AN UPDATED SYSTEMATIC REVIEW OF RISK AND PROTECTIVE FACTORS RELATED TO THE RESILIENCE AND WELL-BEING OF INDIGENOUS YOUTH IN THE UNITED STATES AND CANADA

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Abstract: Indigenous youth in North America experience mental health inequities compared to White peers, including a higher prevalence of depression, anxiety, suicide, and substance use. This systematic review of culturally specific risk and protective factors related to resilience and mental health in Indigenous youth aimed to synthesize the recent evidence and update a systematic review of evidence prior to 2013 (Burnette & Figley, 2016). Following PRISMA guidelines, seven academic databases were searched for peer-reviewed qualitative and quantitative resilience research with Indigenous youth (age 19 and under) in the United States and Canada published from 2014 to 2021. Seventy-eight studies met inclusion criteria and provided ample knowledge about risk and protective factors for the resilience of Indigenous youth across the Social Ecology of Resilience theory: individual (86%), family (53%), community (60%), cultural (50%), and societal (19%). A plethora of recent interventions serve as examples of context and culture-specific responses to the mental health needs of Indigenous youth. Further attention to younger children, urban populations, and Indigenous knowledge systems is needed. In particular, the influence of racism, settler colonialism, and cultural resurgence efforts on the well-being of Indigenous youth are areas for future research.

INTRODUCTION

Indigenous youth experience more health inequities compared to White peers, including a higher prevalence of depression, anxiety, suicide, and substance use behaviors (Indian Health Service, 2017; Subica & Wu, 2018; Walker et al., 2018; Wong et al., 2014). Factors related to these disparities include historical and contemporary trauma, forced assimilation practices, family fragmentation, poverty, and loss of land, language, and culture (Goodkind et al., 2010; Lewis et al., 2018; Whitbeck, 2006). Mainstream treatments for improving physical and mental health are often

suboptimal in Indigenous populations (Goodkind et al., 2015) due to most traditional Indigenous philosophies being holistic and including an interconnected view of mind, body, spirit, and environment, instead of the Euro-American traditional medical model that aims to cure disease (Barker et al., 2017). Additionally, Indigenous communities may prefer a strength-based approach to a deficit-based approach when addressing mental health, which does not align with the Euro-American medical model (Jumper-Reeves et al., 2014). Culturally relevant practices and interventions promoting resilience are desired outcomes of research with Indigenous youth (Jongen et al., 2019; Wexler et al., 2015). A collective view of the recent advances in community-based and culturally relevant research about the resilience and mental health needs of North American Indigenous youth is needed.

Literature from 1988-2013

Burnette and Figley (2016) conducted a systematic review of risk and protective factors related to wellness of American Indian and Alaska Native (AI/AN) youth that included research from 1988 through 2013. Burnette and Figley's search resulted in 51 peer-reviewed articles, of which findings were organized into the Social Ecology of Resilience theory (Ungar, 2008, 2011a, 2011b), as shown in Figure 1. The three most important empirical domains involved relationships, which suggested that interventions aimed at strengthening the relationships with family, culture, and community resilience were essential. Burnette and Figley's review also uncovered gaps in the literature of AI/AN resilience. For example, few studies involved children younger than 10 years old, only three studies adopted a qualitative methodology, there was a paucity of resilience intervention studies, and they identified a pervasive lack of holistic and culturally relevant definitions of resilience (Burnette & Figley, 2016).

Figure 1. Risk and protective factors for AI/AN youth within the Social Ecology of Resilience theory

Societal: Historical Oppression & Perceived Discrimination

Cultural: Ethnic Identity, Spirituality, & Connectedness

Community: School, Community, Peer Influence, & Social Support

Family: Support, Income, Mental Health, & Trauma,

Individual

Note: Re-printed with permission from Burnette & Figley (2016).

Theoretical Framework of Resilience

Decades of resilience research have evolved the concept of resilience and identified relationships of resilience to health and well-being (Masten & Barnes, 2018). Ungar (2013) defined resilience as both a trait of an individual or group as well as a set of processes and mechanisms through which internal and external strengths are harnessed in response to adversity. The present systematic review continued with Ungar's theory of Social Ecology of Resilience (Ungar, 2008, 2011a, 2011b) that is based on four principles. First, one must *decentralize* the child from the focus of resilience and instead realize that availability and accessibility of culturally relevant resources affect the resilience of the child. Second, resilience is *complex* and context specific. Third, resilience is not representative across contexts and thus is *atypical*. Fourth, resilience is *culturally*, historically, and temporally *relative* and may not be congruent with dominant cultural norms. Resilience does not merely involve a return to a previous state but is a dynamic process of growth and transformation (Kirmayer et al., 2012). Resilience research must account for three important things: risk exposure, promotive processes, and desired outcomes based on the culture and context (Ungar, 2019). Concepts within the Social Ecology of Resilience theory (Ungar, 2008, 2011a, 2011b) include the domains of individual, family, community, cultural, and societal, which represent antecedents of adaptive growth. Examples of individual resilience traits are temperament or coping skills, while family resilience might include parent or caregiver attachment and economic security. Community resilience resources may be a quality day care program or safe and effective schools. Cultural resilience may be drawn from spirituality or ethnic identity, while the societal domain draws from historical oppression and discrimination (Burnette & Figley, 2016, Ungar, 2011a, 2011b). The child's mechanism of resilience includes activating their individual strengths while navigating resources and negotiating for these resources to be provided to them. Therefore, resilience is a process of resource provision (Ungar, 2011a).

The construct of resilience is pertinent to youth particularly around the stressful transition to adolescence when they must rely on patterns and strategies acquired throughout life to adapt to changing environmental conditions (Ungar, 2011b, p. 47). Resilience theory provides a positive adaptation view congruent with many overarching Indigenous traditions and beliefs among AI/AN and Canadian Aboriginal communities, who share histories of settler colonization, genocide, and intentional loss of culture (O'Neil et al., 2018). Before colonization, the Indigenous peoples of the United States and Canada lived and interacted with one another without the boundaries we know

today (Gone et al., 2019). Some researchers consider North American Indigenous communities collectively when addressing health equity, excluding those populations south of the U.S. border. The United States and Canada experienced dominant British and French influence in colonization, including such experiences such as signing treaties, having to use the English language, being forced into assimilating boarding schools, and having land decimated to a system of reservations or reserves (Whitbeck et al., 2004). Native Hawaiian youth were originally included in this review but later excluded; please refer to the methods section. For simplicity, "Indigenous" youth in this paper refers to Canada First Nations, Métis, Inuit (FNMI), American Indian (AI), and Alaska Native (AN) youth under age 19.

There are more than 630 First Nation communities in Canada (Government of Canada, 2021) and 574 federally recognized tribal nations in the United States (National Congress of American Indians, 2021), each with unique histories, languages, cultural practices, and spiritual beliefs. For example, the Métis people currently live across a wide geographical area of Canada, often in urban environments, hold values of autonomy, self-reliance, and a need to maintain their identity (Kirmayer et al., 2012). Alternatively, the Inuit people who have lived in small groups in the challenging environment of the Arctic, have developed resourcefulness, hope, and a connection to the land and environment (Kirmayer et al., 2012). Brave Heart et al. (2011) described how differences exist across Indigenous regions in North America in how psychological distress related to historical trauma are experienced and addressed. Health prevention programs and health interventions must acknowledge these cultural differences. Findings regarding Indigenous youth resilience from research with diverse study populations can be *generally* mapped using the Social Ecology of Resilience theory (Ungar, 2008, 2011a, 2011b), but when developing local and culturally relevant community programs and interventions, the findings of individual studies can offer context-specific examples. The systematic review aims to evaluate culturally specific risk and protective factors related to well-being, resilience, and mental health in Indigenous youth in literature published since 2013. Like the original review by Burnette and Figley (2016), this study was guided by the Social Ecology of Resilience theory (Ungar, 2008, 2011a, 2011b).

METHODS

The systematic review was recorded in Prospero in March 2021 and used the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Page et al., 2021). The authors also consulted guidelines regarding updating systematic reviews (Garner et al.,

2016) and corresponded by e-mail with Catherine Burnette McKinley, who granted permission to update the original systematic review. A literature search was conducted in the following academic databases: Academic Search Ultimate, CINAHL, Embase, Google Scholar, PsychINFO, PubMed, and Sociological Abstracts. The authors supplemented the search with further searching of personal libraries and reference lists in published articles. Each of the seven databases was searched using a combination of MeSH terms and keywords or subject headings and keywords, when possible. Search strategies by Burnette and Figley (2016) were enhanced to capture the relevant current literature in this review (see Table 1). Of note, the term "Indigenous" was not included as numerous attempts to refine the search including the word "Indigenous" produced unwieldy results due to the global applicability of the term. Instead, the search specifically named the Indigenous groups in Canada along with AI/AN and Native Hawaiian.

Table 1
Search strategies

Original search terms used by Burnette & Figley (2016) (Data collection until 2014):	Updated search terms
("American Indian," OR "Alaska Native," OR "Native American,") AND ("mental health," OR "substance abuse,") AND ("risk factor," OR "protective factor," OR "resilience," OR "resiliency,") AND ("youth," OR "adolescent")	("American Indian," OR "Alaska Native," OR "Native American," OR "Inuit" OR "First Nation" OR "Native Hawaiian") AND ("mental health," OR "substance*," OR "risk*" OR "vulnerability" OR "suicide*" OR "risk factors" OR "health risk behaviors) AND ("resilience*" OR "adaptation, psychological" OR "resilience, psychological" OR "coping" OR "adapt*" OR "protect*" OR "wellness" OR "wellbeing" OR "well being" OR "well-being" OR "asset-based") AND ("child*" OR "adolescent*" OR "juvenile" OR "teen*" OR "youth")

Table 2
Inclusion and exclusion criteria

Inclusion	Exclusion
American Indian, Alaska Native, Native Hawaiian, Indigenous Canadian (Inuit, First Nations, Métis)	Indigenous populations outside the U.S. or Canada. Other Pacific Islanders. Non-indigenous populations.
Age 19 and under, high schoolers up to grade 12	Adults, college populations
Focus on resilience, well-being, pro-social outcomes, risk or protective factors, mental health outcomes, substance use, suicide	Results that do not include knowledge about the stated inclusion factors (such as instrument or protocol development without results relating to the sample)
Published 2014 or later, data collection prior is acceptable	Published prior to 2014
Articles in peer-reviewed journals	Abstract only, commentary, dissertation, book, conference proceeding, literature reviews, systematic reviews

Eligibility Criteria

Inclusion and exclusion criteria are shown in Table 2. Studies involving mixed samples of Indigenous/non-Indigenous youth, locations within/outside North America, or adults/children were reviewed only if findings for the specified population were reported separately.

Study Selection

The article selection process is depicted in a PRISMA flow diagram (see Figure 2). After searching the seven databases, duplicate articles ($n = 365$) were discarded, and the remainder were screened for relevance by title and abstract by authors C.H., T.G., and R.D. Each author did a title/abstract screen for 398 of the 596 original articles so that two authors screened each article. Ties were broken by the author who did not originally screen the title/abstract. For the qualifying title/abstracts, full text articles were acquired. At this point in the project a qualified fourth author, J.A.B., joined the study due to the volume of articles obtained. Each full text article was screened by two authors and ties were broken by an author who did not originally screen the full text in question. Data from each article was extracted by one of three authors (C.H., R.D., or T.G.) using a codebook they developed, with reliability checks by the team on several randomly selected articles and as needed. The authors performed norming exercises at three points during the systematic review process. The original search was done in January 2021 resulting in 72 articles. The search was repeated in October 2021 and the procedures were repeated, resulting in an additional 8 articles which made the total 80.

The original search included Native Hawaiian youth based on one author's interpretation of recent literature that described Indigenous knowledge-based health promotion strategies that grouped American Indian, Alaska Native, and Native Hawaiian populations together (Walters et al., 2018). The authors engaged in extensive conversations about the relevance of Native Hawaiian youth to other Indigenous North American youth throughout the systematic review process. Finally, reviewers' feedback was considered and ultimately two articles focusing on Native Hawaiian youth were eliminated due to being less relevant to the context of Indigenous youth in the United States and Canada. For example, Native Hawaiians are grouped with "Other Pacific Islanders" by the United States Census Bureau (HHS.gov, 2021, October 12), which broadens the population characteristics to other cultures and histories. The October 2021 search results and the late exclusion of articles were merged into the PRISMA flowchart (Figure 2) to show the final 78 articles.

All four researchers reflected on their own backgrounds and potential bias they brought to the project. For example, the first author is White, and the other three authors are American Indian from three different tribal nations. Each resides in a different state in the Western United States. Each author viewed the data collected through a different lens and addressed this by collaborating and coming to agreement about including or excluding articles to minimize selection bias, along with the group norming exercises that were performed before each screening phase.

Figure 2. Modified PRISMA diagram
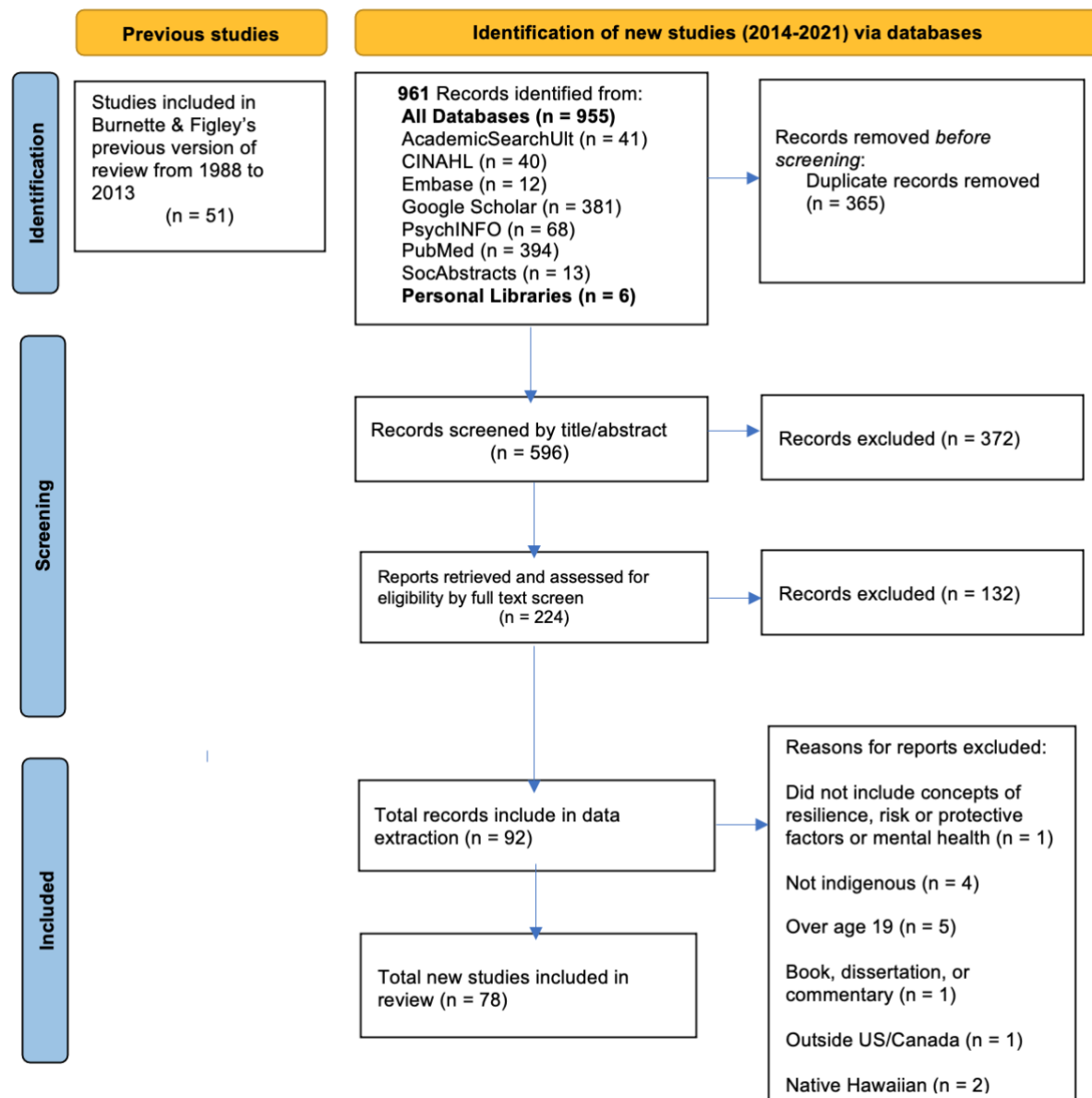
Note: From Page et al. (2021). The PRISMA 2020 statement: An updated guideline for reporting systematic reviews.

Strength of Evidence

In the protocol, every article was evaluated for bias and quality with GRADES of evidence (BMJ Best Practice, 2021) for quantitative studies and the JBI Checklist (Joanna Briggs Institute, 2020) for qualitative studies. For comparison purposes in this study, the JBI criteria of "include," "seek further," or "exclude," was equated to high, medium, or low quality, respectively. No articles were excluded based on quality alone. Of the quantitative studies or quantitative strands from mixed methods studies, GRADES were rated as very low ($n = 7$), low ($n = 32$), moderate ($n = 20$), and high ($n = 1$). Of the qualitative studies or strands, research articles ranked low ($n = 4$), moderate ($n = 15$), high ($n = 5$), and unable to evaluate ($n = 1$).

Characteristics of Studies

The most common ages of Indigenous youth in the present review were 11-19 years (see Figure 3), geographic locations were in the continental United States (see Figure 4), and in rural/reservation settings (see Figure 5). The methodology of studies is depicted in Figure 6. Thirty-two studies reported on interventions (see Figure 7).

RESULTS

Mental health outcomes measured in the final 78 studies were numerous and heterogeneous, but the most common positive outcomes were related to resilience ($n = 16$), ethnic/cultural identity ($n = 14$), well-being ($n = 10$), social support ($n = 10$), parent relationships ($n = 9$), self-esteem ($n = 5$), and cultural connectedness ($n = 5$). The most common negative mental health outcomes were related to substance use ($n = 35$), suicidal ideation or behavior ($n = 12$), depression ($n = 10$), anxiety ($n = 8$), historical trauma symptoms ($n = 6$), discrimination ($n = 5$), and bullying ($n = 2$). Factors of resilience across theoretical domains are shown in Figure 8. More details about each study can be found in Appendix Table A1.

Figure 3. Ages of youth in studies (2014-2021)
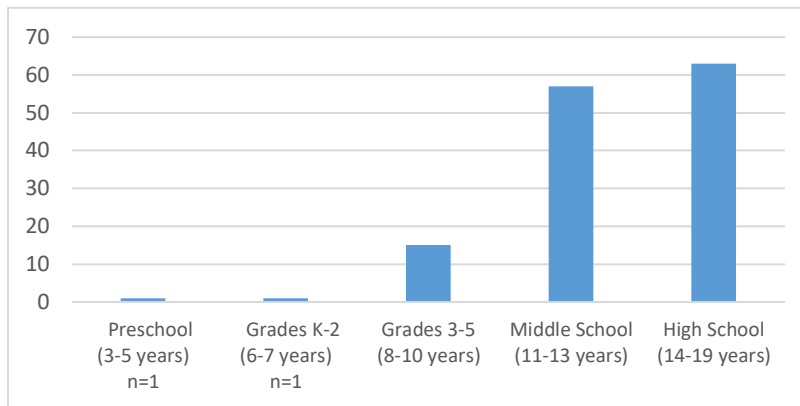
Note: Ages were not reported in earlier review other than "the majority of articles described ages 10-18."
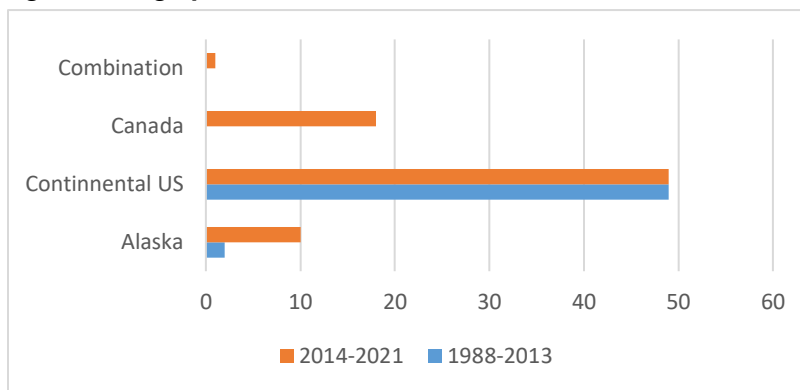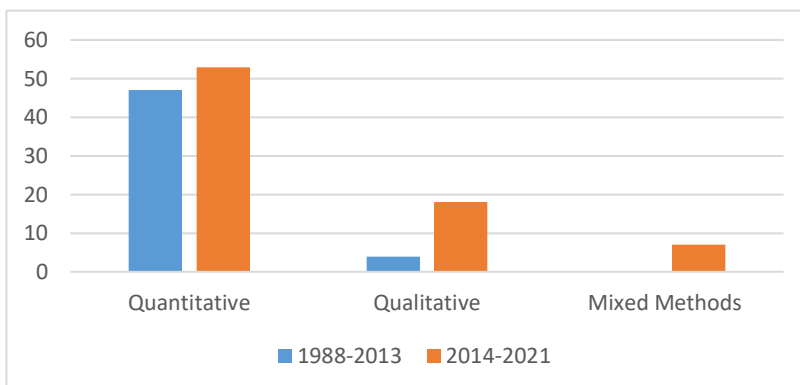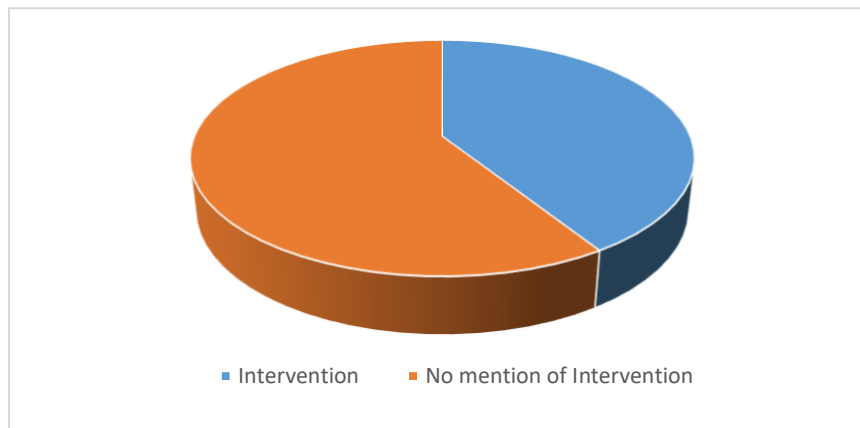
Figure 4. Geographic location of studies

Figure 5. Reservation/rural versus urban sample

Figure 6. Methodology of studies

Figure 7. Intervention studies (2014-2021)

Note: The original review did not specify the number of intervention studies but stated, "Clearly, more culturally relevant and culturally specific prevention and interventions are needed" (Burnette & Figley, 2016, p. 149).

Figure 8. Factors of resilience across domains of the Social Ecology of Resilience theory (Ungar, 2011a)
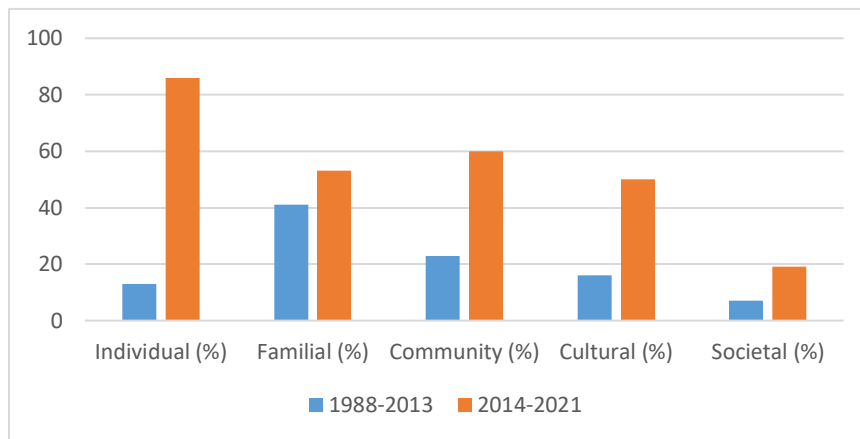
Note: Original review identified one factor per article, while the updated review identified multiple factors per article.

Individual Factors of Resilience

Individual protective factors for suicidal ideation among Indigenous youth included Reasons for Life, a multidimensional construct that draws from one's cultural and spiritual beliefs about meaning in life (Allen et al., 2019). Individual risk factors for suicidal ideation included depression and the use of substances (Cwik et al., 2015) and shame (Crooks et al., 2015). Individual protective factors for substance use included social skills that help resist peer pressure (Nuño & Herrera, 2020), self-compassion (Spillane, Schick, Goldstein, et al., 2021), life skills (Baydala et al., 2014), future orientation, self-determination, and a perception of negative consequences of substance use (Crabtree et al., 2020). Additionally, the construct of Reflective Processes, which includes the potential culturally specific negative consequences of drinking was found to be protective (Allen et al., 2014). Individual risk factors for substance use included age of first use of alcohol and illicit drugs (Nuño & Herrera, 2020), sensation-seeking, poor school performance (Morrell et al., 2018), and impulsivity (binge drinking; Cwik et al., 2017). Individual protective factors for other outcomes

included Connecting to Self for resilience and well-being (Ritchie et al., 2015), ego strengths and racial/ethnic identity for personal adjustment and well-being (Gfellner, 2016), social supports, extracurricular activities, and healthy eating and sleeping for mental distress (Ersan & Rodriguez, 2021). Individual risk factors for other outcomes included having experienced trauma, substance use, skipping school for mental distress (Ersan & Rodriguez, 2021), polysubstance use for antisocial and oppositional behaviors and being bullied (Kulis et al., 2016), and substance use and early dating for aggressive offenses (Sittner & Hautala, 2016).

Familial Factors of Resilience

Familial protective factors for suicidal ideation included interpersonal factors, social support (Bush & Qeadan, 2020), and positive relationships with adults in the home (Fullerton et al., 2019). Familial risk factors for suicidal ideation included exposure to suicide or attempts in loved ones and substance use disorders in caregivers (Cwik et al., 2015). Familial protective factors for substance use included living with both parents as protective from marijuana use (Swaim & Stanley, 2021). Familial risk factors for substance use were poor family functioning (binge drinking; Cwik et al., 2015), family's own substance use, youth's access to substances, parental favorable attitudes towards substance use (Morrell et al., 2020), family history of antisocial behaviors, and favorable attitudes towards substances (Nuño & Herrera, 2020). Familial risk factors for other outcomes included parent rejection for aggressive offenses (Sittner & Hautala, 2016).

Community Factors of Resilience

Schools were a common place for data collection among AI/AN and FNMI youth (55%), often drawing from research on existing state, regional, or national surveillance data. Some authors evaluated culturally adapted school-based curricula, such as that of 3-8 grade FNMI children (Baydala et al., 2014) or AN adolescents in a school leadership program (Wexler et al., 2017). Community protective factors for suicidal ideation included connections to adults and Elders (Philip et al. 2016). Community risk factors for suicidal ideation included bullying perpetration and victimization (Gloppen et al., 2018) and overlap with binge-drinking (Cwik et al., 2017). Community protective factors for substance use were extracurricular activities (Moilanen et al., 2014; Spillane, Schick, Nalven, et al., 2021) and peer norms against substances (Martinez et al., 2015; Nuño & Herrera, 2020). Community risk factors for substance use were peer norms and use

of substances (Nalven et al., 2020; Nuño & Herrera, 2020; Whitesell et al., 2014) and connections to adults and Elders (Philip et al., 2016). Specific to binge drinking, risks were peer pressure, fights with boyfriend/girlfriend, and a lower cultural identity (Cwik et al., 2017). Community protective factors for other outcomes included a community mentoring program for improving emotional problems and anxiety symptoms (DeWit et al., 2017), youth-driven and solution-focused programs (Rasmus et al., 2014), and community activities and stable peer relationships (Kral et al., 2014). Community risk factors for other outcomes were bullying perpetration and victimization for suicidal ideation and anxiety symptoms (Gloppen et al., 2018).

Cultural Factors of Resilience

Cultural protective factors for suicidal ideation included cultural participation (Cwik et al., 2015). There were no reported cultural risk factors for suicide. Cultural protective factors for substance use included cultural identity (Belone et al., 2017) and cultural participation (West et al., 2021). Spirituality and religiosity were mostly protective factors but had mixed effects across substances (Nuño & Herrera, 2020; Unger et al., 2020). Cultural risk factors for substance use (binge drinking) included lower cultural identity (Cwik et al., 2015). Cultural protective factors for other outcomes included cultural identity for depressive symptoms (Tyser et al., 2014). Cultural connectedness (Crooks et al., 2015; Tyser et al., 2014), culturally relevant mentoring (Crooks et al., 2017), "connecting to Creation," and "connection to God and Christianity" (Lys, 2018) were protective for well-being. Cultural knowledge was protective for anxiety symptoms and relationships with caregivers (Chambers et al., 2021). There were no reports of cultural risk factors for other outcomes.

Societal Factors of Resilience

The historical and sociopolitical experiences of Indigenous peoples since colonization contribute to the complexity of Indigenous youth well-being. Historical trauma refers to the brutal treatment and subjugation of Indigenous people, leading to social determinants that undermine health in the population (Gone et al., 2019). Societal protective factors for substance use were not identified in this review. Societal risk factors for substance use were historical trauma (Soto et al., 2015) and discrimination (Davis et al., 2019). Societal protective factors for other outcomes included a high sense of coherence (comprehensibility, manageability, and meaningfulness) and

AI/AN culture, sports, arts, music, and family for Historical Loss Associated Symptoms (Whitbeck et al., 2004), including anxiety/depression and anger/avoidance (Evans & Davis, 2018). Harm-reduction and self-determination (Cooper et al., 2019), cultural camps (Barnett et al., 2020), and parental cultural socialization (Yasui et al., 2015) were protective for resilience in the context of historical trauma. Societal risk factors for other outcomes included family conflict, loss, school stress, and isolation for Historical Loss Associated Symptoms (Evans & Davis, 2018). Discrimination was a risk factor for depression (Yasui et al., 2015).

Interventional Resilience Research

Intervention research in the present review ranged from small feasibility studies to decade-long, multilevel, longitudinal studies. Most prevention interventions addressed the outcomes of suicide and substance use. Suicide prevention interventions included a community-driven and culturally adapted brief intervention named "New Hope" in Arizona that was found to decrease negative thinking, depression, and suicidal ideation and increase use of psychological services in a sample of 13 AI adolescents (Cwik et al., 2016). The cultural adaptation of a substance use prevention program for Indigenous 3rd-8th grade children living on reserve in Canada was used in a mixed methods intervention study (Baydala et al., 2014). Qualitative data about the effects of the intervention were positive across all ages. In the intervention group of middle school children, quantitative data showed significant differences from the control group. These differences included more knowledge about the negative effects of alcohol and more knowledge/decreased behavior in terms of drug use or intent (Baydala et al., 2014). In rural southwest United States, the "Respecting the Circle of Life" program, an AI/AN substance use prevention program, measured co-occurring substance use and sexual health behaviors in an interventional trial during an 8-day summer camp (Tingey et al., 2021). The Respecting the Circle of Life intervention was statistically significant in lowering intention to use substances for southwest AI/AN adolescents, as was the "Be Under Your Own Influence" intervention for Northern Plains AI/AN 7th-graders (Crabtree et al., 2021). Equine-assisted therapy at a residential inhalant treatment center for FN adolescents was beneficial, especially through cultural knowledge sharing (Adams et al., 2015). Utilizing longstanding community-based participatory research (CBPR) partnerships, researchers in Alaska were able to develop and test a suicide and substance use prevention intervention (Allen et al., 2018; Mohatt et al., 2014).

Interventions focused on other mental health outcomes as well. An intervention in Canadian aboriginal youth showed that mentored youth had less social anxiety and emotional problems than youth without a mentor, a finding not shared with non-aboriginal youth (DeWit et al., 2017). Similarly, Crooks et al. (2017) found that a culturally relevant mentoring program improved intra/interpersonal skills and the cultural and health knowledge base of youth. The "Fostering Open eXpression among Youth (FOXY)" intervention, including body mapping for 41 female youth, led to qualitative themes about coping mechanisms (Lys, 2018). In another study, a decolonizing framework guided the intergenerational participatory workshop for urban, Indigenous females in Canada that provided qualitative data regarding historical trauma effects (Cooper et al., 2019). Barnett et al. (2020) conducted a pilot study of culture camps in Alaska and found improved psychosocial outcomes in adolescents. Ritchie et al. (2014) found that adolescents attending a 10-day outdoor camp intervention in Canada had higher resilience scores than controls after the camp; however, resilience scores returned to baseline after one-year, leading Ritchie and colleagues to hypothesize that intervening historical events may have contributed.

DISCUSSION

The most impressive change in the Indigenous youth resilience literature found through systematic reviews from 1988-2013 and 2014-2021 is the volume of peer-reviewed articles; the prior 25-year period accounted for 51 articles (Burnette & Figley, 2016) and the latter seven-year period for 78 articles. The expansion of the population to Canada accounted for 18 of the 78 articles. Not only the volume but the complexity of research studies has increased, consistent with Social Ecology of Resilience theory. Large, longitudinal, and multi-site studies in the present review allowed for multiple research articles to be published from one study. Shared authorship was noted across several studies or interventions, which demonstrated the challenge of summarizing resilience research. Most studies used quantitative research designs that contributed objectivity, generalization, and prediction to the literature base for Indigenous youth resilience (Slevitch, 2011). The current search resulted in substantially more qualitative studies than the original (Burnette & Figley, 2016). Qualitative research allows for rich data that is passed verbally, more like Indigenous knowledge transmission than traditional Euro-American quantitative metrics (Auger, 2016). Qualitative themes can provide deeper understanding of resilience factors and how resilience may be atypical and context specific. Similarly, the present review had a representation of mixed methods studies that was not identified in the prior review. Mixed methods research pairs

well with emancipatory theories such as postcolonial and Indigenous theory (Creswell & Plano Clark, 2018, p. 45) and mixed methods were the foundation for the Social Ecology of Resilience theory (Ungar, 2008, 2011a, 2011b). Through multiple methodologies, researchers are accessing new and relevant findings about resilience in Indigenous youth.

Interventional Research

The examples of current and ongoing culturally relevant interventions from the present review suggest a plethora of meaningful work across Indigenous populations that is closing this gap. Slightly more than half of the articles ($n = 41$) followed a CBPR approach. CBPR is a partnership between researchers and the community through every stage of research design that addresses health equity by empowering the communities (Wallerstein & Duran, 2010). Although not a specific methodology, the CBPR approach is recommended for research with Indigenous populations (Jernigan et al., 2015; Jumper-Reeves et al., 2014). Burnette and Figley (2016) did not report on the use of CBPR, but the past decade has seen a surge of the use of CBPR studies and evidence that CBPR can improve health equity outcomes (Oetzel et al., 2018). Some use of CBPR may have been missed due to articles reporting on secondary analysis. The increased use of CBPR, qualitative methodology, and mixed methods are encouraging advances of rigor in the field of Indigenous youth resilience. If research about Indigenous youth continues along a trajectory like that of the past seven years, the resulting cultural prevention and intervention programs for Indigenous youth will enhance health equity.

Comparison of Updated Review to the Original

In the original systematic review by Burnette and Figley (2016), each article was organized into one domain of the Social Ecology of Resilience theory so that the sum of individual factors (13%), familial factors (41%), community factors (23%), cultural factors (16%), and societal factors (7%) totaled 100% (see Figure 8). The present review's breadth and depth of research findings made selecting one overarching domain infeasible. Risk and protective factors are complex and interactive (Ungar, 2019), so the compilation of findings from each study was organized into categories that were not mutually exclusive. This updated systematic review revealed individual factors (86%), familial factors (53%), community factors (61%), cultural factors (50%), and societal factors (19%). Most studies had resilience findings that interacted across multiple domains. Although there is limited ability to compare these factors to the review

by Burnette and Figley, the following discussion by theoretical domain considers changes over time and other current research. Referring again to the Social Ecology of Resilience theory, the empirical risk and protective factors of resilience found in this review represent the promotive processes needed in resilience research (Ungar, 2019).

Individual Domain

Individual-level factors, which ranked first among the ecosystem domains in the present review, were more highly represented than in the original review by Burnette and Figley (2016), where the individual level was the fourth most common domain. The protective and risk factors found across both reviews were consistent. Additional protective factors in the present review were the constructs of Reasons for Life (Allen et al., 2019), and Reflective Processes (Allen et al., 2014), belonging, help-seeking, life skills, and hope. The increased use of qualitative methodology, which often involves one-on-one interviews, may reflect the increased data about individual-level factors of resilience. Another reason for increased individual factors in the present review may be the expanded search terms used ("adaptation, psychological"; "resilience, psychological"; "coping"; "vulnerability"; "suicide"; and "health risk behaviors"). These terms are conceptually related to the individual domain and therefore may have filtered more studies with individual resilience factors.

Individual protective factors found in a published literature review of AI/AN adolescent well-being (Henson et al., 2017) included current and/or future aspirations, personal wellness, positive self-image, and self-efficacy. The present review extends this evidence to a larger group of Indigenous youth using rigorous methods of a systematic review protocol. What remains lacking for Indigenous youth is research about the relationship of individual stress, trauma, and resilience (Zahradnik et al., 2010). The emerging science of physiological and immune markers of psychological resilience including cortisol, DHEA, cytokines, and heart rate variability (Daruna, 2012; Walker et al., 2017) may hold promise for knowledge about individual factors of Indigenous youth. For example, John-Henderson et al. (2019) created a biomedical program of research in the Blackfeet tribal community and used biomarkers to measure the effects of trauma in young AI/AN adults. It is critical to find culturally centered and acceptable approaches to using new scientific technologies such as that of John-Henderson et al. to address health disparities.

Familial Domain

Decentralizing the individual with respect to Social Ecology of Resilience theory (Ungar, 2011a, 2011b) begins with the familial domain. Familial factors ranked first among the five ecosystem domains in the original review, yet the familial domain was ranked third in the present review. The present review had a larger number of intervention studies which may not have been directed towards families, as youth are more accessible in school-based or youth service programs. Despite less emphasis in current research on the family, risk and protective factor findings were consistent. Positive relationships with adults were protective in the present review but had more evidence in the earlier review in relation to family caring, support, warmth, sanctions, disapproval, and communication (Burnette & Figley, 2016). Future research about substance use and suicide prevention for Indigenous youth needs to investigate how modifiable familial-level risk and protective factors can be incorporated into resilience interventions. Other relevant research by Oré et al. (2016) demonstrated through the life course framework of resilience that intergenerational knowledge sharing within families through stories and narratives could increase AI/AN youth resilience.

Community Domain

The earlier systematic review by Burnette and Figley (2016) included findings congruent with the present review for most of the community-level factors, which ranked second in both systematic reviews. A few differences were noted. For example, the earlier review included evidence related to community safety that was not emphasized in the present review, while the current literature introduced new research on mentoring programs (Crooks et al., 2017; DeWit et al., 2017), youth leadership programs (Saskamoose et al., 2016; Wexler et al., 2016), and bullying (Gloppen et al., 2018; Kral et al., 2014). The original review found that peer factors offered more protection than risk, while most of the recent evidence suggested that peer influence had negative effects on resilience. School-based prevention interventions were present in the earlier review but more common in the updated review, suggesting continued attention to community-level health promotion strategies. Novel interventions for Indigenous youth have been reported in the literature that did not meet our inclusion criteria, such as an effective text messaging intervention for mental health wellness in AI/AN youth ages 15-24 (Craig Rushing et al., 2021). It is imperative to consider

the community-level resilience factors when developing, adapting, implementing, and evaluating new interventions to promote Indigenous youth resilience.

Cultural Domain

Cultural-level factors of resilience were represented in more than half of the articles in the present review and ranked fourth among the five ecosystem domains. The cultural domain evidence was third most prevalent in the review by Burnette and Figley (2016). The earlier review found mixed evidence for the role of ethnic identity in resilience of AI/AN youth, while the present review found overall more support for ethnic identity as a protective factor than as a risk for Indigenous youth. New evidence was found in the present review for the protective themes of Indigenous identity as being fluid (Jette & Roberts, 2016), grounded via nature (Lys et al., 2018), and expressed using the arts (Evans et al., 2018; Lys et al., 2018). Religion and/or spirituality was reported by Burnette and Figley to be a context-dependent protective factor of mental health and substance use problems, and this was sustained in the present review. Current literature showed mixed findings regarding the protective effects of spirituality for resilience in Indigenous youth, but the positive findings outnumbered the negative. As an example of the complexity of resilience across domains, Indigenous spirituality was associated with negative mental health symptoms but observed effects were attenuated when historical loss and discrimination were added into statistical models (Walls et al., 2016). The relationships between cultural factors and resilience were also compounded when some studies lacked consistent definitions of spirituality and religion or failed to distinguish between the two.

Outside of the present review, recent literature suggests the future of interventions for resilience may include a return to traditional healing (Freeman et al., 2016). Freeman and colleagues provided an average of 13 varied traditional Lakota ceremonies to children with emotional problems and their caregivers. The traditional intervention led to statistically significant improvements in family functioning and child resilience. A review of literature on Inuit suicide prevention programs offered compelling evidence for including the restoration of cultural pride as a priority (Morris & Crooks, 2015). Others provided concrete advice for health providers treating depression and suicidal ideation in AI/AN youth with guidance on balancing Indigenous values in the postcolonial world (Livingston et al., 2019). A new AI/AN cultural resilience scale was developed by Kelley and Lowe (2018) to measure community cultural knowledge and connections,

language usage, sense of community and attachment, and intergenerational connections. Current literature places a strong emphasis on the role of culture in resilience of Indigenous youth.

Societal Domain

Societal factors of resilience had the least reporting in both Burnette and Figley's (2016) review and the present review. However, there was meaningful literature among both reviews that demonstrated the association of historical loss and trauma with mental health symptoms in Indigenous youth. The older review only identified a few societal risk factors while the present review summarized several risk factors and several protective factors at the societal level. Most studies in the earlier review called for more empirical research about societal factors, a call that was partially addressed in the subsequent research studies of the present review. Aside from more empirical evidence, the present review found the use of decolonizing theoretical frameworks to ground the methodology (Cooper et al., 2019; Jette & Robets, 2016), something not noted in the earlier review. Decolonizing theories strengthen research with Indigenous peoples because they challenge the dominant Euro-American research methodologies and unveil power systems that sustain health disparities (Smith, 2012).

Other current research supports the review findings regarding the societal factors of resilience. Gone et al. (2019) conducted a systematic review of Indigenous historical trauma related to health outcomes of adults and provided sound evidence for historical trauma as an explanation for contemporary health disparities. A scoping review by Toombs et al. (2016) of resilience in Indigenous Canadian youth emphasized the need to incorporate Indigenous models into research. Similarly, Walters et al. (2018) called for Indigenous CBPR processes in research, which prioritize local knowledge, health positive messages, and culturally grounded designs. Future research of Indigenous youth resilience at the societal level is likely to follow the emerging themes of climate change as a risk factor. For example, MacDonald et al. (2015) demonstrated how changing sea ice and weather conditions compromised safe access to being on the land for the Nunatsiavut (Inuit) youth ages 15-25 in Canada.

A Comparison to Other Reviews of AI/AN Youth Resilience and Risk

Several other systematic reviews about resilience in AI/AN youth have been conducted since 2014, each smaller and with slightly different objectives and findings than those of Burnette

and Figley (2016). Teufel-Shone et al. (2018) reviewed three adolescent studies along with five adult studies and called for less focus on deficits and more on ecological strengths, assets, and resilience. Oré et al. (2016) also performed a systematic review of AI/AN resilience as related to the life course framework and concluded that resilience is a dynamic process, is developed intergenerationally and collectively, and gained from cultural wisdom and practice. A scoping review of resilience interventions in the school setting for international Indigenous adolescents found 16 moderate-to-high quality studies but a lack of validated resilience measurements (Jongen et al., 2019). Jongen et al. (2019) highlighted the need for a balance between culturally tailored and relevant instruments and standardized measures that can be generalized to other Indigenous populations. Meanwhile, Rountree and Smith (2016) searched the international literature to produce a cumulative qualitative dataset of well-being measures that aligned with Indigenous beliefs and were useful in promoting Indigenous youth's health. Henson et al. (2017) synthesized the evidence base for protective factors of AI/AN adolescents that increased desirable health and social outcomes or prevented undesirable outcomes such as substance abuse. Henson et al. (2017) called for better measurement tools to focus more on promotive and protective factors for AI/AN adolescent well-being. The present systematic review adds to these smaller reviews by capturing the developing knowledge base of resilience in Indigenous youth and categorizes findings across the Social Ecology of Resilience theory (Ungar, 2008, 2011a). Furthermore, the theory-driven updated review demonstrates how resilience is a trait as well as a mechanism through which youth can utilize their strengths in response to adversity.

Strengths of this Systematic Review

A major strength of this systematic review was the team of authors who collaborated to conduct the review and explore the challenges in measuring resilience amongst Indigenous youth. The first author is White, and the other authors are members of the Diné (Navajo) Nation, Acoma Pueblo, and Turtle Mountain Band of Chippewa Indians. With increasing diversity in academia, there is a dire need to include the perspectives of the communities being researched. This type of collaboration allows for a theory-driven and culturally centered process of reviewing the literature. This review was guided by the Social Ecology of Resilience theory (Ungar, 2008, 2011a, 2011b), which allowed for a structured means of presenting findings and encouraged a deliberative process of critical reflection on the findings and interpretation of studies.

Limitations of this Systematic Review

An important limitation of this review is the inability to generalize findings from specific Indigenous populations to others. Different Indigenous peoples have unique histories, languages, cultures, and spiritual beliefs that affect resilience and risk factors in their youth. A concise list of resilience factors was presented within theoretical domains despite being from vastly different sample populations. Findings from any given study do not necessarily apply to other Indigenous youth populations. Another weakness of this review is that the studies had differences in theoretical and methodological approaches to resilience across 78 studies (Ungar, 2011, p. 45). Because the search was limited to peer-reviewed journals in the English language, pertinent information that captured Indigenous knowledge may have been omitted. Evaluation of the quality of studies was done using rigorous criteria (GRADES and JBI), but meta-analysis on quantitative data was not possible due to the heterogeneity of study design and methodology. The quantitative studies reviewed were mostly low to moderate quality. Many studies were rated lower for methodologies, such as cross-sectional designs that do not allow for analysis of causation or an understanding of the dynamic mechanisms of resilience. However, strong CBPR partnerships allowing for Indigenous peoples' participation throughout the studies increased rigor and were considerations in quality evaluations (Page et al., 2021).

Implications for Clinical Practice and Future Research

The present review is a source for aggregated findings about resilience factors and research programs for Indigenous youth in the United States and Canada. Multidisciplinary professionals can draw from the Social Ecology of Resilience theory (Ungar, 2008, 2011a) domains when providing care or creating prevention interventions. For example, counselors and educators could provide a culturally tailored curriculum on peer relations and peer pressure to optimize individual- and community-level influences. Public health nurses could provide parenting classes based on the needs of their community to address familial-level factors of resilience. Physicians and health care providers could incorporate traditional healing and ceremonies as a cultural-level intervention. Community activists, public health leaders, and all health care workers could identify and remedy societal-level systems within an Indigenous community that sustain systemic racism practices in health care.

This body of knowledge will likely lead to more interdisciplinary and creative research to inform health prevention strategies and upstream programs to enhance well-being for Indigenous children and adolescents. The diversity in the way resilience was being studied across studies indicated that the definition of resilience amongst Indigenous communities is vast and may require frequent re-evaluation and defining. Additionally, the updated literature continues to show that effects of historical trauma on mental health outcomes warrant more research (Cooper et al., 2019; Evans & Davis, 2018). Another persisting gap in the literature is resilience research with urban populations of Indigenous youth (Brown et al., 2021; Bush & Qeadan, 2020). In addition to attention to empirical societal-level factors of resilience for Indigenous youth, the authors propose an expansion of the Social Ecology of Resilience theory (Ungar, 2008, 2011a) to include more cultural and societal details within the domains.

CONCLUSION

This updated systematic review of risk and resilience factors for the mental health of Indigenous youth in North America resulted in an abundance of research; the number of studies retrieved from the past seven years far exceeded that of the previous 25 years. Risk and protective factors of mental health in Indigenous youth in the United States and Canada have a meaningful literature base with the potential to improve the mental health and well-being of Indigenous youth. Ample literature concerning individual, familial, community, cultural, and societal factors of resilience is available to contribute to developing resilience-enhancing programs for Indigenous youth in the United States and Canada. Increasingly, researchers are using the CBPR approach, conducting more experimental studies, and are evaluating interventions for improving mental health for Indigenous youth. Interrelated forms of knowledge are being produced by quantitative, qualitative, and mixed methods research of resilience of Indigenous youth. Meanwhile, the theoretical foundations of research are met with the construct of resilience. Further attention is needed to understand Indigenous knowledge systems and the influence of racism, settler colonialism, and cultural resurgence efforts related to Indigenous youth well-being.

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CONFLICT OF INTEREST

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APPENDIX

Table A1
Characteristics of included research, summary of results, critical appraisal/quality assessment

First Author and Year	Study Design, Methodology, and Sample	Setting and Indigenous Population	Theory and SER Level	Mental Health Outcomes Assessed or Measured	Key/ Significant Findings	Quality Assessment
Adams (2015)	*Study design:* Exploratory case study; 6 months per participant *Methodology:* Qualitative *Sample:* Females ages 12-18 years (n=26)	*Setting:* Canada, HC *Indigenous Population:* First Nations	*Theory:* Medicine wheel; bio-psycho-social-spiritual CBPR *SER:* I, F, C, Cu	Substance use prevention, well-being	Equine assisted therapy at a residential inhalant treatment center was found to be useful, especially through cultural knowledge sharing. Of 28 themes that emerged, the most important were: safe touch, physical health improvements, learning about anatomy.	JBI: Moderate
Allen (2014)	*Study design:* Cross sectional strand of a mixed methods study; empirically testing a model *Methodology:* Quantitative *Sample:* Ages 12-17 years (n=61)	*Setting:* Alaska, RR, Sc *Indigenous Population:* Yup'ik	*Theory:* Ecological theory CBPR *SER:* I, F, C, Cu	Suicide and substance use prevention, Reflective Processes, and Reasons for Life	The first empirical test of a model of protective factors of AN people for alcohol use and suicide. Reasons for Life and Reflective Processes were found to be appropriate intermediate prevention strategy target variables in a multilevel intervention.	GRADES: Low
Allen (2018)	*Study design:* Nonrandomized comparative intervention; 1 year *Methodology:* Quantitative *Sample:* Ages 12-18 years (n=413)	*Setting:* Alaska, RR, C *Indigenous Population:* Yup'ik	*Theory:* Yup'ik Indigenous Theory of Change CBPR *SER:* I, F, C	Substance use prevention, peer influences, Reflective Processes, Reasons for Life	Culture as intervention: The intensive Qungasvik version of the intervention compared to less intense Qungasvik version of the intervention had significant effects on suicide protective factors. The intervention had significant effects on Reasons for Life but not Reflective Processes.	GRADES: Moderate

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First Author and Year	Study Design, Methodology, and Sample	Setting and Indigenous Population	Theory and SER Level	Mental Health Outcomes Assessed or Measured	Key/ Significant Findings	Quality Assessment
Allen (2019)	*Study design:* Measurement development and instrument validation *Methodology:* Quantitative *Sample:* Ages 12-18 years (male= 141; female=161; n=302)	*Setting*: Alaska, RR, C *Indigenous Population*: Yup'ik, Inupiat, Athabascan, Aleut, Tlingit/Haida, and Tsimshian	*Theory:* Not specified CBPR *SER:* I, F, C, Cu	Suicide prevention, resilience, social connectedness	Findings demonstrate Reasons for Life as a protective factor from suicide and can be measured as a complex, multidimensional construct. Protection is associated with a) beliefs in ability to surmount life's greatest difficulties, b) cultural and spiritual beliefs about the value of one's life, and c) perceptions that people in one's social network view them as making positive contributions to others.	GRADES: Very Low
Barnett (2020)	*Study design:* Quasi-experimental, pre-post survey, 5-day camp *Methodology:* Quantitative *Sample:* Ages 13-18 years (n=69); 81 completed pre-survey; 69 completed post-survey	*Setting:* Alaska, RR, Camp *Indigenous Population:* Iñupiaq, Central Yup'ik, St. Lawrence Island Yup'ik	*Theory:* Not specified *SER:* Cu	Suicide prevention, positive and negative affect, problem-focused coping	A pilot evaluation of a 5-day culture camp in remote Alaska. Subsistence activities, developing relationships and life skills, and learning traditional knowledge and values were emphasized. Significant improvements after the camp were shown in in mood scores, sense of belonging, and ability to cope.	GRADES: Low

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First Author and Year	Study Design, Methodology, and Sample	Setting and Indigenous Population	Theory and SER Level	Mental Health Outcomes Assessed or Measured	Key/ Significant Findings	Quality Assessment
Baydala (2014)	*Study design:* Quasi-experimental, 3-year longitudinal pre-test/posttest with comparison group *Methodology:* Mixed methods *Sample:* ages 9-19 years (n= 16 for high schoolers; n ranged from 13-19 for elementary age intervention groups)	*Setting:* Canada, RR, Sc *Indigenous Population:* Alexis Nakota Sioux Nation	*Theory:* Not specified CBPR *SER:* I, F, C, Cu, S	Substance use prevention	Cultural adaptation of alcohol and substance abuse program (life skills training). Qualitative results: the adapted program was highly valued especially due to the inclusion of Isga language, history, and culture. Quantitative results: poor attendance affected the analysis. Results of the Piers-Harris self-concept scale and the life skills training questionnaire were mixed.	GRADES: Moderate JBI: Moderate
Belone (2017)	*Study design:* Pilot study, 5 months *Methodology:* Mixed methods *Sample:* Grades 3-5 (n=11)	*Setting:* Contiguous US/WEST, RR, C *Indigenous Population:* Mescalero Apache	*Theory:* Not specified CBPR *SER:* I, C	Substance use prevention, well-being, cultural identity	Family listening/family circle program. Qualitative: participants learned how to trust and give support, and new skills related to problem solving, ways of listening, anger control and ways of supporting their community. Quantitative: Significant improvements in cultural identity and problem-solving and decreased depression and anxiety symptoms after intervention. Positive coping skills and strong cultural identity were identified as protective factors.	GRADES: Moderate JBI: Moderate

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First Author and Year	Study Design, Methodology, and Sample	Setting and Indigenous Population	Theory and SER Level	Mental Health Outcomes Assessed or Measured	Key/ Significant Findings	Quality Assessment
Brockie (2015)	*Study design:* Cross sectional *Methodology:* Quantitative *Sample:* Ages 15-19 years (n=166)	*Setting:* Contiguous US/WEST, RR, Sc *Indigenous Population:* Northern Plains	*Theory:* Not specified *SER:* I, F, S	Depression, suicide, substance use, risk behaviors, depression, poly drug use, suicide attempt, posttraumatic stress disorder, ACEs, historical loss, discrimination	78% percent of the sample reported at least one Adverse Childhood Experience (ACE) and 40% reported at least two. The cumulative impact of the ACEs was significant for the four outcomes with each additional ACE increasing the odds of suicide attempt (37 %), poly-drug use (51 %), posttraumatic stress disorder symptoms (55 %), and depression symptoms (57 %).	GRADES: Low
Brown (2016)	*Study design:* Longitudinal instrument development study with focus groups *Methodology:* Qualitative *Sample:* Ages 14-18 years (n=30)	*Setting:* Contiguous US/WEST, Urban, C *Indigenous Population:* Not specified	*Theory:* Not specified CBPR *SER:* I, F, C, Cu, S	Substance use prevention, cultural identity	Risk factors for youth alcohol and drug use by themes: intergenerational stressors, cultural disconnection, pan-tribal identity, mixed racial-ethnic identity, rural and urban environments are two different worlds, stereotypes and harassment, risks of being AI/AN, and mainstream culture clash. Protective factors: AI/AN identity, the importance of AI/AN institutions.	JBI: High
Brown (2021)	*Study design:* 3-year longitudinal *Methodology:* Quantitative *Sample:* Ages 14-18 years (n=185)	*Setting:* Contiguous US/WEST, Urban, C *Indigenous Population:* Urban AIs in California	*Theory:* Not specified CBPR *SER:* I, C, Cu	Substance use, risk behaviors, well-being	Adolescents self-identifying as AI/AN were compared with adolescents of other racial-ethnic identities. Adolescents who identified as AI/AN on their survey reported better mental health, less alcohol and marijuana use, lower rates of delinquency, and increased happiness and spiritual health.	GRADES: Moderate

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First Author and Year	Study Design, Methodology, and Sample	Setting and Indigenous Population	Theory and SER Level	Mental Health Outcomes Assessed or Measured	Key/ Significant Findings	Quality Assessment
Bush (2020)	*Study design:* Retrospective, descriptive cross sectional (3 time points) *Methodology:* Quantitative *Sample:* Grades 9-12 (N=53,773: 2011=18,763; 2013=19,080; 2015=15,930)	*Setting:* Contiguous US/WEST, RR and Urban, Sc *Indigenous Population:* Not specified	*Theory:* Interpersonal-psychological theory of suicidal behavior by Thomas Joiner *SER:* I, F, C	Suicide attempt, social support	New Mexico Youth Risk and Resiliency Survey 2015 results were analyzed. A reduction in the likelihood of suicide attempt was associated with interpersonal-level protective factors among AI/AN adolescents. Low social support was a risk factor for youth on reservations or rural but not for youth in urban areas.	GRADES: Low
Chambers (2021)	*Study design:* Pre/post intervention *Methodology:* Quantitative *Sample:* Females. Ages 8-11 (n=47) plus female caregiver (n=47)	*Setting:* Contiguous US/WEST, RR,C *Indigenous Population:* Navajo, 2 communities	*Theory:* Not specified CBPR *SER:* I, F, Cu	Depression, anxiety, substance use, language, cultural knowledge, self-esteem	Preliminary results from the Asdzáán Be'eená (Female Pathways) intervention included: higher cultural Navajo knowledge and language knowledge reported by the girls after the program. Self-esteem, self-efficacy, and social support were increased post-intervention. The program was associated with lower internalizing behaviors (anxious/depressed, withdrawn, somatic complaints) and improved relationship with caregiver.	GRADES: Moderate

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First Author and Year	Study Design, Methodology, and Sample	Setting and Indigenous Population	Theory and SER Level	Mental Health Outcomes Assessed or Measured	Key/ Significant Findings	Quality Assessment
Cooper (2019)	*Study design:* Intergenerational participatory workshops; 2-3 hours per week over 7 weeks *Methodology:* Qualitative *Sample:* Females grades 8-12 (n=36 girls plus n=24 women)	*Setting:* Canada, Urban, C *Indigenous Population:* First Nations and Métis	*Theory:* Decolonization framework CBPR *SER:* I, F, Cu, S	Well-being, historical trauma	A 7-week participatory workshop for First Nations and Métis women and girls was conducted three times following a decolonizing framework. Qualitative findings about safety, wellbeing, and historical trauma found harm-reduction and self-determination as important themes.	JBI: Moderate
Crabtree (2020)	*Study design:* Descriptive cross sectional, two cohorts *Methodology:* Quantitative *Sample:* 7th graders (n=379)	*Setting:* Contiguous US/WEST, RR, Sc *Indigenous Population:* Northern Plains	*Theory:* Theory of reasoned action and self-determination theory *SER:* I	Substance use, future orientation, and self-determination	Future orientation and self-determination were both predictive of intention to use alcohol or marijuana in the next 3 months. Negative consequences of alcohol/marijuana use for future goals and autonomy were moderators.	GRADES: Low
Crabtree (2021)	*Study design:* RCT with 6 middle schools *Methodology:* *Sample: 7th graders (n=445)*	*Setting:* Continuous US/WEST, RR, Sc *Indigenous Population:* Northern Plains	*Theory:* Self-determination theory CBPR *SER:* I, C, Cu	Alcohol and marijuana use	The culturally adapted "Be Under Your Own Influence" intervention was associated with a lower risk of initiating alcohol use (34% reduction) and lower first-time alcohol intoxication (36% reduction) but had no effect on marijuana use.	GRADES: High

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First Author and Year	Study Design, Methodology, and Sample	Setting and Indigenous Population	Theory and SER Level	Mental Health Outcomes Assessed or Measured	Key/ Significant Findings	Quality Assessment
Crooks (2015)	*Study design:* Case study *Methodology:* Qualitative *Sample:* Adults (n=12)	*Setting:* Canada, RR and Urban, Sc *Indigenous Population:* First Nations, Métis, Inuit	*Theory:* Not specified *SER:* I, Cu	Cultural identity, connectedness	Thematic content analysis of adult stakeholder's perspectives on youth's response to the Fourth R intervention. Themes of improvement were found after intervention and reviewed in detail: 1) identity and belonging and 2) cultural connectedness. Other themes included leadership of students and shame.	JBI: Low
Crooks (2017)	*Study design:* Exploratory, 3 years longitudinal *Methodology:* Mixed methods *Sample:* Elementary and secondary school age (n=133)	*Setting:* Canada, Sc *Indigenous Population*: First Nations, Métis, Inuit (FNMI)	*Theory:* Medicine Wheel life cycles CBPR *SER:* I, C, Cu	Well-being, cultural identity	A mentoring program helped youth develop intrapersonal and interpersonal skills and enhanced their knowledge base of culture and healthy relationships. Multiple years of culturally relevant mentoring is a promising approach for promoting well-being among FNMI youth.	GRADES: Moderate JBI: Moderate
Cwik (2015)	*Study design:* Cross sectional *Methodology:* Quantitative *Sample:* Ages 10-19 years (n=71)	*Setting:* Contiguous US/WEST, RR, C *Indigenous Population:* White Mountain Apache	*Theory:* Not specified CBPR *SER:* I, F, C, Cu	Depression, suicide, substance use, risk behaviors, social and adaptive functioning, problem solving skills, cognitive processing	AI youth who had attempted suicide completed surveys. More than half had a loved one attempt suicide within 6 months prior. Nearly half lost a loved one to suicide death in their lifetime. Risks were suicide behaviors in peers or family, caregivers with substance use disorders, and personal use of alcohol or marijuana. Resilience factors included cultural participation and lower depression scores.	GRADES: Low

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First Author and Year	Study Design, Methodology, and Sample	Setting and Indigenous Population	Theory and SER Level	Mental Health Outcomes Assessed or Measured	Key/ Significant Findings	Quality Assessment
Cwik (2016)	*Study design:* Pilot study of an open trial design (1-, 2-, and 3-months post-emergency department visit) *Methodology:* Quantitative *Sample:* Ages 10-19 years (n=13)	*Setting:* Contiguous US/WEST, RR, HC, C *Indigenous Population:* White Mountain Apache	*Theory:* Not specified CBPR *SER:* I, C, Cu	Trial of a brief intervention for suicide prevention	New Hope intervention identified youth who visited the emergency department for suicide attempt within a 90-day timeframe to pilot test a brief evidence-based intervention adapted to the culture. Preliminary findings suggest decreases in negative thinking, depression, and suicidal ideation after the intervention. There was also an increased use of psychological service use.	GRADES: Low
Cwik, (2017)	*Study design:* Cross sectional and case control (10 months) *Methodology:* Quantitative *Sample:* Ages 10-19 years (n=68 plus n=55 controls)	*Setting:* Contiguous US/WEST, RR, C *Indigenous Population:* White Mountain Apache	*Theory:* Not specified CBPR *SER:* I	Risk behaviors, protective factors, exploration of pathways to binge drinking, cultural identity	Stressful life events were related to family functioning and peer relationships. Family functioning affected peer relationships and adolescent impulsivity which were both associated with greater risk of binge drinking. Path between peer relationship and engaging in binge drinking was statistically significant for those expressing lower cultural identity.	GRADES: Moderate

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First Author and Year	Study Design, Methodology, and Sample	Setting and Indigenous Population	Theory and SER Level	Mental Health Outcomes Assessed or Measured	Key/ Significant Findings	Quality Assessment
Cwik, (2018)	*Study design:* Cross sectional case control with ACASA (Audio Computer Assisted Self-Interview) *Methodology:* Quantitative *Sample:* Ages 10-19 years (n=69)	*Setting:* Contiguous US/WEST, RR, H *Indigenous Population:* White Mountain Apache	*Theory:* Not specified CBPR *SER:* I, F, C	Suicide, substance use, characteristics of AI youth who recently engaged in binge drinking	Adolescents who had a serious incident of binge drinking in the past 90 days were surveyed. 47% reported lifetime suicide thoughts. 53.7% used alcohol alone or with marijuana (31.3%). Median age of first suicide thoughts was 14.0. Median age first alcohol use was 13.0; marijuana was also 13.0. Reasons for substance use included stress, family problems, fight with girlfriend/boyfriend or peers, and "can't remember" or "no reason in particular."	GRADES: Low
D'Amico (2019)	*Study design:* Longitudinal 4 years *Methodology:* Quantitative *Sample:* Ages 14-18 years (n=185)	*Setting:* Contiguous US/WEST, Urban, C *Indigenous Population:* AIs in northern, central, and southern California	*Theory:* Not specified CBPR *SER:* I	Substance use, risk behaviors, well-being, discrimination, mental health status, cultural pride, traditional practices	Marijuana was the most frequently reported substance used followed by alcohol and e-cigarettes. Very few adolescents reported lifetime use of prescription drugs or stimulants; some reported that spirituality, religion, or beliefs affected their health. 68% indicated that they felt good about their cultural background and were happy with being a member of the AI tribal group. Most frequent traditional practices were powwow, learning tribal history, eating Native foods, and prayer.	GRADES: Moderate

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First Author and Year	Study Design, Methodology, and Sample	Setting and Indigenous Population	Theory and SER Level	Mental Health Outcomes Assessed or Measured	Key/ Significant Findings	Quality Assessment
Davis (2019)	*Study design:* Exploratory, descriptive *Methodology:* Quantitative *Sample:* Grades 7-12 (n=1,934)	*Setting:* Contiguous US/WEST, Contiguous US/EAST, RR, Sc *Indigenous Population:* AI students in seven regions across the US	*Theory:* Not specified *SER:* I, Cu, S	Ethnic identity, religious importance, ethnic pride, and perceived discrimination	Among AI youth, the class with strong motives to drink for coping or enhancement had higher ethnic identity, greater risk of heavy episodic drinking, and greater perceived discrimination compared with the class with low motives.	GRADES: Low
DeWit (2017)	*Study design:* Quasi-experimental, pre-post design (baseline and 18 months) *Methodology:* Quantitative *Sample:* Aboriginal and non-aboriginal children in the Big Brothers Big Sisters of Canada program, ages 6-17 (n=125)	*Setting:* Canada, RR and U, C, H *Indigenous Population:* First Nations, Métis, Inuit	*Theory:* Not specified *SER:* C	Anxiety, conduct problems, ADHD symptoms, emotional problems, peer-related problems, prosocial behavior, and social anxiety	Structural equation modeling found that mentored aboriginal youth had significantly less emotional problems and social anxiety after the mentorship than non-mentored youth. This relationship was not found for mentored non-aboriginal youth.	GRADES: High

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First Author and Year	Study Design, Methodology, and Sample	Setting and Indigenous Population	Theory and SER Level	Mental Health Outcomes Assessed or Measured	Key/ Significant Findings	Quality Assessment
Eitle (2014)	*Study design:* Cross sectional *Methodology:* Quantitative *Sample:* Ages 12-19 years (n= 568; American Indian= 125; Caucasian= 443)	*Setting:* Contiguous US/WEST, Contiguous US/EAST, RR, Sc *Indigenous Population:* Not specified	*Theory:* Stress-coping model *SER:* I	Substance use, past year alcohol/marijuana use and coping strategies	No significant differences in AI and white students' use of types of coping strategies, however some risk behaviors differed. Being AI was not a risk factor for alcohol use, but it was a risk factor for marijuana use. Self-distraction (an avoidant coping strategy) was associated with more marijuana use in AI, but less marijuana uses in white students.	GRADES: Low
Ersan (2021)	*Study design:* Cross sectional *Methodology:* Quantitative *Sample:* 8th, 9th, and 11th graders (n=3,736)	*Setting:* Contiguous US/WEST, U, Sc *Indigenous Population:* Anishinaabe/ Ojibwe, Dakota/Lakota and other tribal affiliations	*Theory:* Positive Youth Development theory and Circle of Courage *SER:* I, F,C	Mental distress, ACEs, being bullied, family/community support, sense of empowerment, out of school time activity	Risk factors in the study included having experienced trauma, being bullied by peers, substance use, and skipping school. Protective factors were social supports, out-of-school-time activities, healthy eating, and healthy sleeping behaviors. The protective factors moderated the effects of risk behaviors on mental distress.	GRADES: Low

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First Author and Year	Study Design, Methodology, and Sample	Setting and Indigenous Population	Theory and SER Level	Mental Health Outcomes Assessed or Measured	Key/ Significant Findings	Quality Assessment
Evans (2018)	*Study design:* Cross sectional and semi-structured, arts-based interview 40+ minutes per child *Methodology*: Mixed methods *Sample*: Ages 14-18 years (n=57; survey n=30 and interviews n=27)	*Setting:* Contiguous US/WEST, RR, Sc *Indigenous Population:* Unidentified Western US tribal community	*Theory:* Sense of Coherence - Salutogenesis, (Antonovsky, 1987) *SER:* I, S	Historical trauma	Quantitative: higher levels of sense of coherence significantly predicted lower levels of historical trauma symptoms. Qualitative: Stress themes included: family conflict, loss, school stress and isolation. Coping themes included: AI culture, sports, art and music, and family.	GRADES: Low JBI: Moderate
FitzGerald (2017)	*Study design:* Cross sectional *Methodology*: Quantitative *Sample*: Grades 9-12 (n=2,792)	*Setting:* Contiguous US/WEST, RR and Urban, Sc *Indigenous Population:* Not specified	*Theory:* Not specified *SER:* I, F, C	Suicide, relationships with adults, cultural connectedness	Relationships at home, school and in the community were protective for suicide attempt. Language spoken at home (proxy for cultural connectedness) was not statistically associated with suicide attempt.	GRADES: Low
Fullerton (2019)	*Study design:* Cross sectional, exploratory, descriptive, 3 months *Methodology*: Quantitative *Sample*: Grades 9-12 (n=15,930)	*Setting:* Contiguous US/WEST, Sc *Indigenous Population:* Not specified	*Theory:* Not specified *SER:* I, F	Suicide, resilience	Positive relationships with parents, teachers, and other adults can greatly reduce the odds of suicide attempt in AI/AN, Hispanic, and Anglo adolescents. The final multivariable model for AI/AN youth included only positive relationships with adults in the home.	GRADES: Moderate

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First Author and Year	Study Design, Methodology, and Sample	Setting and Indigenous Population	Theory and SER Level	Mental Health Outcomes Assessed or Measured	Key/ Significant Findings	Quality Assessment
Gfellner (2016)	*Study design:* Cross sectional *Methodology:* Quantitative *Sample:* Grades 6-12 (n=178)	*Setting:* Canada, RR, Sc *Indigenous Population:* First Nations	*Theory:* Social Identity theory by Erikson CBPR *SER:* I, Cu	Well-being, ego strengths, ethnic and racial identity, adjustment variables (self-esteem, superior adjustment, mastery and coping, emotional tone)	Ego strengths related directly with centrality, private regard and the adjustment measures. The moderation of ego strengths for exploration, commitment, and private regard reflected adverse functioning for those with less than advanced ego strengths. Ego strengths mediated associations between centrality and private regard with personal well-being.	GRADES: Low
Gloppen (2018)	*Study design:* Cross sectional *Methodology:* Quantitative *Sample:* Grades 5, 8, 9, 11 (n=1,409)	*Setting:* Contiguous US/EAST, RR and Urban, Sc *Indigenous Population:* Tribal community in Minnesota	*Theory:* Not specified *SER:* I, C	Depression, anxiety, protective factors, bullying involvement	All forms of bullying perpetration and victimization were associated with increased risk for mental health problems (odds ratio [OR]: 1.57–2.87). AI youth who reported higher levels of protective factors were less likely to report internalizing symptoms and suicidality even in the presence of bullying involvement.	GRADES: Low
Jette (2016)	*Study design:* Data collection over 2 months, two meetings then one interview *Methodology:* Qualitative *Sample:* Females, ages 11-17 years (n=14)	*Setting:* Contiguous US/EAST, Urban, C *Indigenous Population:* Not specified	*Theory:* Poststructural-ist Theory. Decolonization framework. CBPR *SER:* I, C, Cu, S	Constructions of health and the body, dominant social discourse and role of AI culture and identity	Three themes emerged: 1) Learning about health and bodily norms and negotiating wellness happened mostly at school, and was complex and often contradictory, 2) Participants did not perceive their AI status as conferring risk for health and, 3) AI identity is fluid in nature.	JBI: High

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Characteristics of included research, summary of results, critical appraisal/quality assessment

First Author and Year	Study Design, Methodology, and Sample	Setting and Indigenous Population	Theory and SER Level	Mental Health Outcomes Assessed or Measured	Key/ Significant Findings	Quality Assessment
Komro (2016)	*Study design*: Longitudinal survey 3 surveys each about 3 months apart *Methodology*: Quantitative *Sample*: Females, ages 14-19 years all (n=952); AI youth (n=422)	*Setting:* Contiguous US/WEST, RR, Sc *Indigenous Population:* Cherokee	*Theory:* Not specified *SER:* I, F, C	Substance use Individual and community level factors	AI and non-native responses were mostly similar. Alcohol access, parent communication, and best friend's alcohol use were statistically significant risk factors for past-month alcohol use among AI and non-native females. Depression and exposure to a parent's alcohol problem were not identified as risks for either AI or non-native females.	GRADES: Moderate
Kral (2014)	*Study design*: Ethnography, one interview *Methodology*: Qualitative *Sample*: Ages 12-19 years (n=23)	*Setting:* Canada, RR, Sc *Indigenous Population:* Igloolik, Nunavut	*Theory:* Not specified CBPR *SER:* F, C	Familial relationships, resilience	Thematic findings: stressors included bullying, school, substance misuse, domestic violence, romance. Talking, mostly with friends, was a primary means of coping. Talking with family, being on the land and community activities were also sources of strength.	JBI: Moderate
Kulis (2016)	*Study design*: Cross sectional *Methodology*: Quantitative *Sample*: Ages 12-19 years (n=2,407)	*Setting:* Contiguous US/WEST, U, Sc, C *Indigenous Population:* Tribal community in Arizona	*Theory:* Not specified *SER:* I, F	Substance use, risk behaviors by latent class analysis	Four latent classes emerged: a large group of "nonusers" (69%); a substantial minority using alcohol, tobacco, and/or marijuana (17%); a smaller group of polysubstance users consuming, alcohol, tobacco, marijuana, other illicit drugs, and prescription or over-the-counter drugs in combination (6%); and a "not alcohol" group reporting combinations of tobacco and drug use, but rarely alcohol use (4%). Polysubstance users had the highest risk of problematic behavior. Early adolescent nonusers had fewer problematic behaviors.	GRADES: Low

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First Author and Year	Study Design, Methodology, and Sample	Setting and Indigenous Population	Theory and SER Level	Mental Health Outcomes Assessed or Measured	Key/ Significant Findings	Quality Assessment
Lys (2018)	*Study design*: Semi-structured interviews *Methodology*: Qualitative *Sample*: Females, ages 13-17 years (n= 36)	*Setting:* Canada, RR, Sc *Indigenous Population:* Not specified	*Theory:* Social Ecological Theory by Sallis et al. (2008) *SER:* I, F, C, Cu	Strategies to cope with mental health issues	Fostering Open Expression among Youth (FOXY) intervention included body mapping workshops for 41 female participants followed by an interview. Thematic analysis identified five themes related to coping strategies: grounding via nature, strength through indigenous cultures, connection with God and Christian beliefs, expression using the arts, and relationship with social supports.	JBI: Moderate
Martinez (2015)	*Study design*: Cross sectional *Methodology*: Quantitative *Sample*: Grades 7-8 (n=148)	*Setting:* Contiguous US/WEST, U, Sc *Indigenous Population:* Not specified	*Theory:* Theory of Social Norms *SER:* F, C	Substance use, risk behaviors, social norms	Overall, AI youth had very low substance use intentions. Strong peer and grandparent injunctive norms were associated with less intention to use. Parent injunctive norms, school lunch status and grades in school were not significantly associated with intention to use.	GRADES: Low
Mileviciute (2014)	*Study design*: Self-report survey with path analysis *Methodology*: Quantitative *Sample*: Ages 13-18 (n=146)	*Setting:* Contiguous US/WEST, RR, Camp *Indigenous Population:* Northern Plains	*Theory:* Not specified *SER:* I	Depression, substance use, self-efficacy, externalizing behavior, alcohol	High self-efficacy for resisting negative peer pressure predicted both lower rates of alcohol use and fewer externalizing behaviors. High levels of both academic and social self-efficacy predicted fewer depressive symptoms. Being female was a predictor of depressive symptoms.	GRADES: Low

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First Author and Year	Study Design, Methodology, and Sample	Setting and Indigenous Population	Theory and SER Level	Mental Health Outcomes Assessed or Measured	Key/ Significant Findings	Quality Assessment
Mohatt (2014)	*Study design*: Feasibility intervention study; 1 year in one community; 2 years in another community *Methodology*: Quantitative *Sample*: Ages 12-17 (n=52)	*Setting:* Alaska, RR, C *Indigenous Population:* Yup'ik	*Theory:* Not specified CBPR *SER:* I, F, C, Cu	Community mastery, family characteristics, community characteristics, peer influences, Reflective Processes, Reasons for Life	A suicide and substance use prevention intervention was implemented through two remote community programs: Elluam Tungiinun (Toward Wellness) and Yupiucimta Asvairtuumallerkaawas (Strengthening our Yup'ik Identity). The intervention was found effective with medium dose effects for suicide and alcohol prevention in the community with more intervention resources and small dose effects in the community with less intervention resources.	GRADES: Moderate
Moilanen (2014)	*Study design*: Retrospective, cross sectional *Methodology*: Quantitative *Sample*: Grades 8, 10, 12 (n=5,709)	*Setting*: Contiguous US/EAST, RR and U, Sc *Indigenous Population*: Not specified	*Theory:* Routine Activity theory; Social Control theory; Positive Youth Development and Resilience theory *SER:* I, F, C, Cu	Substance use, drunk or high at school, driving or having a driver intoxicated, selling drugs	High levels of extracurricular availability and intensity predicted low levels of all outcomes (substance use, drunk or high at school, driving or having a driver intoxicated, selling drugs). Some of the associations were moderated by demographics with unique patterns for each behavior.	GRADES: Low

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First Author and Year	Study Design, Methodology, and Sample	Setting and Indigenous Population	Theory and SER Level	Mental Health Outcomes Assessed or Measured	Key/ Significant Findings	Quality Assessment
Morrell (2020)	*Study design*: Retrospective, cross sectional secondary data analysis *Methodology*: Quantitative *Sample*: Grades 6-12 (n=5,912)	*Setting:* Contiguous US/WEST, Contiguous US/EAST, RR and U, Sc *Indigenous Population:* Not specified	*Theory:* Betancourt's Integrative Model of Culture, Psychological Processes and Behavior *SER:* I, F, C, Cu	Risk and protective factors of substance use	Sensation-seeking behavior was the only significant predictor of lifetime use of all five substances measured. Overall, peer and family substance use, more favorable attitudes towards substance use, greater sensation-seeking, easier to access substances and poor school performance were associated with increased odds of substance use. Gender, religion, peer delinquent behavior, perceived maternal warmth, and school resources were inconsistently related to substance use.	GRADES: Low
Nalven (2020)	*Study design*: Retrospective, cross sectional secondary data analysis *Methodology*: Quantitative *Sample*: Grades 7-12 (n=3,498)	*Setting:* Contiguous US/WEST, Contiguous US/EAST, RR, Sc *Indigenous Population:* AI reservations across 6 US regions	*Theory:* Not specified *SER:* I, F, C	Substance use, including heroin and opioids, peer, school, and family attitudes	Colorado State's Tri-ethnic Center for Prevention Research study. Risks for opioid use included peer substance use, lower family disapproval, lower school performance. For heroin in specific, greater peer use was the only significant indicator of lifetime or past month heroin use.	GRADES: Low

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Nuño (2020)	*Study design*: Cross sectional *Methodology*: Quantitative *Sample*: Grades 11-19 (n=2,912)	*Setting*: Contiguous US/WEST, RR, Sc *Indigenous Population*: Tribal communities in Arizona	*Theory*: Social Development Theory *SER*: I, F, C	Risk and protective factors of substance use	The most powerful indicator of alcohol and drug was use age of onset. Peer and family use of substances interacted to increase risk of alcohol and drugs use in participants. However, peers with pro-social behaviors were a protective factor. Social skills, specifically the ability to resist peer pressure were protective. Religiosity was not related to alcohol use, but it was related to a decreased likelihood of drug use. Overall, a scarce number of significant protective factors were found.	GRADES: Low
Patchell (2015)	*Study design*: Quasi-experimental; pre-posttest, 8.5 weeks *Methodology*: Quantitative *Sample*: Ages 16-19 years (n=44)	*Setting*: Contiguous US/WEST, RR, Sc *Indigenous Population*: Comanche, Kiowa, Apache in Oklahoma	*Theory*: Not specified CBPR *SER*: C, Cu	Substance use, self-reliance, life problems including mental/emotional health	Native American Talking Circle Intervention incorporated tribal specific cultural beliefs into a 10-hour school-based prevention program. Self-reliance significantly increased from baseline to post intervention. Substance abuse/use showed a significant decrease from baseline to post intervention.	GRADES: High
Philip (2015)	*Study design*: Cross sectional *Methodology*: Quantitative *Sample*: Ages 12-19 years (n=50)	*Setting*: Alaska, RR, Sc *Indigenous Population*: Yup'ik	*Theory*: Not specified CBPR *SER*: F, C	Suicide, substance use, social network factors	Connection to adults and elders, but not peers, emerged as predictors of family and community level protection. Minimal effects of social network on individual level protective factors were found.	GRADES: Low

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First Author and Year	Study Design, Methodology, and Sample	Setting and Indigenous Population	Theory and SER Level	Mental Health Outcomes Assessed or Measured	Key/ Significant Findings	Quality Assessment
Rasmus (2014)	*Study design*: Semi-structured interviews in 2-3 sessions over 2 weeks *Methodology*: Qualitative *Sample*: Ages 11-18 years (n=25)	*Setting*: Alaska, RR, Sc *Indigenous Population*: Yup'ik	*Theory*: colonial stress, cultural continuity, and indigenous and community resilience CBPR *SER*: F, C, Cu	Strengths and resilience of remote indigenous youth	Two composite youth narratives about resilience were shared with the community. Findings included important connections between local stressors, community-level protective resources, and youth-driven, solution-focused strategies for overcoming hardships.	JBI: Low
Rees (2014)	*Study design*: Longitudinal; mean =230.57 days between surveys; extended consequence model for interactive effects *Methodology*: Quantitative *Sample*: High school age (n=3,426)	*Setting*: Contiguous US/WEST, Contiguous US/EAST, RR and U, Sc, H *Indigenous Population*: Not specified	*Theory*: Social Network Theory *SER*: I, C	Alcohol use school hierarchies, ethnicity differences	School social hierarchies were similar for AI adolescents and adolescents of other ethnicities, but AIs had fewer reciprocated friendships, smaller number of in-school friends, less cohesive friend groups than Caucasians. AI youth were no more likely to report their personal drinking as being detrimental to social relationships.	GRADES: Low

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First Author and Year	Study Design, Methodology, and Sample	Setting and Indigenous Population	Theory and SER Level	Mental Health Outcomes Assessed or Measured	Key/ Significant Findings	Quality Assessment
Ritchie (2014)	*Study design*: Quasi-experimental, survey with open-ended questions, 3 time points (baseline, 1 month, and 1 year post intervention) *Methodology*: Mixed methods *Sample*: Ages 12-18 years (n=73)	*Setting:* Canada, RR, Camp *Indigenous Population:* Wikwemikong Unceded Indian Reserve	*Theory:* Resilience definition by Wagnild *SER:* I	Resilience, well-being, mental, physical, and emotional factors	Outdoor adventure leadership experience. Resilience scores were significantly higher after the 10-day camp intervention compared to the control group but returned to baseline at one year. Intervening events may have contributed to the return to baseline scores.	GRADES: High JBI: Low
Ritchie (2015)	*Study design*: Critical ethnography, 10 days *Methodology*: Qualitative *Sample*: Ages 11.9-18.7 years (n=43)	*Setting:* Canada, RR, Camp *Indigenous Population:* Wikwemikong Unceded Indian Reserve	*Theory:* Medicine Wheel, Connecting to the Good Life, Resilience CBPR *SER:* I, F, C, Cu, S	Resilience, well-being guided by Indigenous ways of knowing	Outdoor adventure leadership experience. Central themes of connecting to creation and connecting to self were discovered to promote resilience and well-being. Connecting to the Good Life" and "Waking up to the Good Life" were themes that helped understand the impact of the camp.	JBI: High
Saskamoose (2016)	*Study design*: Youth sharing circles; multiple data sources including photographs, transcripts, video recordings; 3 days *Methodology*: Qualitative *Sample*: ages 14-17 years (n=13)	*Setting:* Canada, RR and U, C *Indigenous Population:* First Nations, Métis, and Inuit	*Theory:* Literature review for definitions of resilience CBPR *SER:* I, F, C, Cu, S	Resilience Neurodecolon-ization, identity	Fred Saskamoose Aboriginal Youth Leadership and Wellness Program. Themes of overcoming adversity in personal lives and communities, efforts to be healthy. Subthemes included holistic health, culture (spirituality, traditions, identity), sports and wellness, and navigating addictions.	JBI: High

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First Author and Year	Study Design, Methodology, and Sample	Setting and Indigenous Population	Theory and SER Level	Mental Health Outcomes Assessed or Measured	Key/ Significant Findings	Quality Assessment
Shadlow (2018)	*Study design*: Descriptive *Methodology*: Quantitative *Sample*: Ages 10-13 years (n=31)	*Setting:* Contiguous US/EAST, C *Indigenous Population:* AIs in Oklahoma and Kansas	*Theory:* Not specified *SER:* I	Resilience, repressive adaptive style (reporting low distress while having high distress)	Across ethnicities, differences in repressive style category did not reach statistical significance. European descent and African American children identified themselves as repressors 3x more than AI youth. Findings did not support that AI and African American children would be overrepresented in the repressor group.	GRADES: Low
Sittner (2016)	*Study design*: Longitudinal study, analysis with latent class growth model 7 waves of data collection *Methodology*: Quantitative *Sample*: Ages 10-19 years (n=646)	*Setting:* Contiguous US/WEST, RR, Sc, H *Indigenous Population:* a northern Midwest tribal nation	*Theory:* Social development model of antisocial behavior *SER:* I, F, C	Substance use, risk behaviors, aggression, and delinquency	Five aggression trajectory groups were identified: non-offenders, moderate desistors, adolescent-limited offenders, high desistors, chronic offenders. Risk factors for being a high desistor or chronic offender were parent rejection, delinquent peers, substance use and early dating. The only significant protective factor was positive school adjustment.	GRADES: Moderate
Smokowski (2014)	*Study design*: Longitudinal with two waves of self-reported data *Methodology*: Quantitative *Sample*: Middle school students from 28 public schools, ages 10-19 years Total: (n=4714), AI (n=1358)	*Setting:* Contiguous US/EAST, RR, Sc *Indigenous Population:* Lumbee AIs	*Theory:* Not specified *SER:* I	Depression, anxiety, ethnic identity, self-esteem	Self-esteem mediated the relationship between ethnic identity and anxiety/depression/externalizing behaviors for entire sample. Future optimism mediated the relationship between ethnic identity and externalizing behaviors for the entire sample and mediated ethnic identity and depressive symptoms for AIs.	GRADES: Moderate

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First Author and Year	Study Design, Methodology, and Sample	Setting and Indigenous Population	Theory and SER Level	Mental Health Outcomes Assessed or Measured	Key/ Significant Findings	Quality Assessment
Snowshoe (2017)	*Study design*: Cross sectional *Methodology*: Quantitative *Sample*: Ages 11-24 years Total: (n=290) under age 18 (n= 261)	*Setting:* Canada, RR and Urban, Sc *Indigenous Population:* First Nations, Métis, and Inuit	*Theory:* Not specified CBPR *SER:* I, C, Cu	Stressful life events, cultural connectedness	All significant relationships between mental health outcomes and the cultural connectedness scale (CCS) and subscales were in the expected direction. Age, gender and stressful events were not predictive of self-efficacy, however, when the CCS subscales were added to the model the variance of self-efficacy significantly increased. Spirituality and cultural connectedness were found to contribute to the youth's well-being.	GRADES: Low
Soto (2015)	*Study design*: Cross sectional *Methodology*: Quantitative *Sample*: Ages 13-19 years (n=969)	*Setting:* Contiguous US/WEST, RR and U, Sc *Indigenous Population:* Not specified	*Theory:* Not specified CBPR *SER:* I, Cu, S	Substance use, historical trauma, ethnic identity	Historical trauma had a positive and direct effect on smoking behaviors and historical trauma also mediated the association of cultural activities and stressful life events with past month smoking. Ethnic identity was negatively related to past month smoking.	GRADES: Low
Spillane (2020)	*Study design*: Focus groups and one-to-one interviews; modified grounded theory *Methodology*: Qualitative *Sample*: Ages 14-17 years (n=15)	*Setting:* Canada, RR, *Indigenous Population:* First Nations	*Theory:* Behavioral Theories of Choice CBPR *SER:* I, F, C, Cu	Substance use, alternatives, and access to substances	Risk factors identified were peer influences, family influences and community influences. Six protective factors were found: future goals, peer influences, family influences, community influences, alternative activities, and culture. Discrimination and stereotyping were not common themes as predicted by the authors.	JBI: Moderate

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First Author and Year	Study Design, Methodology, and Sample	Setting and Indigenous Population	Theory and SER Level	Mental Health Outcomes Assessed or Measured	Key/ Significant Findings	Quality Assessment
Spillane, Schick, Goldstein (2021)	*Study design:* Cross sectional *Methodology:* Quantitative *Sample:* Ages 11-18 (n=106)	*Setting:* Canada, RR, C *Indigenous Population:* First Nations	*Theory:* Framework of historical trauma, CBPR *SER:* I, S	Alcohol use, self-compassion	Self-compassion (the ability to be kind and accepting to oneself) was related to less alcohol use, fewer alcohol problems, and lower risk of alcohol use disorder. Self-compassion also moderated the risks of alcohol use.	GRADES: Low
Spillane, Schick, Nalven (2021)	*Study design:* Cross sectional *Methodology:* Quantitative *Sample:* Ages 11-18 (n=106)	*Setting:* Canada, RR, C *Indigenous Population:* First Nations	*Theory:* Behavior Theories of Choice *SER:* C, Cu	Cultural and social reinforcers and extracurricular activities. Alcohol and marijuana use.	Youth who rated competing life reinforcers (CLRs) as having greater value had significantly less substance use. Specifically, cultural, and social reinforcers were associated with less drinking. Extracurricular activities were associated with less drinking and less marijuana use.	GRADES: Low
Stanley (2018)	*Study design:* Adaptation of intervention, one time focus group *Methodology:* Qualitative *Sample:* Study 1: Grade 7 (mean group size= 7; two groups). Study 2: Grade 11 (n=10)	*Setting:* Contiguous US/WEST, RR, Sc *Indigenous Population:* Two Northern Plains tribal nations, one Southwest tribal nation	*Theory:* Not specified CBPR *SER:* I, F, C, Cu, S	Substance use, resilience	AI youth reported having high future aspirations, involvement in activities, and influence from family and friends. There were important differences from non-indigenous youth, including emphasis on different types of activities, a more collectivist cultural orientation, tribal identity and pride, and the importance of extended families.	JBI: Moderate

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First Author and Year	Study Design, Methodology, and Sample	Setting and Indigenous Population	Theory and SER Level	Mental Health Outcomes Assessed or Measured	Key/ Significant Findings	Quality Assessment
Swaim (2016)	*Study design*: Cross sectional *Methodology:* Quantitative *Sample*: Middle school and high school age (n=3,389)	*Setting:* Contiguous US/WEST, Contiguous US/EAST, RR, Sc *Indigenous Population:* Not specified	*Theory:* Not specified CBPR *SER:* I, F	Marijuana use, family factors	Strong effects were found for family structure, parental monitoring, family conflict, and family sanctions against marijuana use. Weaker effects were found for family participation in school events, and no relationship was found for family communication about marijuana. Findings regarding marijuana use were consistent across AI and white adolescents on reservations.	GRADES: Low
Swaim (2019)	*Study design*: Self-report survey, SEM analysis *Methodology*: Quantitative *Sample*: Grades 7-12 (N=3,375); middle school males (n=697), middle school females (n=767), high school females (n=975), high school males (n=936)	*Setting:* Contiguous US/WEST, Contiguous US/EAST, RR, Sc *Indigenous Population:* Not specified	*Theory:* Not specified *SER:* I, C	Substance use, self-esteem, cultural identification	Except for high school females, self-esteem was significantly positively related to both AI and white identification. Alcohol use was not directly related to cultural identification or self-esteem. A small mediating effect of self-esteem on marijuana use was found in high school females. No other mediating effects were found.	GRADES: Low

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First Author and Year	Study Design, Methodology, and Sample	Setting and Indigenous Population	Theory and SER Level	Mental Health Outcomes Assessed or Measured	Key/ Significant Findings	Quality Assessment
Swaim (2021)	*Study design:* Latent class analysis *Methodology:* Quantitative *Sample:* Grades 9-12 (n=2,884)	*Setting:* Contiguous US/WEST, Contiguous US/EAST, RR *Indigenous Population:* Not specified	*Theory:* Not specified *SER:* I	Substance use, risk behaviors, well-being, self-esteem	Four classes of marijuana use were identified ranging from nonusers to regular users. Predictors of use differed in females and males. For females, protective factors were living with both parents, family sanctions against use, and self-esteem. Risks were peer use and coping motive for marijuana use. For males, protective factors were parental monitoring and family sanctions against use. Risks for males were peer use.	GRADES: Low
Tingey (2014)	*Study design:* Descriptive, 1 year *Methodology:* Qualitative *Sample:* Ages 13-19 years (n=22)	*Setting:* Contiguous US/WEST, RR, C, H *Indigenous Population:* White Mountain Apache	*Theory:* White Mountain Apache Descriptive Model of Youth Suicide CBPR *SER:* I, F, C, S	Risk pathways for suicide	Four themes of suicide risk emerged including individual, family, community, and societal. Adjustments were made to the existing conceptual model and included removal of the following sub-themes: negative media messages, access to means. Added were the sub-themes of emotional dysregulation, substance use, and imitation.	JBI: High
Tingey (2016)	*Study design:* Cross-sectional, case control *Methodology:* Quantitative *Sample:* Ages 10-19 years, cases (n=66), controls (n=55)	*Setting:* Contiguous US/WEST, RR, C, H *Indigenous Population:* White Mountain Apache	*Theory:* Not specified CBPR *SER:* I, F, C, Cu	Depression, anxiety, binge alcohol use, risk behaviors	Risk factors for heavy binge drinking included aggressive or impulsive behaviors, having deviant peers, poor family functioning, more people living in the home. Protective factors were attending school, family closeness, residential stability, social problem-solving skills, traditional AI values, strong ethnic identity.	GRADES: Moderate

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Tingey (2021)	*Study design*: cross-sectional, secondary data analysis from an RCT *Methodology*: Quantitative *Sample*: Ages 11-19 (n=534)	*Setting:* Contiguous US/WEST, RR *Indigenous Population:* Southwest US tribe	*Theory:* Protection Motivation Theory CBPR *SER:* I, F, C	Co-occurring risk factors; substance use	Respecting the Circle of Life Program, an intervention shown to improve sexual health behaviors for AI/AN youth, was evaluated for the effect on substance use risk and protective factors. Youth completing the program reported lower intention to use substances through 12-month follow up. Peer and parent protective factors were improved.	GRADES: Low
Tolliver-Lynn (2020)	*Study design*: Cross sectional *Methodology*: Quantitative *Sample*: Parents (n=57) of children ages 3-5	*Setting:* Contiguous US/WEST, Contiguous US/EAST, RR and U, C *Indigenous Population:* Not specified	*Theory:* Family Resilience (Masten, 2015) *SER:* F	Risk behaviors, resilience, parental anxiety, depression, cultural identification, parent-child relationship	The quality of parent-child relationships moderated the association between parent anxiety symptoms and child internalizing symptoms. Strength of parent-child relationship buffered the effect of parent distress on child internalizing symptoms.	GRADES: Low
Tremblay (2018)	*Study design*: Photovoice with accompanying descriptions coded and analyzed for themes, 10 sessions *Methodology*: Qualitative *Sample*: Ages 15-19 years (n=11)	*Setting:* Canada, RR, Sc, H *Indigenous Population:* Maskwacis Tribal Community	*Theory:* Not specified CBPR *SER:* C, Cu	How youth view community strengths, reframing perceptions through photos	40 photos taken by 11 youth and 2 adults were analyzed to determine how youth viewed their community strengths. Themes included strong relationships, commitment to culture, beautiful natural world that is a part of Maskwacis, and ability to look to the future. 392 people who viewed the photo exhibit reported a positively changed perception of the community.	JBI: Moderate

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Tyser (2014)	*Study design*: Cross sectional *Methodology*: Quantitative *Sample*: Grades 5-12 (n=164)	*Setting:* Contiguous US/WEST, RR, Sc *Indigenous Population:* Northern Plains	*Theory:* Not specified *SER:* I, Cu	Depression, optimism, cultural identity	Results supported a model in which greater goal self-efficacy, AI cultural identity, grades, and dispositional optimism each significantly predicted fewer depressive symptoms. Grades and goal self-efficacy had both direct and indirect (through optimism) relationships with depressive symptoms.	GRADES: Low
Ulturgasheva (2014)	*Study design*: Grounded theory, multi-site comparative study *Methodology*: Qualitative *Sample*: Ages 11-19 years (n=20)	*Setting:* Alaska and Canada, RR *Indigenous Population:* Inuit, Yup'ik, Inupiaq	*Theory:* A new "sliding scale" youth resilience model CBPR *SER:* I, F, C, Cu	Resilience, vulnerability	Circumpolar indigenous pathways to adulthood study. Strategies for resilience among the Inuit: family, camping and hunting, being on the land. Yup'ik: relatives, peer support, land/river, sports, school, not thinking about things too much, helping someone else, prayer and God. Inupiaq: peers, relatives, self-reliance, emotional support networks, culture, time on land, subsistence, sense of competence, responsibilities and contributing to others.	JBI: Moderate
Unger (2020)	*Study design*: Cross sectional *Methodology*: Quantitative *Sample*: Ages 13-18 years (n=156)	*Setting:* Contiguous US/WEST, RR and U, Sc *Indigenous Population:* Unidentified tribal communities in California	*Theory:* Not specified *SER:* I, C	Substance use; ethnic identity, spirituality	Strong ethnic identity was protective against cigarette, marijuana, and alcohol use, but not protective of blunt or e-cigarette use. Spirituality was associated with increased risk of cigarette and marijuana use. Previous ceremonial tobacco use had no significant associations with past month substance use.	GRADES: Low

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Walls (2016)	*Study design*: Cross sectional, 7th wave data from an 8-year longitudinal study *Methodology*: Quantitative *Sample*: Enrolled at ages 10-12; Current mean age= 17.23 years (n=569)	*Setting:* Canada, Contiguous US/WEST, Contiguous US/EAST, RR *Indigenous Population:* Unspecified	*Theory:* Not specified CBPR *SER:* I, F, Cu, S	Resilience, spiritual activities, discrimination, historical loss	Indigenous spirituality was associated with depressive symptoms, anger, anxiety, somatization, and interpersonal difficulties, but observed effects were attenuated when historical loss and discrimination were added into statistical models. Consideration of cultural complexities changed the authors' original conclusions.	GRADES: Low
West (2021)	*Study design:* Culturally informed talking circle *Methodology:* Qualitative *Sample:* Ages 13-18 (n=83)	*Setting:* Contiguous US/WEST, RR,C *Indigenous Population:* California tribes	*Theory:* Not specified *SER:* I, F, C, Cu	Opioid use, risk behaviors, resilience	Study of AI/AN teens with opioid and other substance use disorders and their use of services. Barriers to care (risks) included shame, stigma, lack of trust. Risks for use were intergenerational substance use disorder. Protective factors included family cohesion, cultural traditions, and culturally based youth programs.	JBI: High
Wexler, Jernigan (2014)	*Study design*: Semi-structured interviews (one hour x 3), modified grounded theory analysis *Methodology*: Qualitative *Sample*: Ages 11-18 years (n=20)	*Setting:* Alaska, RR *Indigenous Population:* Inupiaq	*Theory:* Social Ecology of Resilience (Ungar, 2008, 2011) CBPR *SER:* I, F, C, Cu	Resilience, everyday struggles, and life challenges	Stressors by theme: relationship loss, "not being there for me," non-supportive/hostile experiences, transitioning to adulthood, and boredom. Resilience strategies by theme: relationships with others, being responsible, creating systems of reciprocity, subsistence living, and giving back to family and community.	JBI: Moderate

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Wexler, Joule (2014)	*Study design:* Semi-structured interviews (one hour x 3) *Methodology*: Qualitative *Sample*: Ages 11-18 years (n=20)	*Setting:* Alaska, RR *Indigenous Population:* Inupiaq	*Theory:* Social Ecology of Resilience (Ungar, 2008, 2011) CBPR *SER:* I, F, C, Cu, S	Community resilience	Cultural grounding was related to more flexible patterns of resilience in youth. Kinship networks allowed for young peoples' access to cultural and material assets. Cultural and subsistence activities were important to most youth. Historical and political positioning influences access to cultural resources	JBI: Moderate
Wexler (2016)	*Study design*: Longitudinal, quasi-experimental, pre-posttest, 9 months Focus groups, interviews *Methodology*: Mixed methods *Sample*: Grades 8-11 (n=86); paired youth leaders (n=61)	*Setting:* Alaska, RR, Sc *Indigenous Population:* Inupiaq	*Theory:* Not specified CBPR *SER:* I, C	Resilience, risk behaviors	Intervention study of Youth Leaders Program (YLP). Quantitative: increased attendance and academic performance were found in program participants. Comparing matched pairs pre- and post-survey showed no significant changes; levels of positive feelings were high before and after. Qualitative: participants felt an increased sense of agency, responsibility, and confidence.	GRADES: High JBI: High
Whitesell (2014)	*Study design*: Longitudinal growth mixture modeling, 2 years *Methodology*: Quantitative *Sample*: Grades 6-7 (n=381)	*Setting:* Contiguous US/WEST, RR, Sc *Indigenous Population:* Northern Plains	*Theory:* Not specified *SER:* I, F, C	Substance use, patterns, and predictors	Across substances risk factors were stress, early puberty, and deviant peer relationships. Protective factors were strong relationship with parents and prosocial peers. Emergent cultural identity did not relate to substance use.	GRADES: Moderate

Table A1
Characteristics of included research, summary of results, critical appraisal/quality assessment

First Author and Year	Study Design, Methodology, and Sample	Setting and Indigenous Population	Theory and SER Level	Mental Health Outcomes Assessed or Measured	Key/ Significant Findings	Quality Assessment
Yasui (2015)	*Study design*: Longitudinal, quasi-experimental, pre-posttest (baseline and 1-year post-intervention) *Methodology*: Quantitative *Sample*: Ages 11-17 (n=92)	*Setting:* Contiguous US/WEST, RR, C, H *Indigenous Population:* Three Northwest US tribal nations	*Theory:* Not specified *SER:* I, F, S	Substance use, culture, and discrimination	Parents with high cultural socialization and socialization of coping with discrimination were predictive of lower youth depression scores and higher youth-reported ethnic identity. No relationship was found between discrimination and ethnic identity.	GRADES: High
Zapolski (2017)	*Study design*: Cross sectional *Methodology*: Quantitative *Sample*: Grades 4-12 Total (n=34,708); AI (n=474)	*Setting:* Contiguous US/WEST, U, Sc, C *Indigenous Population:* not specified from a large midwestern county	*Theory:* Social Ecology of Resilience (Ungar, 2008, 2011) *SER:* I, Cu	Substance use, ethnic identity across diverse youth	Compared African Americans, whites, multiracial, Hispanic and AI youth in measures of ethnic identity, drug attitude and drug use. Unlike other ethnic groups, AI ethnic identity was not significantly related to drug attitude or drug use.	GRADES: Low

CBPR: Community-Based Participatory Research
Cu: Cultural
F: Family
H: Participant's home
HC: Health care facility
I: Individual

RR: Reservation or rural
S: Societal
Sc: School
SER: Social Ecological Conceptualization of Resilience
U: Urban