MINDFULNESS AS A POTENTIAL MODERATOR BETWEEN THE HISTORICAL TRAUMA RESPONSE AND SUBSTANCE USE AMONG AMERICAN INDIAN YOUNG ADULTS

By

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Bachelor of Science in Psychology

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Stillwater, Oklahoma

2020

Submitted to the Faculty of the Graduate College of the Oklahoma State University in partial fulfillment of the requirements for the Degree of Master of Science December 2023
MINDFULNESS AS A POTENTIAL MODERATOR BETWEEN THE HISTORICAL TRAUMA RESPONSE AND SUBSTANCE USE AMONG AMERICAN INDIAN YOUNG ADULTS

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Title of Study: MINDFULNESS AS A POTENTIAL MODERATOR BETWEEN THE HISTORICAL TRAUMA RESPONSE AND SUBSTANCE USE AMONG AMERICAN INDIAN YOUNG ADULTS

Major Field: PSYCHOLOGY

Abstract:

Background: Since colonization, American Indian/Alaska Native (AI/AN) Peoples have experienced myriad genocidal factors (i.e., infectious disease, warfare, forced dislocation and relocation) that are understood as historical trauma. Historical trauma is commonly linked to historical trauma responses, which include anxiety, hypervigilance, depression, social withdrawal, and substance use. There is a dearth of research that investigates strategies to mitigate historical trauma responses among AI/ANs. One strategy that may mitigate historical trauma responses is trait mindfulness. Trait mindfulness has demonstrated positive effects on mental health, including reductions in stress and anxiety symptoms, however, this has yet to be examined among AI/ANs. The goal of the present study was to investigate the relations between the historical trauma response, lifetime substance use, and trait mindfulness in a sample of AI/AN adults.

Method: A quantitative survey to assess individual levels of trait mindfulness, lifetime substance use, historical trauma thought frequency and associated responses was conducted among AI/AN adults. Participants ($n = 183$) were recruited from a large, Midwestern university and the surrounding community.

Results: Results indicate positive associations between the historical trauma response and lifetime substance use as well as negative associations of trait mindfulness with the historical trauma response and lifetime substance use. Trait mindfulness was not found to be a significant moderator of the relation between the historical trauma response and lifetime substance use, however, supplementary analyses revealed trait mindfulness to be a significant moderator of the relation between historical trauma thought frequency and lifetime substance use. This relation was significant at low levels of trait mindfulness but was non-significant at high levels.

Conclusions: This research provides an understanding of the relations between historical trauma, historical trauma responses, substance use, and trait mindfulness. Further, findings suggest that there are important individual characteristics that may help to protect against negative outcomes associated with substance use. These findings may provide a foundation for future clinical or community-based participatory research (CBPR) studies to better understand how mindfulness interventions may be implemented and/or culturally adapted as prevention or intervention efforts to reduce historical trauma response symptoms, particularly substance use, with AI/AN peoples.
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CHAPTER I

INTRODUCTION

**Historical Contexts**

It is imperative to first define who American Indian/Alaska Native populations are by providing historical context and describing current health inequities in Indian country. A multitude of different names have been used to describe these populations: American Indian, Alaska Native, Indigenous, Native American, Inuit, Native Peoples, Métis, and First Nations. The term American Indian/Alaska Native (AI/AN) will be used throughout, which is the term used by the National Congress of American Indians (NCAI, 2019).

There are currently 574 federally recognized tribes in the United States, which include 9.7 million individual tribal members that identify as either AI/AN alone or in combination with one or more other ethnic/racial groups (NCAI, 2021). Federal tribal recognition is a form of political status that indicates the tribe has formed treaties with the U.S. federal government at least once (Villegas et al., 2016). However, the scope of AI/AN individuals in the U.S. is not limited to federally-recognized tribes – certain tribes are recognized only by state governments, and others exist as cultural/historical entities without recognition from federal or state governments (Villegas et al., 2016). For federally recognized tribes, upon tribal enrollment, tribal citizens are required to provide proof of their ancestral blood quantum. This makes AI/ANs the only ethnic/racial group in the United States that must provide proof of their ethnic/racial background and family lineage. This concept of the Certified Degree of Indian Blood (CDIB).
formed its roots on a faulty foundation with the 1887 Dawes Act, which stated that AI/AN individuals were required to prove ½ or greater degree of Indian blood to qualify for a portion of their tribal estate (Villegas et al., 2016). When European colonizers first arrived on the North American continent with the hopes of beginning a new life, AI/AN communities had already long been established. The European colonizers engaged in practices such as forced relocation, cultural assimilation, and ethnic cleansing in efforts to control AI/AN peoples. The presence of AI/ANs created problems for the newly formed U.S. government in terms of land allocation and ownership; thus, the federal government implemented the blood quantum criterion to estimate the total number of AI/AN individuals in the U.S. (Villegas et al., 2016).

To better understand the rich cultural histories of AI/AN populations, it is crucial to utilize an ecological framework that includes historical, social, and cultural contexts. For example, prior to European colonization in the late 15th century, it is estimated that there were between 9 and 18 million AI/AN individuals living across the North American continent (Dobyns, 1966). During this time, AI/AN peoples maintained complex tribal government systems and sovereignty, successful systems for trade, and were thriving on their own (Kirmayer et al., 2011). By the late 19th century, AI/AN populations in the U.S. had dwindled to less than 200,000 people (Thornton, 1987). This horrific drop in the size of AI/AN populations can be attributed to numerous genocidal factors, including infectious disease, warfare, forced dislocation and relocation, and boarding school abuse (Thornton, 1987; Adams, 1995). Collectively, these atrocities comprise shared traumatic experiences across generations of AI/AN populations, which has been coined as “historical trauma”. Historical trauma was first used to describe the mental state of descendants of Jewish Holocaust survivors (Prince, 1985; Kellerman, 2001). The theory
of historical trauma is conceptualized as the “cumulative emotional and psychological wounding across generations, including the lifespan, which emanates from massive group trauma” (Brave Heart, 1998; 2003).

**Historical Trauma Theory**

Dr. Maria Yellow Horse Brave Heart (1998) adapted the theoretical constructs of historical trauma and the historical trauma response to describe the cataclysmic trauma and lived experiences of AI/AN populations. The theoretical framework of historical trauma conceptualizes trauma and suffering among AI/AN populations as a communal experience, which fosters support and decreases the sense of stigma for AI/AN individuals. Historical trauma is the collective soul wounding that occurs both across an individual’s life span and across generations (Duran, Duran, Yellow Horse Brave Heart, & Yellow Horse-Davis, 1998). The historical trauma response is similar to other trauma responses (e.g., posttraumatic stress) and can include anxiety, hypervigilance, guilt, depression, numbing, social withdrawal, and identification with intergenerational suffering (Erikson, 1963; Macgregor, 1970). Historical unresolved grief composes a large proportion of the historical trauma response, which can be defined as “the profound unsettled bereavement resulting from cumulative devastating losses, compounded by the prohibition and interruption of Indigenous burial practices and ceremonies” (Brave Heart, 2011, p. 283).

Historical trauma is often employed interchangeably with historical loss, post-colonial trauma, intergenerational trauma, and collective trauma (Menzies, 2019), but for the purposes of this document, the term historical trauma will be used throughout. Walters and colleagues (2011) suggested that researchers’ inability to use one term consistently (e.g., historical trauma, soul
wounding, collective trauma, intergenerational trauma), as well as the wide range of applicability to several different components at the individual level, potentially explains the limited research on historical trauma with AI/AN populations. Further, Walters and colleagues (2011) outlined the following four frameworks to describe the range of the term “historical trauma” as studied in the prior literature: 1) historical trauma as an etiological factor, 2) historical trauma as a particular type of trauma response/syndrome, 3) historical trauma as a pathway or mechanism to transfer across generations, and 4) historical trauma as a trauma-related stressor interacting with other proximal stressors. The second framework, historical trauma as a particular type of trauma response/syndrome, is the focus of the current study.

**Intergenerational Trauma**

Intergenerational trauma and historical trauma are terms used interchangeably within the literature; however, these concepts are fundamentally distinct (Gone, 2013). Intergenerational trauma is the psychological transmission of previous traumatic events experienced by a parent carrying over into the next generation, which impacts the development and well-being of their offspring (Yehuda et al., 2008). Notably, there is emergent epigenetic evidence that trauma has the capability to alter one’s genes, further supporting the theory that the effects of trauma can be transmitted intergenerationally (Jawaid, Roszkowski, & Mansuy, 2018).

Warne and Lajimodiere (2015) proposed a theoretical model for the intergenerational transmission of historical trauma, which provides possible explanations of chronic disease disparities, including drug use, alcoholism, depression, and suicide-related outcomes, among AI/AN populations (for a visual display of this theoretical model, see Figure 1). Historical trauma and chronic disease disparities exist on a continuum in the model, including various gestational,
childhood, and adulthood stressors. These various stressors may not only greatly impact an individual’s overall quality of life, but also their parenting practices, which may further contribute to the ongoing intergenerational health disparities among subsequent AI/AN generations (Warne & Lajimodiere, 2015). The current study draws upon this theoretical framework to inform aims and hypotheses.

**Substance Use**

The documented adverse effects of historical trauma are especially concerning for AI/AN young adult populations due to increased risk of using substances in this age group (i.e., ages 18 to 25 years old) in the general population, wherein rates of substance use are similar or elevated among some same-age AI/AN populations (O’Keefe, 2012). A vast amount of prior research has demonstrated that AI/ANs have higher alcohol and drug use rates compared to their same-age counterparts of other ethnic/racial backgrounds (Cunningham et al., 2016; Brave Heart, 2003; Hautala et al., 2019). Gameon and Skewes (2021) investigated the relations between historical trauma and substance use in a sample of 198 AI adults (i.e., between the ages of 18 and 65, with an average age of 37.36) who self-identified as having a substance use problem, and findings indicated that historical trauma thoughts were associated with improved substance use outcomes when historical trauma and current trauma symptoms were low and ethnic identity and awareness of discrimination was high. In other words, historical trauma thoughts may actually serve as a protective factor against negative substance use outcomes. This may be attributed to positive correlations between historical trauma thoughts and other protective factors such as cultural connectedness or involvement, which may allow for improved overall functioning (e.g.,
decreased drug and alcohol use) through increased social support and healthier coping strategies (Gameon & Skewes, 2021).

**Mindfulness**

One promising approach that may mitigate the negative effects of the historical trauma response among AI/AN young adult populations is mindfulness. Mindfulness is defined as the “awareness that emerges through paying attention on purpose, in the present moment, and nonjudgmentally to the unfolding of experience moment by moment” (Kabat-Zinn, 2003, p. 145). Mindfulness can be broken down into two distinct variants – state and trait mindfulness. State mindfulness is conceptualized as fluctuations in mindful attention within an individual that occur as a result of numerous contextual/situational factors, including their environment or intentionally using mindfulness skills. Trait mindfulness, which is the primary focus of this study, is conceptualized as a relatively stable or fixed level of mindfulness that varies from person to person (Eisenlohr, Peters, Pond, & DeWall, 2016). The Five-Facet Mindfulness Questionnaire (FFMQ) was developed by Baer and colleagues (2006) and is a commonly used questionnaire that assesses differential facets of trait mindfulness and will be used in the current study. The FFMQ assesses five facets of mindfulness, including: 1) Acting with Awareness; 2) Describing; 3) Non-Judging; 4) Observing; and 5) Non-Reacting (Baer et al., 2006).

Mindfulness has frequently demonstrated positive effects on mental health, including reductions in stress, depression, and anxiety symptoms, as well as improved psychological well-being and overall quality of life in both clinical and non-clinical populations (Carmody & Baer, 2009; Grossman et al., 2004; Hofman et al., 2010). Higher levels of mindfulness have also been linked to decreased avoidance of internal experiences and less fear, which scholars have
speculated may, in turn, reduce substance use that is motivated by the desire to suppress or avoid unpleasant emotions and cognitions (Baer et al., 2006). To the author’s knowledge, the FFMQ has yet to be implemented or examined among AI/AN populations, so the protective effects of mindfulness are unclear in these populations.

There are several similarities between mindfulness and traditional AI/AN cultural practices, which may suggest promising acceptability/feasibility for mindfulness interventions among AI/AN communities: 1) living in the present; 2) meditation; and 3) holistic experience (Napoli & Bonifas, 2013). Mindfulness practice focuses on the present moment, which involves intentionally paying attention to both one’s internal and external environments. Many AI/AN tribes endorse similar orientations (Tsai & Alanis, 2004; Johnson, 2006) due to a focus on “being” rather than “becoming” and a focus on current rather than potential future tasks or needs (Napoli 1999). Meditation is another hallmark of mindfulness practice. While there is little research on the acceptability, feasibility, and cultural relevance of meditation among AI/AN individuals, one short-term, culturally-informed, mindfulness meditation therapeutic intervention has been developed for AI adolescents – the Dream Catcher meditation (Robbins 2001). While this intervention has not been formally evaluated, the initial case studies outlined by Robbins (2001) show promising clinical outcomes. Incorporating traditional AI/AN cultural and spiritual practices into mindfulness meditations is crucial to aid in the acceptability, feasibility, and efficacy for these interventions among AI/AN individuals (Napoli & Bonifas, 2013). AI/AN communities tend to place an emphasis on holistic approaches to well-being, considering the mind, body, and soul. Achieving balance in the mental, physical, environmental, and spiritual aspects of life is considered to be indicative of excellent overall health and wellness (Limb &
Hodge, 2008). Through cultivating awareness of each of these aspects, mindfulness reflects the inevitable intersectionality of each of these facets, which is in line with the AI/AN worldview. Thus, mindfulness interventions may hold promise for improved mental and physical health outcomes among AI/AN populations.

**Most Relevant Past Research to Inform the Current Study**

There is a longstanding association between post-traumatic stress disorder (PTSD) and problematic substance use. This comorbidity phenomenon has been conceptualized as the PTSD-substance abuse cycle, and researchers have hypothesized that consequences resulting from substance use contribute to greater PTSD symptoms, which in turn, contribute to greater likelihood of substance abuse and exposure to risky situations, potentially worsening both PTSD and substance use outcomes (McCauley et al., 2012; Read et al., 2014; Bowen et al., 2017).

Bowen and colleagues (2017) investigated the role of trait mindfulness as a coping mechanism in the PTSD-substance abuse cycle among a predominantly non-Hispanic White sub-sample within a clinical trial investigating the efficacy of a mindfulness-based prevention method for Substance Use Disorder (Bowen et al., 2014; 2017). The results indicated that mindfulness significantly mediated the relation between PTSD symptoms and substance dependence severity, such that greater levels of PTSD symptom severity were associated with lower levels of mindfulness and more severe substance dependence (Bowen et al., 2017). Future research should replicate this study with minoritized populations who use substances to cope with historical trauma to examine whether findings generalize to other populations.

Fortuna and colleagues (2017) conducted a treatment development study with adolescents between the ages of 14 and 20 years old with co-occurring Substance Use Disorder and Post-
Traumatic Stress Disorder (PTSD) by utilizing Mindfulness-Based Cognitive Therapy for Adolescent PTSD and Substance Use Disorders (MBCT-Dual) to create a manualized treatment. The researchers assessed participants’ PTSD and depression symptom severity, as well as substance use frequency, over 12 weeks of treatment. The most frequently previously used substances reported in this study were alcohol and cannabis. By the end of the 12 weeks, significant improvements were observed in PTSD and depression symptoms, as well as a reduction in cannabis use. These findings suggest clinical effectiveness and feasibility of an integrated evidence-based manualized treatment to address multiple concerns (i.e., PTSD, depression, and substance use) with adolescents (Fortuna, Porche, & Padilla, 2017). Unfortunately, the specific ethnic/racial demographic characteristics of participants were not reported in this study, so it is unclear how these results would translate to AI/AN populations.

Brave Heart and colleagues (2020) investigated the impacts of the culturally informed Historical Trauma and Unresolved Grief Intervention (HTUG) combined with Group Interpersonal Psychotherapy (IPT) on depression symptoms and treatment engagement among American Indian (AI) adults with current depression symptoms. After randomizing the participants into one of two treatment conditions (IPT-only group and HTUG + IPT group) for 2-hour therapy sessions for 12 weeks. At the conclusion of this pilot study, results demonstrated reductions in depression symptoms for both treatment groups; however, greater treatment engagement and bonding between participants was demonstrated for the HTUG + IPT group. Further, both AI and White clinical service providers displayed a preference for the HTUG + IPT intervention (Brave Heart et al., 2020). Important components of HTUG that distinguish it from other depression/grief/trauma interventions include: 1) an emphasis on traditional tribal values
and practices; 2) a validation of trauma, including historical and intergenerational collective trauma; and 3) a focus on treating individual trauma responses in the context of collective and culturally specific grief (Brave Heart et al., 2020). Findings from this pilot study suggests initial evidence for the implementation of this culturally informed treatment framework for AI populations with symptoms of depression, trauma and historical trauma, and grief responses.

Current Study: Aims and Hypotheses

The goal of the present study was to investigate the relations between the historical trauma response, lifetime substance use, and trait mindfulness in a sample of AI/AN young adults. To the author’s knowledge, no study has examined trait mindfulness as a potential moderator of the relation between the historical trauma response and substance use in AI/AN young adult college students. The primary aims of the current study are to examine: 1) the associations between the historical trauma response, substance use, and trait mindfulness in a sample of AI/AN young adults, 2) trait mindfulness as a potential moderator of the relation between the historical trauma response and substance use among AI/AN young adults, and 3) the five subscales of trait mindfulness as potential moderators of the associations between the historical trauma response and substance use to elucidate which mindfulness facets may be driving these relations, if present. For Aim 1, it is hypothesized that the historical trauma response and lifetime substance use will be positively associated with each other, and that both the historical trauma response and lifetime substance use will be negatively associated with trait mindfulness, in a sample of AI/AN adults, which will be investigated using Pearson bivariate correlation analyses. For Aim 2, it is hypothesized that trait mindfulness will significantly moderate the relation between the historical trauma response and lifetime substance use, such that
higher levels of trait mindfulness will result in lower levels of lifetime substance use among AI/AN adults, which will be investigated using linear multiple regression analyses. Further, it is hypothesized that this moderation will be detected irrespective of the historical trauma response levels. For Aim 3, given that no prior study has examined the subscales of trait mindfulness as potential buffers on the relation between the historical trauma response and substance use among AI/AN adults, this aim is exploratory, and no specific hypotheses are proffered.
CHAPTER II

METHOD

Participants

Participants were recruited from Oklahoma State University’s (OSU) Sona system and the Stillwater community via chain-referral sampling. To recruit from the community, emails were sent to local listservs, including the Oklahoma Society of Indigenous Psychologists. Flyers were placed in several on- and off-campus locations, including the Center for Sovereign Nations and the American Indians into Psychology student office. Participants were encouraged to share the study with others who may also be eligible. To be eligible for the study, participants met the following inclusion criteria: 1) self-identified as AI/AN, 2) have used substance(s) at least one time in their lifetime as measured by the Drug Use Disorders Identification Test (DUDIT) and the Alcohol Use Disorders Identification Test (AUDIT), and 3) be at least 18 years of age. For the current study, each of the 18 National Institute on Drug Abuse (NIDA) substance categories were assessed (NIDA, 2021). To detect a moderation effect with 95% power (alpha = .05; two-tailed), G*Power suggested a total of 197 participants to reliably examine this relation. Due to attrition, some participants may not complete the survey in its entirety (Pennefather et al., 1999; Touloumi et al., 2002). Thus, the present study aimed to recruit an additional 40 participants (for a total of 237 participants) to account for potential attrition rates.
**Procedures**

OSU Institutional Review Board (IRB) approval was obtained prior to data collection. Participants completed an online informed consent prior to participating in the study. After completing consent procedures, participants were asked to complete an online, anonymous survey via Qualtrics. Survey measures assessed demographic characteristics, current and lifetime substance use, frequency of historical loss thinking and associated symptoms, and trait mindfulness. As compensation for participants’ time and effort, they received 1 SONA credit if they are currently enrolled as a college student at Oklahoma State University (OSU), which is the equivalent of approximately 1 hour of research participation. All non-Sona participants were entered into a drawing to receive one of four $25 electronic Amazon gift cards sent to the email address they provided at the end of the survey. Email addresses were collected via Qualtrics at the completion of the survey, and this question was a separate question unlinked to all other participants’ survey responses.

**Materials**

**Demographics Questionnaire.** The following demographic information was assessed: age, sex assigned at birth, gender identity, race/ethnicity, education level, self-reported tribal affiliation, sexual orientation, romantic relationship status, roommate(s), geographic setting in which they have resided for most of their life, and family history of substance use.

**Five Facet Mindfulness Questionnaire (FFMQ).** The FFMQ (Baer et al., 2006) is a 39-item self-report questionnaire based on five previously constructed mindfulness questionnaires. Responses are rated on a 5-point Likert scale, ranging from 1 (*never or rarely true*) to 5 (*very*
The FFMQ proposes that the following five facets comprise trait mindfulness: Acting with Awareness, Describing, Non-Judging, Observing, and Non-Reacting (Baer et al., 2006). The Acting with Awareness subscale includes 8 items that assess how an individual responds to stimuli in the present moment and incorporates mindful decision-making. The Describing subscale includes 8 items that assess how an individual labels their experiences and communicates them to themselves and to others. The Non-Judging subscale includes 8 items that assess an individual’s capacity to take a neutral stance when assessing thoughts and feelings. The Observing subscale includes 8 items that assess an individual’s ability to notice internal and external stimuli, including thoughts, emotions, smells, and sounds. The Non-Reacting subscale includes 7 items that assess an individual’s ability to observe thoughts and feelings without responding or becoming attached to these experiences.

To the author’s knowledge, the FFMQ has not previously been examined among AI/AN populations. However, Watson-Singleton and colleagues (2018) demonstrated that the FFMQ had psychometric soundness, acceptability, and cultural relevance in an African American sample and demonstrated acceptable to good internal consistency for three of the five subscales of mindfulness (e.g., Acting with Awareness, $\alpha = .87$; Describing, $\alpha = .82$; Observing, $\alpha = .71$). The other two facets, Non-Judging ($\alpha = .69$) and Non-Reacting ($\alpha = .60$), demonstrated poor internal consistency (Watson-Singleton et al., 2018). In the current sample, the FFMQ total score demonstrated good reliability ($\alpha = .88$), with each of the 5 facet subscales demonstrating between acceptable to excellent reliability. Specifically, the Acting with Awareness subscale demonstrated excellent reliability ($\alpha = .90$). The Describing subscale demonstrated good reliability ($\alpha = .87$). The Non-Judging subscale demonstrated excellent reliability ($\alpha = .90$). The Observing subscale
demonstrated good reliability ($\alpha = .81$). The Non-Reacting subscale demonstrated acceptable reliability ($\alpha = .77$).

**The Historical Loss Scale (HLS).** The HLS (Whitbeck et al., 2004) is a 12-item self-report questionnaire that assesses the frequency of thinking about perceived cultural/historical losses (e.g., loss of our land, loss of our language, loss of our people) among American Indian individuals. Responses are rated on a 6-point Likert Scale, ranging from 1 (*several times a day*) to 6 (*never*). This scale was developed directly with tribal Elders via focus groups to identify different types of losses (Whitbeck et al., 2004). To the author’s knowledge, no formal psychometric analyses have been conducted with this measure; however, a study by Anastario and colleagues (2013) with a reservation sample of adult American Indian men demonstrated excellent reliability ($\alpha = .91$). In the current study, the HLS demonstrated excellent reliability ($\alpha = .96$).

**The Historical Loss Associated Symptoms Scale (HLASS).** The HLASS (Whitbeck et al., 2004) is a 12-item self-report questionnaire that is typically administered immediately following the Historical Loss Scale (HLS) to assess emotional responses to thinking about historical loss, including anger, sadness, loss of concentration, and avoidance of stimuli that reminds the individual of the losses endured. Responses are rated on a 5-point Likert scale, ranging from 1 (*never*) to 5 (*always*). This scale was developed through focus groups with tribal Elders to identify the extent to which participants directly associated their emotional distress with historical losses. To the author’s knowledge, no formal psychometric analyses have been conducted with this measure; however, a study by Anastario and colleagues (2013) that investigated risky sexual behavior and symptoms of historical losses using the HLASS among AI
men found that the HLASS demonstrated good reliability ($\alpha = .88$). In the current study, the HLASS demonstrated excellent reliability ($\alpha = .91$).

**Alcohol Use Disorders Identification (AUDIT).** The AUDIT was developed by the World Health Organization (Saunders et al., 1993) to screen for excessive drinking and to identify harmful patterns of alcohol consumption. The AUDIT can be administered either as a self-report questionnaire or as an oral interview. This study administered the 10-item self-report AUDIT questionnaire. Responses are rated on a 5-point Likert scale, ranging from 1 (*never*) to 5 (*daily or almost daily*). The AUDIT has previously demonstrated excellent psychometric properties when examined among patients in an Indian psychiatric hospital ($\alpha = .94$; Carey, Carey, & Chandra, 2003) and among a sample of AI college students ($\alpha = .92$; Cole et al., 2019). In the current study, the AUDIT demonstrated good reliability ($\alpha = .86$).

**Drug Use Disorders Identification Test (DUDIT).** The DUDIT (Bergman et al., 2003) is an 11-item self-report questionnaire that assesses all non-medical use of drugs, including cannabis, amphetamines, cocaine and other stimulants, heroin and other opioids, hallucinogens, solvents and inhalants, gamma-hydroxybutyrate (GHB), anabolic steroids, and misuse of prescription pain relievers and sedatives. Responses on the first 9 items are rated on a 5-point Likert scale, ranging from 1 (*never*) to 5 (*four times a week or more often; daily or almost every day*). Responses on the last 2 items are scored on a 3-point Likert scale, ranging from 1 (*no*) to 3 (*yes, over the past year*). The total DUDIT score ranges from 0 to 44, and it is suggested that scores of 25 or greater indicate a heavy dependence on drugs. Previous psychometric evaluation studies have demonstrated good to excellent internal consistency across several global populations ($\alpha = \geq .8$; Hildebrand 2015; Evren et al., 2014; Pape, Lobmaier, & Bukten, 2022;
Voluse et al., 2012). Of the psychometric studies conducted on the DUDIT in the United States (Hildebrand, 2015; Pape, Lobmaier, & Bukten, 2022; Voluse et al., 2012), specific ethnic/racial participant demographics were not reported; therefore, psychometric properties of the DUDIT among AI/AN populations are unknown. In the current study, the DUDIT demonstrated good reliability ($\alpha = .87$).

**Any Substance Use (AUDIT + DUDIT).** In the current study, a combined variable of the AUDIT and the DUDIT was created to code for any lifetime substance use from the following categories: alcohol (AUDIT; Saunders et al., 1993); cannabis, cocaine and other stimulants; heroin and other opioids; hallucinogens; solvents and inhalants; gamma-hydroxybutyrate (GHB), anabolic steroids, and misuse of prescription pain relievers and sedatives (DUDIT; Bergman et al., 2003). Participants who indicated any use of the above substance categories (yes) were categorized as having lifetime substance use while those who indicate no previous use (no) were categorized as lifetime substance abstainers. One prior study by Gajecki and colleagues (2014) combined the two measures to assess overall percentages of problematic substance use in a sample of patients engaged in an internet-based cognitive behavioral therapy program. To the author’s knowledge, no previous study has examined these combined measures among a sample of AI/AN adults. In the current study, the combined AUDIT + DUDIT demonstrated good reliability ($\alpha = .88$).

**Data Analytic Procedures**

All analyses were conducted in SPSS 29.0 (IBM Corp., 2022) and PROCESS 4.2 (Hayes, 2022). To test Aim 1, which hypothesized significantly positive relations between the historical trauma response (HLASS) and lifetime substance use (DUDIT + AUDIT), and significantly
negative relations of each study variable with mindfulness (FFMQ), Pearson bivariate correlation analyses were conducted. To test Aim 2, the hypothesized moderation effect of trait mindfulness on the relation between HLASS and lifetime substance use, a moderation analysis in PROCESS was conducted. To test the exploratory Aim 3, five separate moderation analyses were conducted to independently examine each of the 5 subscales of the FFMQ as potential moderators of the relation between HLASS and lifetime substance use. If Aim 2 produces non-significant results, then Aim 3 will not be explored.

**Supplementary Analytic Procedures**

Additional Pearson bivariate correlations were conducted to determine whether the frequency of historical trauma thinking (HLS), historical trauma response (HLASS), lifetime alcohol use (AUDIT), lifetime drug use (DUDIT), lifetime substance use (DUDIT + AUDIT), and the five FFMQ subscales, as well as the total FFMQ, would be significantly associated with one another. Additionally, a moderation analysis with 5000 bootstrapped re-samples and 95% Confidence Intervals was conducted using PROCESS 4.2 (Hayes, 2022) was conducted to examine whether the effects of trait mindfulness buffered the relation between HLS, instead of HLASS, and lifetime substance use. Five additional moderation analyses were conducted to independently examine each of the 5 subscales of the FFMQ as potential moderators of the relation between HLS and lifetime substance use.
CHAPTER III

RESULTS

Participants and Compensation

The proposed sample size was 237 participants. A total of 1015 participants initiated the survey; however, given that the survey was distributed online, it is possible that some of these initial responses were fraudulent. Participants who did not complete the survey in its entirety or did not meet study inclusion criteria were removed (n = 830). Three participants were removed for invalid responses using the Elemental Psychopathy Inventory (Lynam et al., 2011) and validation questions (i.e., “Is there any reason we should not use your data?” and “Please provide the reason why we should not use your data.”). This resulted in a total sample size of 183 participants with complete responses for the current analyses. For compensation of Sona participants, 128 Sona credits were granted (69.95% of the total sample). For compensation of non-Sona participants (30.05% of the total sample), one participant email was randomly selected following approximately every 60 participants (i.e., approximately one-fourth of the proposed sample size; for total of 4 Amazon electronic gift cards valued at $25 each) who had fully completed the survey (i.e., reached the end of the first survey and were sent to the second, unlinked survey to provide their email address). After receiving their $25 Amazon electronic gift card via email, participants were asked to confirm receipt. After receiving confirmation, their email was removed from the drawing pool.
Participant demographics are summarized in Table 1. Participants’ ages ranged from 18 to 66, with an average age of 24.6 years (SD = 9.47). Participants included 129 (70.5%) females and 54 (29.2%) males who identified as AI/AN alone or in combination with one or more racial/ethnic identities. The ethnic composition of this sample included 183 (100%) AI/AN individuals. When allowing for multi-racial/ethnic identification, 75 (40.5%) of participants also identified as non-Hispanic White; 7 (3.8%) of whom also identified as Black or African American; 7 (3.8%) of whom also identified as Hispanic or Latino, including Mexican Americans, Central Americans, and others; and 1 (.5%) of whom also identified as Asian or Asian American. Regarding gender identity, 165 (90.2%) participants identified as cisgender, 6 (3.3%) individuals identified as Two-Spirit, 4 (2.2%) individuals identified as nonbinary, 4 (2.2%) individuals identified as an ‘other’ gender identity (2.2%), 1 (.5%) individual identified as agender, 1 (.5%) individual identified as genderfluid, 1 (.5%) individual identified as gender nonconforming (.5%), and 1 (.5%) individual chose not to disclose their gender identity. The sexual orientation breakdown indicated 129 (70.5%) individuals who identified as heterosexual or straight, 31 (16.9%) individuals who identified as bisexual, 8 (4.4%) individuals who identified as pansexual, 5 (2.7%) individuals who identified as questioning, 4 (2.2%) individuals who identified as gay or lesbian, 4 (2.2%) individuals who identified as queer, and 2 (1.1%) individuals who identified as asexual. The romantic relationship status breakdown included 119 (65%) individuals who identified as never married (e.g., single), 28 (15.3%) married individuals, 23 (12.6%) individuals cohabitating with partners, 8 (4.4%) individuals who identified as “other” romantic partner status, 3 (1.6%) separated individuals, 1 (.5%) divorced individual, and 1 (.5%) widowed individual. Participants’ highest level of educational attainment indicated that 91 (49.7%) individuals completed some college but had not been awarded a degree, 32 (17.5%)
individuals had an associate’s degree, 27 (14.8%) individuals had a high school diploma or GED, 16 (8.7%) individuals had a Bachelor’s degree, 11 (6%) individuals had a Master’s degree, 4 (2.2%) individuals had a doctoral degree, 1 (.5%) individual had a professional degree, and 1 (.5%) individual did not complete high school. The residential geographic settings that participants resided in for most of their lives indicated that 66 (35.7%) participants spent most of their lives in a smaller city, 49 (26.8%) participants spent most of their lives in a rural or unincorporated area, 43 (23.5%) participants spent most of their lives in a suburb near a larger city, 17 (9.3%) participants spent most of their lives in a large city, 6 (3.3%) participants spent most of their lives on a reservation, and 3 (1.6%) participants selected “other” geographic settings. The median number of people living in individuals’ primary residences was 3-4 people. The median annual household income was between $40,000 and $50,000. Regarding family history of problematic substance use, 141 participants (77%) indicated a family history of problematic substance use, 40 participants (21.9%) indicated they did not have a family history of problematic substance use, and 2 participants (1.1%) chose not to respond.

**Statistical Analyses**

Pearson bivariate correlations were conducted to examine Aim 1 to determine whether lifetime substance use (DUDIT + AUDIT) and the historical trauma response (HLASS) were positively associated with each other, and whether both variables would be negatively associated with trait mindfulness (FFMQ). As predicted, the historical trauma response was significantly positively associated with lifetime substance use ($r = .33, p < .001$) and significantly negatively associated with trait mindfulness ($r = -.28, p < .001$). As predicted, lifetime substance use was also significantly negatively associated with trait mindfulness ($r = -.36, p < .001$; see Table 2).
A moderation analysis was conducted to examine Aim 2 (i.e., whether mindfulness significantly moderated the relation between the historical trauma response and lifetime substance use). Results of the moderation analysis indicated that the overall model was significant, $F(3, 179) = 14.15, p = .000$, and explained 19.2% of the variance in predicting lifetime substance use. The main effect of the historical trauma response positively predicted substance use ($\beta = .29, t[182] = 3.49, p < .001$), and the main effect of trait mindfulness negatively predicted substance use ($\beta = -.20, t[182] = -4.20, p = .000$). However, results indicated there was not a significant interaction between the historical trauma response and mindfulness in predicting lifetime substance use ($\beta = -.007, t[182] = -1.52, p = .131$). Because this interaction was non-significant, simple slopes analyses were not computed.

Aim 2 did not yield significant results, and Aim 3 (i.e., exploratory aim of examining the subscales of trait mindfulness as potential buffers on the relation between the HLASS and lifetime substance use) was dependent on the significance of Aim 2 results. Regardless, five moderation analyses were conducted to independently examine each of the 5 FFMQ subscales as potential moderators of the relation between the historical trauma response (HLASS) and lifetime substance use. For the FFMQ Observing subscale, results of the regression indicated that the overall model was significant, $F(3, 179) = 8.10, p < .001$, and explained 12% of the variance in predicting lifetime substance use. The historical trauma response positively predicted substance use ($\beta = .42, t[182] = 4.68, p = .000$), and the FFMQ Observing subscale negatively predicted substance use ($\beta = -.15, t[182] = -.98, p = .327$). Results indicated that there was not a significant interaction between the historical trauma response and the FFMQ Observing subscale in predicting substance use ($\beta = -.02, t[182] = -1.39, p = .165$). Because this interaction was non-
significant, simple slopes were not computed. For the FFMQ Describing subscale, results of the regression indicated that the overall model was significant $F(3, 179) = 10.80, p < .001$ and explained 15.3% of the variance in predicting lifetime substance use. The historical trauma response positively predicted substance use ($\beta = .36, t[182] = 4.38, p = .000$), and the FFMQ Describing subscale negatively predicted substance use ($\beta = -.43, t[182] = -3.16, p = .002$). Results indicated that there was not a significant interaction between the historical trauma response and the FFMQ Describing subscale in predicting lifetime substance use ($\beta = .0001, t[182] = .007, p = .994$). Because this interaction was non-significant, simple slopes were not computed. For the FFMQ Acting with Awareness subscale, results of the regression indicated that the overall model was significant $F(3, 179) = 11.25, p = .000$ and explained 15.9% of the variance in predicting lifetime substance use. The historical trauma response positively predicted substance use ($\beta = .25, t[182] = 2.77, p = .006$), and the FFMQ Acting with Awareness subscale negatively predicted substance use ($\beta = -.45, t[182] = -3.33, p = .001$). Results indicated that there was not a significant interaction between the historical trauma response and the FFMQ Acting with Awareness subscale in predicting lifetime substance use ($\beta = -.006, t[182] = -.51, p = .609$). Because this interaction was non-significant, simple slopes were not computed. For the FFMQ Non-Judging subscale, results of the regression indicated that the overall model was significant $F(3, 179) = 9.804, p < .001$ and explained 14.1% of the variance in predicting lifetime substance use. The historical trauma response positively predicted substance use ($\beta = .28, t[182] = 3.08, p = .002$), and the FFMQ Non-Judging subscale negatively predicted substance use ($\beta = -.35, t[182] = -2.68, p = .008$). Results indicated that there was not a significant interaction between the historical trauma response and the FFMQ Non-Judging subscale in predicting lifetime substance use ($\beta = -.008, t[182] = -.602, p = .548$). Because this interaction was non-significant, simple
slopes were not computed. For the FFMQ Non-Reacting subscale, results of the regression indicated that the overall model was significant $F(3, 179) = 10.042, p < .001$ and explained 14.4% of the variance in predicting lifetime substance use. The historical trauma response positively predicted substance use ($\beta = .37, t[182] = 4.43, p = .000$), and the FFMQ Non-Reacting subscale negatively predicted substance use ($\beta = -.43, t[182] = -2.28, p = .024$). Results indicated that there was not a significant interaction between the historical trauma response and the FFMQ Non-Reacting subscale in predicting lifetime substance use ($\beta = -.04, t[182] = -2.18, p = .031$). Because this interaction was non-significant, simple slopes were not computed.

**Supplementary Analyses**

Additional Pearson bivariate correlations were conducted to determine whether the frequency of historical trauma thinking (HLS), historical trauma response (HLASS), lifetime alcohol use (AUDIT), lifetime drug use (DUDIT), lifetime substance use (DUDIT + AUDIT), and the five FFMQ subscales, as well as the total FFMQ, were significantly associated with one another. The frequency of historical trauma thinking (HLS) was significantly positively associated with lifetime drug use ($r = .27, p < .001$), with the historical trauma response ($r = .63, p < .001$), with lifetime substance use ($r = .21, p = .006$), and with the FFMQ Observe subscale ($r = .34, p < .001$). However, the HLS was significantly negatively associated with the FFMQ Act with Awareness subscale ($r = -.24, p = .002$) and with the FFMQ Nonjudgement subscale ($r = -.31, p < .001$). The HLS was not significantly associated with alcohol use ($r = .07, p = .4$; see Table 3).

Aim 3 was dependent on Aim 2, which was non-significant. Subsequently, a modified version of Aim 3 was explored given that no specific hypotheses were proffered and because
previous research has identified historical trauma thinking (HLS), rather than historical trauma response (HLASS), as a salient risk factor for substance use and mental health problems (Brockie et al., 2015; Pokhrel & Herzog, 2014; Soto et al., 2015; Tucker et al., 2016; Wiechelt et al., 2012; Whitbeck et al., 2004). A moderation analysis was used to assess the HLS (i.e., the frequency of historical loss thinking) as a potential predictor to determine if HLS may be a more robust predictor of substance use in the context of mindfulness. Results of the bootstrapped model indicated that the overall model was significant, $F(3, 158) = 12.01, p = .000$, and explained 18.6% of the variance in predicting lifetime substance use. The HLS positively predicted substance use ($\beta = .14, t[161] = 2.57, p = .011$), and mindfulness negatively predicted substance use ($\beta = -.22, t[161] = -4.70, p = .000$). Results indicated there was a significant interaction between the HLS and mindfulness in predicting substance use ($\beta = -.007, t[161] = -2.25, p = .026$). Results of the simple slopes analyses indicated that the relation between the HLS and lifetime substance use was non-significant at high levels of trait mindfulness ($\beta = .008, t[161] = .102, p = .919$). However, the relation between HLS and lifetime substance use was significant at low levels of trait mindfulness ($\beta = .27, t[161] = 3.35, p = .001$). See Figure 2 for a visual representation.

Five additional bootstrapped moderation analyses were conducted to examine the relation between HLS and lifetime substance use with the five subscales of the FFMQ (i.e., Observing; Acting with Awareness; Describing; Non-Judging; Non-Reacting) as potential moderators of this relation. For the FFMQ Observing subscale, results of the regression indicated that the overall model was significant $F(3, 158) = 4.49, p = .005$, and it explained 7.9% of the variance in predicting lifetime substance use. The HLS positively predicted substance use ($\beta = .19, t[161] = 3.17, p = .002$), and the FFMQ Observing subscale negatively predicted substance use ($\beta = -.26,
Results indicated that there was not a significant interaction between the HLS and the FFMQ Observing subscale in predicting substance use ($\beta = -.02$, $t[161] = -1.94$, $p = .054$). Because this interaction was non-significant, simple slopes were not computed. For the FFMQ Describing subscale, results of the regression indicated that the overall model was significant $F(3, 158) = 7.69$, $p < .001$, and it explained 12.7% of the variance in predicting lifetime substance use. The HLS positively predicted substance use ($\beta = .16$, $t[161] = 2.76$, $p = .007$), and the FFMQ Describing subscale negatively predicted substance use ($\beta = -.57$, $t[161] = -3.81$, $p < .001$). Results indicated that there was not a significant interaction between the HLS and the FFMQ Describing subscale in predicting substance use ($\beta = -.006$, $t[161] = -.65$, $p = .519$). Because this interaction was non-significant, simple slopes were not computed. For the FFMQ Acting with Awareness subscale, results of the regression indicated that the overall model was significant $F(3, 158) = 8.24$, $p < .001$, and it explained 13.5% of the variance in predicting lifetime substance use. The HLS positively predicted substance use ($\beta = .12$, $t[161] = 2.05$, $p = .042$), and the FFMQ Acting with Awareness subscale negatively predicted substance use ($\beta = -.45$, $t[161] = -3.25$, $p = .001$). Results indicated that there was not a significant interaction between the historical trauma response and the FFMQ Acting with Awareness subscale in predicting substance use ($\beta = -.015$, $t[161] = -1.80$, $p = .075$). Because this interaction was non-significant, simple slopes were not computed. For the FFMQ Non-Judging subscale, results of the regression indicated that the overall model was significant $F(3, 158) = 5.026$, $p = .002$, and it explained 8.7% of the variance in predicting lifetime substance use. The HLS positively predicted substance use ($\beta = .12$, $t[161] = 1.90$, $p = .059$), and the FFMQ Non-Judging subscale negatively predicted substance use ($\beta = -.35$, $t[161] = -2.62$, $p = .010$). Results indicated that there was not a significant interaction between the frequency of historical trauma thinking and the FFMQ Non-
Judging subscale in predicting substance use ($\beta = -.004, t[161] = -.507, p = .613$). Because this interaction was non-significant, simple slopes were not computed. For the FFMQ Non-Reacting subscale, results of the regression indicated that the overall model was significant $F(3, 158) = 4.65, p = .004$, and it explained 8.1% of the variance in predicting lifetime substance use. The HLS positively predicted substance use ($\beta = .17, t[161] = 2.90, p = .004$), and the FFMQ Non-Reacting subscale negatively predicted substance use ($\beta = -.49, t[161] = -2.43, p = .016$). Results indicated that there was not a significant interaction between the HLS and the FFMQ Non-Reacting subscale in predicting substance use ($\beta = -.011, t[161] = -.84, p = .400$). Because this interaction was non-significant, simple slopes were not computed.
CHAPTER IV

DISCUSSION

Summary of Results

The overall aim of the current study was to investigate the relations between the historical trauma response (HLASS), lifetime substance use (DUDIT + AUDIT), and trait mindfulness (FFMQ) in a sample of AI/AN young adults. Specifically, for Aim 1, it was hypothesized that there would be a positive association between the HLASS and lifetime substance use in a sample of AI/AN adults. Further, it was hypothesized that there would be negative associations between trait mindfulness with the HLASS and lifetime substance use. For Aim 2, it was hypothesized that trait mindfulness would significantly moderate the relation between the HLASS and lifetime substance use, such that higher levels of trait mindfulness would result in lower levels of lifetime substance use among AI/AN adults, buffering the effects of the historical trauma response. It was hypothesized this moderation would be detected irrespective of the historical trauma response levels. For the exploratory Aim 3, specific hypotheses were not proffered given that no prior studies have examined the five subscales of the FFMQ as potential buffers of the relation between the historical trauma response and lifetime substance use.

Current results indicated hypotheses were partially supported. The hypothesized positive association between the HLASS and lifetime substance use was supported, which is consistent with historical trauma theory (e.g., substance misuse can be a response to historical trauma to reduce emotional pain; Brave Heart, 2003) and prior literature suggesting positive associations
between historical trauma and substance use among AI/AN adults (Brockie, 2012; Brockie et al., 2015; Ehlers et al., 2013). Gameon and Skewes (2021) found that, when controlling for thoughts of historical trauma, the historical trauma response was associated with fewer abstinent days. The authors also concluded that those who ruminate about historical losses may experience more historical trauma response symptoms (e.g., substance use) and suggested that qualitative studies are necessary to understand how rumination impacts historical trauma thinking and associated symptoms, including how AI/AN peoples make meaning of their historical trauma thinking (Gameon & Skewes, 2021).

The hypothesized negative association of trait mindfulness with the HLASS and lifetime substance use were also supported. Although research is limited on the impacts of historical and contemporary trauma on individual levels of trait mindfulness, there is a push for increased mindfulness and acceptance-based PTSD interventions, with the rationale that trauma symptoms are perpetuated and maintained through acts of avoidance (Thompson, Arnkoff, & Glass, 2011). However, there have not been any formal outcome studies or RCTs on the long-term effects of such intervention approaches for PTSD (Orsillo & Batten, 2005; Thompson, Arnkoff, & Glass, 2011; Walser & Hayes, 2006) nor outcome research for PTSD treatment among AI/AN adults specifically. This finding is consistent with a prior meta-analysis that examined associations between trait mindfulness and substance use, which found a weak negative association between the two variables (i.e., trait mindfulness and substance use) across 39 articles (Karyadi, VanderVeen, & Cyders, 2014). Of note, samples included in this meta-analysis were predominantly comprised of non-Hispanic White, non-clinical, young adult samples (Karyadi, VanderVeen, & Cyders, 2014). Interestingly, the authors found that this relationship was more
robust for alcohol and tobacco use compared to cannabis use across studies. Additionally, they found that Acting with Awareness, Non-Judging, and Non-Reacting were the only facets of mindfulness that were significantly negatively related to substance use (Karyadi, VanderVeen, & Cyders, 2014).

The hypothesis that trait mindfulness would moderate the relation between the historical trauma response and substance use was not supported. While the overall model and main effects were significant, the interaction between the HLASS and trait mindfulness did not significantly predict lifetime substance use, indicating that trait mindfulness was not a significant moderator of the relation between the HLASS and lifetime substance use. Although no studies have examined these variables simultaneously and among a sample exclusively comprised of AI/AN adults, these findings parallel prior research by Bowen and colleagues (2017). These authors identified trait mindfulness mediated the relation between PTSD symptoms and substance dependence severity among a clinical sample of participants from a mindfulness-based relapse prevention program (18 participants (6.4% of the total sample) identified as AI/AN). Specifically, the authors found that greater levels of PTSD symptom severity were associated with lower levels of trait mindfulness and more severe substance dependence (Bowen, De Boer, & Bergman, 2017).

While there was not a significant interaction between the HLASS and trait mindfulness in predicting lifetime substance use, the HLS (i.e., frequency of historical trauma thinking) was also examined as a predictor in supplementary analyses because previous research has found significant associations between the HLS and substance use (Brockie et al., 2015; Pokhrel & Herzog 2014; Soto et al., 2015; Wiechelt et al., 2012; Whitbeck et al., 2004). Results indicated that trait mindfulness significantly moderated the relation between HLS and lifetime substance use.
use. Specifically, this relation was significant at low levels of trait mindfulness, but not at high levels of trait mindfulness. One possible explanation for these findings is that the HLS has been found to be a more reliable scale than the HLASS (Gameon & Skewes, 2021; Whitbeck et al. 2004). Therefore, the HLS may be a more robust predictor of negative outcomes, including lifetime substance use, for AI/AN adults.

There were no significant interactions between the HLASS (i.e., historical trauma response) and any of the 5 FFMQ subscales in predicting lifetime substance use. While no significant interactions were displayed between the HLASS and the 5 FFMQ subscales, supplementary analyses were conducted with the HLS (i.e., frequency of historical trauma thinking) and the 5 FFMQ subscales. The total FFMQ was found to be a significant moderator of the relation between the HLS and lifetime substance use, but these findings were not replicated with the 5 FFMQ subscales as potential moderators. This finding is consistent with a prior meta-analysis that examined the relation between the FFMQ and substance use behaviors (Karyadi, VanderVeen, & Cyders, 2014). Findings indicated that individual mindfulness facets were not detected as significant moderators; however, the relations between substance use behaviors and FFMQ subscales varied depending upon type of substance (Karyadi, VanderVeen, & Cyders, 2014).

**Study Implications**

Results of the current study suggest that the historical trauma response is positively linked to lifetime substance use for AI/AN adults. This finding is consistent with Warne and Lajimodiere’s (2015) Inter-Generational Basis for Chronic Disease Disparities among AI/AN populations framework, which posits that historical and other traumatic experiences (e.g., forced
removal, boarding school attendance, genocide, loss of cultural practices) contribute to contemporary negative health outcomes, such as with substance use. Moreover, these contemporary psychological outcomes contribute to chronic disease disparities (including substance use) among AI/AN Peoples. More broadly, the current study suggests there are important individual characteristics (e.g., trait mindfulness) that may help to protect against negative outcomes associated with substance use.

Current findings may provide a foundation for future clinical studies to better understand how mindfulness interventions may be implemented and/or culturally adapted as prevention or intervention efforts for substance use with AI/AN peoples. While mindfulness has not yet been investigated as an intervention for substance use or other negative health outcomes among AI/AN peoples, one treatment development study with African-American adults developed recommendations (i.e., African American facilitators, incorporating cultural values, using culturally-familiar terminology, providing cultural resources) for culturally-responsive mindfulness interventions to reduce stress-related disparities (Watson-Singleton, Black, & Spivey, 2019). Fortuna and colleagues (2017) conducted a treatment development study to address co-occurring Substance Use Disorder (SUD) and PTSD by utilizing mindfulness-based therapy in a sample of adolescents recruited from a community mental health clinic, and the authors did not disclose details of the racial/ethnic composition of their sample. However, findings suggested clinical effectiveness and feasibility of using an evidence-based mindfulness treatment to address co-occurring SUD and PTSD (Fortuna, Porche, & Padilla, 2017). Taken together, current and previous findings may inform the development of future culturally-centered,
mindfulness-based interventions to address co-occurring SUD and historical trauma associated symptoms for AI/AN peoples.

**Strengths**

The current study has several important strengths. This study was exclusively comprised of 183 AI/AN adults and was collected during the COVID-19 global pandemic, which negatively and disproportionately impacted AI/AN peoples (Centers for Disease Control and Prevention, 2021; Chenneville & Schwartz-Mette, 2020; Lourenco & Tasimi, 2020). To the author’s knowledge, the current study is the first to examine mindfulness as a predictor of lifetime substance use among AI/AN Peoples, which has important implications for future culturally-centered historical trauma response and/or substance use interventions. Another strength of the current study was the examination of trait mindfulness as a possible protective factor against substance use and other negative historical trauma response symptoms. Previous literature has identified challenges in studying historical trauma due to inconsistencies with measurement and terminology (e.g., soul wounding, intergenerational trauma, collective trauma; Walters et al., 2011). Many studies have adopted the HLS and HLASS, and there have been many inconsistencies in their adaptation, scoring, and interpretation, which contributes to further difficulties in studying this phenomenon (Gone et al., 2019). As such, another strength of the current study is that both the HLS and HLASS were administered to assess each of these constructs separately. Thus, this study contributed to addressing gaps in the historical trauma literature.
**Limitations**

There are several limitations of the current study, which future research can help to address. One limitation was the use of a cross-sectional study design, which limits understanding of temporal and causal relations. Future research should replicate the current study using a longitudinal design to better determine the temporal and causal nature of these variables (e.g., is there a dose-response relationship with historical trauma thinking and substance use?). Future research may also benefit from investigating the effects of state (versus trait) mindfulness and current (versus lifetime) substance use to better elucidate the relations between these variables. Further research is needed to better understand symptoms and behaviors associated with historical loss thinking for improved measurement across tribes and cultures. Specifically, both the HLASS and HLS were developed with tribes in the upper Midwest and may not generalize to all other AI/AN cultures (Whitbeck et al., 2004). Further, findings may be prone to self-selection bias, as part of the eligibility criteria was that all participants must have engaged in substance use at some point in their lifetime, and they self-selected into the study. All participants must have had access to the internet and an electronic device to complete the online survey; therefore, the current sample may be reflective of higher SES compared to other samples of AI/AN adults.

**Future Directions**

A proposed future direction for research involves conducting qualitative interviews to better elucidate motivations for substance use (i.e., substance use motives), particularly in the context of the historical trauma response (e.g., are AI/AN young adults engaging in substance to cope with thinking about historical trauma/losses?). Community-based participatory research (CBPR) is one approach that could strengthen future studies in this area, inform substance use
prevention and intervention efforts, and reduce health inequities among AI/AN communities impacted by historical trauma. Skewes and colleagues’ (2019) CBPR study developed a culturally grounded intervention for substance use disorder (SUD) with AI/AN communities. By partnering with AI/AN communities to identify their wants and needs for improved health outcomes in their communities, research can progress toward reducing health disparities and promoting positive health outcomes, such as reducing substance use and identifying alternative and healthier coping strategies. LaVeaux and Christopher (2009) authored a list of recommendations for conducting CBPR with tribal communities, which are in tandem with Israel and colleagues (1998) original CBPR principles. These recommendations may be especially beneficial for future work with tribal communities, who may have a history of research mistrust, particularly for sensitive and potentially stigmatizing topics, such as historical trauma and substance use.
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collaborative project on early detection of persons with harmful alcohol consumption-II. 
*Addiction, 88*(6), 791-804.


### Table 1. Participant Demographics, Total N = 183.

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<tr>
<td>Female</td>
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<td>AI/AN + Asian or Asian American</td>
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Table 2. Primary Correlation Matrix for Study Variables

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<th>Variable</th>
<th>SUB</th>
<th>HLASS</th>
<th>FFMQ</th>
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<tr>
<td>SUB</td>
<td>-</td>
<td>.33**</td>
<td>-.36**</td>
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<td>HLASS</td>
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<td>FFMQ</td>
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Note. SUB indicates lifetime alcohol and drug use; HLASS indicates historical trauma associated symptoms; and FFMQ indicates trait mindfulness.

**p < .01
Table 3. Supplementary Correlation Matrix.

<table>
<thead>
<tr>
<th>Variable</th>
<th>SUB</th>
<th>ALC</th>
<th>DRUG</th>
<th>HLS</th>
<th>HLASS</th>
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Note. SUB indicates lifetime alcohol and drug (substance) use; ALC indicates lifetime alcohol use; DRUG indicates lifetime drug use; HLS indicates frequency of historical trauma thoughts; HLASS indicates historical trauma associated symptoms; FFMQ indicates trait mindfulness; OBS indicates the Observe FFMQ subscale; DESC indicates the Describe FFMQ subscale; AW indicates the Act with Awareness FFMQ subscale; NJ indicates the Nonjudgement FFMQ subscale; and NR indicates the Nonreact FFMQ subscale.

Note. Sample size for HLS was slightly lower (N = 162) after removing missing responses.

** p < .01; * p < .05
Figure 1. Inter-Generational Basis for Chronic Disease Disparities Among American Indians and Alaska Native Populations (Warne & Lajimodiere, 2015)
Figure 2. Trait Mindfulness as a Moderator of the Relation Between the Historical Trauma Response and Lifetime Substance Use.
VITA

Cassidy M. Armstrong

Candidate for the Degree of

Master of Science

Thesis: MINDFULNESS AS A POTENTIAL MODERATOR BETWEEN THE HISTORICAL TRAUMA RESPONSE AND SUBSTANCE USE AMONG AMERICAN INDIAN YOUNG ADULTS

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