond to the six components of self-compassion. The SCS-SF derived from the original version of SCS which includes 26 items.²⁴ Each item was rated on a scale from 1 ("Almost never") to 5 ("Almost always"). After the negatively worded items were reversed, scores on all the items were summed to compute the total score. It has been recommended to use the total score instead of utilizing the score of each subscale.⁵⁴ Previous studies have reported adequate psychometric properties of the SCS-SF and have shown that it has a high correlation with the long form of the scale.⁵⁴ In the current study, the SCS-SF demonstrated an adequate Cronbach's alpha of .79.

*Emotion Regulation Questionnaire (ERQ).*³⁶ The 10-item ERQ measures peoples' tendency to use two different emotion management strategies of cognitive reappraisal and expressive suppression. Various statements (e.g., "I control my emotions by not expressing them"; "I control my emotions by changing the way I think about the situation I'm in") were rated on a 7-point Likert scale varying from 1 ("Strongly disagree") to 7 ("Strongly agree"). The ERQ is an extensively-used instrument in research among clinical and general populations, and its excellent psychometric properties have been reported in previous studies.³⁶ In the current study, the Cronbach's alpha internal reliability of the cognitive reappraisal and the expressive suppression subscales was .85 and .61, respectively.

Data cleaning and analyses

Data were checked for missing values. A few items had missing values within each scale. Person-mean imputation was used to replace the missing values using the average of each respondent's completed items on a given scale. As mentioned above, two participants (2.22%) were excluded from the analyses for not responding to the scales of interest (e.g., PHQ-8, ERQ-Reappraisal, ERQ-Suppression, GAD-7, MAAS, SCS-SF). We calculated rates of depression and anxiety based on a cutoff of 10 or higher on the PHQ-8 and GAD-7. Finally, and to address hypotheses, we conducted a Pearson's product-moment correlation analysis to examine

Table 2. Associations of depression and anxiety symptoms with mindfulness, self-compassion, and emotion regulation strategies.

	1	2	3	4	5	6
1. PHQ-8	–					
2. GAD-7	.72**	–				
3. MAAS	–.58**	–.55**	–			
4. SCS-SF	–.58**	–.53**	.40**	–		
5. ERQ-Reappraisal	–.22*	–.27*	.17	.50**	–	
6. ERQ-Suppression	.13	.08	–.05	–.29**	–.04	–

Note. PHQ-8 = Patient Health Questionnaire – 8; GAD-7 = Generalized Anxiety Disorder Scale – 7; MAAS = Mindfulness Attention and Awareness Scale; SCS-SF = Self-Compassion Scale – Short Form; ERQ-Reappraisal = Emotion Regulation Questionnaire – Cognitive Reappraisal Subscale; ERQ-Suppression = Emotion Regulation Questionnaire – Emotional Suppression Subscale.

* $p < .05$.

** $p < .01$.

correlations between constructs of interest (mindfulness; self-compassion) and scores on symptom measures (depression; anxiety symptoms).

Results

Rates of depression and anxiety based on screening measures

Using a cutoff of 10 or higher on the PHQ-8 and GAD-7, 37.5% ($n = 33$) and 40.9% ($n = 36$) of respondents met the criteria for either depression or anxiety, respectively. A total of 29.5% met the criteria for both anxiety and depression. Total scores on the PHQ-8 and GAD-7 were significantly and positively correlated, $r = .72$, $p < .001$.

Correlation of mindfulness and self-compassion with depression and anxiety symptoms

Zero-order correlation analysis revealed a significant, strong, negative relationship between scores on the PHQ-8 (depression symptoms) and scores on the MAAS (dispositional mindfulness), $r = -.58$, $p < .001$. Similarly, scores on the PHQ-8 and the SCS-SF (self-compassion) were significantly, strongly, and negatively correlated, $r = -.58$, $p < .001$.

Scores on the GAD-7 were also negatively and strongly correlated with scores on the MAAS, $r = -.55$, $p < .001$, and the SCS-SF, $r = -.53$, $p < .001$.

Correlations of reappraisal and suppression with depression and anxiety symptoms

As planned, we conducted an additional zero-order correlation analysis to examine the relationships of scores on mental health screens (PHQ-8; GAD-7) with the use of cognitive reappraisal (ERQ-Reappraisal) and emotional suppression (ERQ-Suppression). The full correlation matrix is presented in Table 2. As can be observed, depression and anxiety scores were significantly and negatively correlated with the use of cognitive reappraisal, while self-compassion was positively correlated with the use of such emotion regulation strategy. Finally, self-compassion scores were negatively correlated with the use of emotional suppression.

Discussion

Depression and anxiety are extremely burdensome conditions.⁵⁵ Even when symptoms of these conditions do not reach diagnostic thresholds, they still cause significant distress and impairment.^{56,57} People of minority status experience heightened depression and anxiety symptoms compared with individuals from the general population. Indigenous people are particularly at risk given their exposure to systemic discrimination, prejudice, and experience of historical trauma due to residential institutions.¹⁰ Although mindfulness and self-compassion have been studied widely among White and majority culture people, they have seldom been examined among Indigenous people. As such, the present study addressed a major gap in the literature, as it demonstrated that dispositional forms of mindfulness and self-compassion are negatively and strongly associated with symptoms of psychopathology. This paves the way for future studies that examine the extent to which modified or adapted mindfulness and self-compassion protocols can reduce the symptoms of depression and anxiety among Indigenous samples.

Using cutoff points on screening measures, we found that a large minority (~38-41%) of the current Indigenous sample met criteria for either depression or anxiety. Although rates of depression and/or anxiety appear high in the most undergraduate student samples (with a cross-cultural average of approximately 27%),⁴ the rates obtained in the current sample are even higher. This is consistent with earlier research, which suggests that rates of anxiety and depression are higher among Indigenous samples than they are among White and majority culture samples.¹⁰

Consistent with our hypotheses, we found that both dispositional mindfulness and self-compassion were negatively and strongly associated with depression symptoms. There are several cross-sectional studies demonstrating the negative associations of dispositional mindfulness and self-compassion with depression.⁵⁸⁻⁶⁰ Also consistent with our hypotheses, we found that anxiety symptoms were negatively and strongly associated with mindfulness and self-compassion among our sample of Indigenous students. This link is also strongly supported in the extant literature.^{21,61} Further, the strength of the correlations between mindfulness, self-compassion, depression and anxiety observed with the current sample is similar to the strength of the correlations of these constructs among non-Indigenous samples. For instance, Van Dam et al⁶⁰ found that the correlation of self-compassion with psychopathology is in the moderate-large range, while the correlation of dispositional mindfulness and psychopathology was in the small-moderate range. MacBeth and Gumley²⁷ also found that self-compassion was moderately associated with symptoms of depression and anxiety.

Indigenous cultures emphasize the interdependence of self and importance of community, holistic rather than rational approaches, and lower levels of self-disclosure.³²⁻³⁴ Accordingly, the philosophical roots of mindfulness and self-compassion have several similarities with Indigenous cultures, and so may explain the degree of association

observed between dispositional mindfulness, self-compassion, and depression and anxiety symptoms.

Also consistent with our hypotheses, we found a small negative correlation between the use of cognitive reappraisal as an emotion regulation strategy and symptoms of depression and anxiety. This link between cognitive reappraisal and improved mental health outcomes has been demonstrated in various studies.^{62,63} However, the majority of such studies have been conducted with White participants. Further, and inconsistent with our last hypothesis, we found that emotional suppression was not correlated with symptoms of depression and anxiety among our Indigenous sample.

The literature on the use of emotional regulation strategies indicates that the “adaptiveness” of certain strategies depends on its cultural and environmental context.⁴²⁻⁴⁴ Although Western cultures place a premium on open expression of emotion, Asian cultures value suppression of emotion.⁴⁵ Butler et al⁶⁴ found that, for participants with Western values, suppression was associated with reduced social responsiveness and increase in negative emotion; however, this adverse social and emotional effect of suppression was not found for participants holding Asian values. There is also evidence that the effectiveness of certain strategies will vary depending on the context. Troy et al⁶⁵ found that cognitive reappraisal strategies were associated with lower depressive symptoms only when people are experiencing uncontrollable stress. Accordingly, cultural and environmental contexts dictate the usefulness of different strategies to manage emotions.

Although our results are correlational, they are suggestive. That is, mindfulness interventions have been shown to increase dispositional levels of mindfulness,⁶⁶ and our results suggest that dispositional mindfulness is associated with lower anxiety and depressive symptoms. Most, if not all mindfulness-based programs are geared almost exclusively toward people of the dominant culture, who are typically White, middle class, and holding Judeo-Christian values.⁶⁷ Ethnically, racially, and economically diverse people participating in Western-designed programs often receive poor quality care in comparison to people of the majority culture.⁶⁸ Accordingly, there is a need to validate and adapt existing mindfulness and self-compassion models and interventions for Indigenous youth. During this process, there will likely be a need to validate and adapt multiple elements of the intervention (e.g., metaphors, concepts, and goals),⁶⁹ as well as incorporate Indigenous healing practices and ways of knowing.

Mindfulness interventions function to directly reduce symptoms of depression and anxiety, but may also function to promote protective mechanisms. For example, researchers found that mindfulness increases one’s sense of meaning,⁷⁰ while compassion-interventions may promote social and community connectedness⁷¹.

Further, and in addition to developing mindfulness interventions for Indigenous people, other social programs that cultivate protective factors among this population are in order. Researchers have found that the cultivation of

Indigenous cultural identity, holistic thinking, and community connection promotes mental health and healing among Indigenous clients.^{72,73} Kirmayer et al⁷⁴ argued that Indigenous concepts and knowledge can be incorporated into Western psychological research of resilience and mental health and using such an approach may function to empower members of such communities.

The results of our study illustrated that dispositional forms of mindfulness and self-compassion are negatively and strongly associated with symptoms of anxiety and depression. Given high rates of depression and anxiety among students generally, and Indigenous students specifically, the results of our study suggest mindfulness and compassion-based interventions, both have been demonstrated to increase dispositional mindfulness and self-compassion, may be designed for this population to help manage symptoms of these conditions. Such interventions should be culturally appropriate for Indigenous population, as many have reported that their mental health needs remain unaddressed because current therapeutic interventions are reflective of Western worldviews which are incompatible with Indigenous and Native cultural values.⁷⁵ Despite the wealth of literature among WEIRD (White, Educated, Industrialized, Rich, and Developed) samples suggesting dispositional mindfulness and self-compassion are associated with decreased symptoms of psychopathology, this has never been demonstrated among Indigenous samples. The results of our study confirm the nomological network of dispositional forms of mindfulness and self-compassion and their close relationships with depression and anxiety among Indigenous populations. This offers a catalyst for developing interventions to meet the needs of this population.

This study contributes to the literature in several ways. First, this is the first study to examine the associations of dispositional mindfulness, self-compassion, and the use of emotional regulation with symptoms of depression and anxiety among Canadian Indigenous students. Although the assumption of many mindfulness and self-compassion models is that these dispositions would be associated with improved health among people of various ethnic and cultural backgrounds, there is little empirical research to substantiate this claim.⁶⁷ Further, this is the first study to compare the associations of different emotion regulation strategies with mental health symptoms among a sample of Indigenous students. This is important, as several mainstream Western psychotherapies rely on either acceptance (e.g., mindfulness) or reappraisal strategies (e.g., cognitive therapy) to ameliorate mental health issues.³⁵

Even with such strengths, the current study has a number of limitations that pave the way for future studies. First, the scales used in the study are not validated specifically with people of Indigenous descent, and therefore, it is difficult to assess the meaningfulness of some of the findings in the absence of such validation. With that said, the scales used (with the exception of the Suppression subscale of the ERQ) appear to have acceptable Cronbach alphas; however, much more rigorous validation is required. Further, the sample size was modest and was composed entirely of

undergraduate students. This limits the generalizability of our results, as university students are typically not representative of community populations.⁷⁶ In addition, it is difficult to know whether the results obtained with the current sample would generalize to other Indigenous student samples. Specifically, Indigenous populations are heterogeneous cultural groups, each with unique cultural values, metaphors, and stories.⁷⁷ Further, as this was a cross-section study, there is no way to ascertain causality or directionality between the examined constructs. Additionally, we did not assess cultural variables, such as acculturation or discrimination, which may be important moderators of the relationships between dispositional mindfulness, self-compassion, and mental health. Finally, this study used Western definitions of target constructs (i.e., depression, anxiety, mindfulness, etc.).

Future studies should employ larger and more representative samples. Further, although mindfulness, self-compassion, and the use of cognitive reappraisal were all associated with lower self-reported depression and anxiety, longitudinal studies are needed to examine the direction of such relationships. In addition, future research should validate measures for use specifically among Indigenous people. Further and given its evidently poor internal consistency with the current sample, the cross-culturally equivalence of the ERQ suppression subscale should be further explored in future studies.⁷⁸ Future studies should also examine the relationships of various cultural variables with dispositional mindfulness and self-compassion within Indigenous communities. For example, and as mentioned, Indigenous cultures often emphasize collectivist over individualist values.³²⁻³⁴ It is not yet known whether this collectivist orientation is significantly associated with mindfulness and/or self-compassion, and whether mindfulness techniques are consistent with valuing group needs over those of the individual. Finally, researchers should establish the cross-cultural equivalence of constructs, such as depression, anxiety, mindfulness, and emotion regulation among Indigenous samples and potentially incorporate indigenous knowledge in our understanding of these constructs.⁷⁹

Conclusion

Depression and anxiety are extremely prevalent among university students and appear even more prevalent among students of Indigenous descent. Despite such high rates of anxiety and depression, little research has examined correlates of such disorders among Indigenous people. Dispositional mindfulness, self-compassion, cognitive reappraisal all been demonstrated to consistently correlate negatively with depression and anxiety symptoms. In this study, we found that these emotion regulation tendencies were strongly and negatively correlated with symptoms of depression and anxiety in a sample of Indigenous students. This paves the way for future studies using longitudinal and experimental designs to examine whether increase in dispositional mindfulness, self-compassion, and the use of

reappraisal lowers common mental health symptoms among Indigenous people.

Conflict of interest disclosure

The authors declare that they have no conflict of interest. The authors confirm that the research presented in this article met the ethical guidelines, including adherence to the legal requirements, of Canada and received approval from the University of Regina's Research Ethics Board.

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