SYSTEMATIC REVIEW OF INTERVENTIONS FOCUSING ON INDIGENOUS ADOLESCENT MENTAL HEALTH AND SUBSTANCE USE

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Abstract: Mental health and substance use are pressing public health concerns among Indigenous adolescent populations. This systematic review analyzed interventions focusing on mental health and substance use that utilize the Positive Youth Development (PYD) framework, incorporate culturally tailored programs, and are geared toward Indigenous adolescents. In total, 474 articles were retrieved from PSYCInfo and PubMed databases. Eight articles were eligible for analysis, with six focusing on AI/AN populations in the U.S. Most programs reported positive or expected outcomes. All the programs incorporated PYD variables, while all but one were culturally grounded or included deep structure adaptations. Implications are further discussed.

INTRODUCTION

Approximately one in five adolescents experiences mental health concerns, most commonly exhibited as symptoms of depression and anxiety (World Health Organization [WHO], 2005). Addressing mental health concerns during adolescence is particularly important due to the influence of mental well-being on individuals' ability to become contributing members of society, with implications for future health and quality of life (Kessler et al., 2005; WHO, 2005). During adolescence, individuals develop coping mechanisms for stressful situations (Williams, Holmbeck, & Greenley, 2002). Risky behaviors such as substance use—specifically, alcohol and tobacco use—serve as ineffective coping strategies that may both impact and be influenced by mental health (Brooks, Harris, Thrall, & Woods, 2002). These findings support the need for preventive measures addressing mental health and substance use among adolescents (Ansell et al., 2008; Williams et al., 2002).

Indigenous youth, in particular, are at greater risk for mental health concerns when compared to majority groups, with elevated prevalence and incidence of substance use, suicidality, mood disorders, and anxiety disorders (Australian Bureau of Statistics, 2011; Australian Health Ministers' Advisory Council, 2012; Goodkind et al., 2010; Look, Trask-Batti, Agres, Mau, & Kaholokula,

2013; Māuri Ora Associates, 2008; Storck, Beal, Bacon, & Olsen, 2009; Zubrick et al., 2005). In the U.S., American Indian and Alaska Native (AI/AN) youth have markedly increased rates of suicide and alcohol-related deaths, which are 3.3 and 10 times greater, respectively, than aggregate national data (Indian Health Service, 2009; Storck et al., 2009). Other Indigenous youth demonstrate similar concerns, with Native Hawaiian and Pacific Islander youth being 3.75 times more likely to make a suicide attempt compared with White youth in the U.S. (Wong, Sugimoto-Matsuda, Chang, & Hishinuma, 2012). Māori youth in New Zealand have rates of suicide two to three times greater than those of non-Māori populations (Beautrais, Wells, McGee, & Oakley Browne, 2006). In Australia, Indigenous male and female youth, respectively, have rates of suicide of 43.4 and 9.9 (per 100,000) compared with 18.7 and 3.2 for non-Indigenous youth ages 15-19 years, and are at heightened risk for experiencing mental health and substance use disorders (Australian Government Department of Health, 2013). Compared to the rest of the Canadian population, First Nations and Iniut youth have increased prevalence of substance use; in addition, First Nations youth are 5 to 7 times more likely to die from suicide, and Iniut youth are 6 to 11 times more likely to die from suicide (Government of Canada, 2006). Despite increasing efforts to address behavioral and mental health concerns in Indigenous populations, disparities continue to exist (Goodkind et al., 2010).

The purpose of this paper is to conduct a systematic review of published literature about interventions that address mental health and substance use disparities of Indigenous youth in selected English-speaking countries, including AIs/ANs and Native Hawaiians in the U.S., M**ā**ori in New Zealand, Aboriginal persons in Australia, and First Nations and Aboriginal persons in Canada. This review utilizes the Positive Youth Development (PYD) framework, which is being used increasingly to prevent adolescent risk behaviors by focusing on strengths that may buffer adversity and stress (Maslow & Chung, 2013; Youngblade et al., 2007). This systematic review also analyzes interventions based on their approach of tailoring programs to demonstrate cultural competence (Okamoto, Kulis, Marsiglia, Holleran Steiker, & Dustman, 2013).

Framework Assessment

PYD

PYD is an integral theory with adaptations from the Developmental Assets and Socio-Ecological Model (Atkiss, Moyer, Desai, & Roland, 2011) that may serve as an important framework for interventions geared toward Indigenous adolescents, due to its emphasis on protective factors to enhance their ability to cope with stressors in life (Spencer & Spencer, 2014). This strengths-based approach aims to increase the capacity of youth to develop self-expression, self-efficacy, and a sense of belonging through positive assets developed in supportive contexts, which is essential for

healthy development (Ansell et al., 2008; Spencer & Spencer, 2014). The philosophy underlying the PYD framework aligns with many Indigenous values by emphasizing holistic approaches to youth development (Durie, 2011; Mau, Blanchette, Carpenter, Kamaka, & Saito, 2010). Consistent with the PYD framework that highlights the importance of supportive relationships and environments, Indigenous adolescents often develop positive life and coping skills when appropriate support is provided by their families and communities (Ansell et al., 2008; Durie, 2011; Spencer & Spencer, 2014).

Culturally Tailored Programs

Indigenous persons are diverse, and their cultural identities may be influenced by historical, relational, and contextual factors that are unique to their communities, such as recognition of the Indigenous group by the local majority group, impacts of acculturation and discrimination, exposure to violence, and access to resources (Harris, Carlson, & Poata-Smith, 2013). However, in general, Indigenous populations face many negative consequences of cultural and historical trauma, which may be transmitted intergenerationally (Sotero, 2006). Due to colonization and compulsory assimilative strategies, Indigenous populations may experience a sense of alienation, which can contribute significantly to health disparities and adverse consequences in emotional, social, and mental well-being (Brave Heart, Chase, Elkins, & Altschul, 2011; Brave Heart & DeBruyn, 1998; Gracey & King, 2009; Mayeda, Chesney-Lind, & Koo, 2001). Moreover, previous unethical research among Indigenous populations also has led to feelings of distrust toward the scientific community (Burhansstipanov, Christopher, & Schumacher, 2005). Because adolescence is a crucial developmental time period when individuals begin to explore their identity, values, and place in society (Erikson & Erikson, 1997), Indigenous adolescents, in particular, may experience feelings of dissonance in a majority culture that often marginalizes their beliefs and practices (Atkinson, Morten, & Sue, 1993).

While differences exist in cultural identities within and among Indigenous populations, culturally tailored programs are important for increasing program effectiveness and acceptance, particularly with sensitive topics such as mental health and substance use (Betancourt, Green, Carrillo, & Ananeh-Firempong, 2003; Whaley & Davis, 2007). Culturally tailored programs may demonstrate cultural competence along a continuum ranging from culturally grounded programs, programs with deep structure adaptations, programs with surface structure adaptations, to nonadapted programs (Okamoto et al., 2013). As defined by Okamoto et al., culturally grounded programs include curricula and interventions that are derived organically by community-driven efforts that place the social and cultural contexts of the targeted population at the center. Deep structure adaptations incorporate modifications to a pre-established or evidence-based program rooted in cultural contexts and constructs to enhance acceptance by targeted participants. Surface structure

adaptations include modifications to images or text in existing or previously validated curricula to increase familiarity of concepts being taught. Although each type of approach has strengths and limitations, surface structure and nonadapted programs are least desirable and often unacceptable to minority communities due to their inability to address core cultural components.

METHOD

Articles from the PSYCInfo and PubMed databases were retrieved between September 2013 and September 2014. We used these databases due to their strong emphases on peer-reviewed literature in the medical, behavioral sciences, and mental health fields. An adaptation of the PRISMA Statement (Moher, Liberati, Tatzlaff, Altman, & the PRISMA Group, 2009) was utilized to identify peer-reviewed journal articles evaluating programs designed to improve mental health and reduce substance use among Indigenous adolescents in the U.S., New Zealand, Australia, and Canada. The PRISMA Statement helps authors review literature systematically with the intent of evaluating health interventions (Moher et al., 2009).

Inclusion Criteria

We conducted seven searches with a combination of the following words, using the Boolean operating term AND between each search category: 1) intervention; 2) Native or Indigenous or Aboriginal; 3) youth or adolescent or teenager; and 4) positive youth development, mental health, emotion, anxiety or trauma, depression or suicide, stress, and cope or coping. To be included in this review, studies needed to: 1) examine an observed variable related to mental health and/or substance use; 2) have an intervention targeting Indigenous, Native, or Aboriginal youth from selected English-speaking countries between the ages of 10 and 19 years, in accordance with the WHO definition of an adolescent; 3) be written in English; 4) be published as a peer-reviewed journal article and indexed in the PsychInfo or PubMed database, with final observed variables in the intervention; and 5) be published in 2000 or later to be consistent with classifications of the various mental health conditions (i.e., depression, anxiety disorders, and substance abuse/dependence) identified in the DSM-IV-TR, which was published in 2000 (American Psychiatric Association, 2000).

The DSM-IV-TR mental health classifications correspond to the International Statistical Classification of Diseases (ICD), the international diagnostic tool for mental health and other disorders (WHO, 2015). The adapted version of the ICD-10, ICD-10-AM/ACHI/ACS, was modified for use in Australia in 1998 and in New Zealand in 1999, while the adapted version of the ICD-10, ICD-10-CA, was modified for use in Canada and introduced in 2000. Articles published prior to 2000 were excluded for this review in hopes of standardizing criterion of mental health and

substance use disorders examined by authors. There were no restrictions on study design, study duration, follow-up period, intervention strategies, or sample size. While interventions did not need to focus exclusively on Indigenous populations, results needed to have specific information relating to Indigenous populations of interest to be included in this analysis.

Framework Analysis

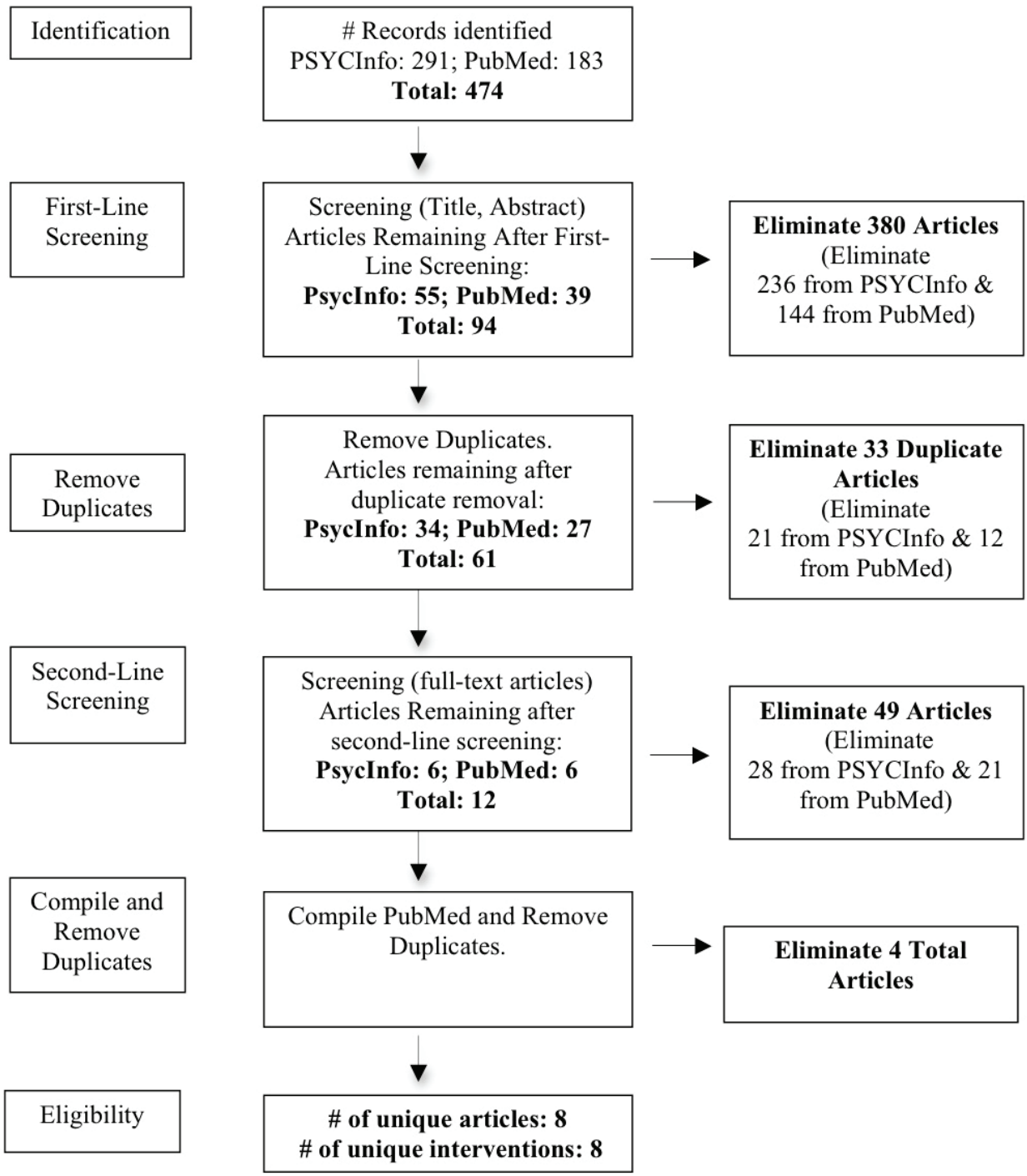
Articles included in this review were analyzed based on two different frameworks: PYD and cultural tailoring. First, based on the authors' descriptions, we analyzed interventions for their incorporation of PYD components based on 1) involvement of positive people (e.g., peers, family members, community members); 2) positive opportunities for participants to develop and apply internal assets or coping skills; or 3) availability of positive environments, generally occurring through environmental modifications during the intervention or through partnerships with the community to make changes in participants' environment (Ansell et al., 2008; Durie, 2011; Spencer & Spencer, 2014). Second, we analyzed the interventions according to the continuum of cultural tailoring provided by Okamoto et al. (2013) on a scale from 1-4, where culturally grounded programs were rated as 1, deep structure programs as 2, surface structure programs as 3, and nonadapted programs as 4.

Article Selection Process

A total of 474 articles were identified: 291 from PsycInfo and 183 from PubMed, ultimately resulting in 8 relevant articles. Figure 1 shows the screening process, with the incorporation of PRISMA guidelines. Of the 474 articles, 380 were eliminated based on title and abstract. An additional 33 duplicate articles were identified and removed, leaving a total of 61 articles (34 from PSYCInfo and 27 from PubMed) for screening according to full text. Of the 61 articles, 49 were eliminated because they did not meet the inclusion criteria of this review, leaving 12 articles. These remaining 12 articles were compiled and 4 duplicate articles were removed.

Figure 1

Selection of Articles (Adapted from Moher, Liberati, Tatzlaff, Altman, & the PRISMA Group, 2009)



RESULTS

In total, eight articles were included in the final analysis. In one of the eight articles (Mohatt, Fok, Henry, People Awakening Team, & Allen, 2014), the authors described an intervention delivered separately in two different communities based on needs and resources: the *Yupiucimta Asvairtuumallerkaa* (YA) program and the *Elluam Tungiinun* (ET) program. The ET program also was the main intervention of focus in another of the eight articles (Allen, Mohatt, Fok, & Henry, 2009). Therefore, the YA program is only described by Mohatt et al. (2014), while the ET program is described by Allen et al. (2009) and Mohatt et al. (2014).

Intervention Variables and Measures

Table 1 lists intervention variables and components. Observed variables, design, and intervention setting are described in more detail below.

Table 1
Intervention Variables and Components

Reference	Observed Variables	Design	Setting	Location	Total Sample	Participant Characteristics	Intervention Duration and Dosage
Allen, Mohatt (ET)	Risk factors of suicide and alcohol use disorder	Quasi	Comm	Alaska, U.S.	61	Yup'ik AN youth 12 to 17 years old	26 Qungasvik prevention modules over 52 total sessions
LaFromboise & Lewis	Risk factors of suicide and depression	Quasi	School Based	Zuni Pueblo, New Mexico, U.S.	128	AI youth 14 to 18 years old	2-3 times/week, 20-30 weeks (year 1). Additional booster sessions (year 3)
Listug-Lunde	Depression, Anxiety	RCT	School Based	Northern Plains, U.S.	19	AI middle school students 11 to 14 years old	15 total sessions: 13 sessions, 2/week, 7 weeks, 35-40 minutes/session. Additional 2 booster sessions within 1 month post-intervention

continued on next page

Table 1, Continued
Intervention Variables and Components

Reference	Observed Variables	Design	Setting	Location	Total Sample	Participant Characteristics	Intervention Duration and Dosage
Lowe	Substance use	Quasi[a]	School Based[b]	Oklahoma, U.S.	187	Keetoowah-Cherokee students 13 to 18 years old	10 sessions, 1/week, 10 weeks, 45 minutes/session; 3 years total duration
Mohatt (YA)	Suicide risk, alcohol use disorder	Quasi	Comm	Alaska, U.S.	53	Yup'ik AN youth 12 to 17 years old	15 prevention modules
Patten	Tobacco cessation	Pre-Exp	Comm	Western Alaska, U.S.	16	AN adolescents 12 to 17 years old	Two pilot groups: Pilot 1: 2 days, 1 night Pilot 2: 3 days, 2 nights
Ritchie	Mental health: Resilience	Mixed-Pre	Comm	Wikwemikong Indian Reserve, Northern Ontario, Canada	73	Wikwemikong youth 12 to 18 years old	10-day program during two summers
Woods & Jose	Mental health: Symptoms of depression and suicide	RCT	School Based	North Island of New Zealand	56	Māori and Pacific Islanders Year 10 students (average age 14 years)	1-year duration, 8 sessions, 90 minutes/session

[a] Quasi = quasi-experimental design, RCT = randomized control trial, Pre-exp = pre-experimental design, Mixed-Pre = Mixed-Method Pre-experimental design. [b] Comm = Community-based setting.

Observed Variables

Interventions were categorized as having outcomes relating to either mental health or substance use. Some of the interventions in this analysis addressed multiple mental health and substance use concerns. Of the eight interventions, four focused on alcohol and tobacco use, four focused on suicide prevention, three focused on depression and/or anxiety, and one focused on resilience. Two studies focused on both suicide risk and alcohol use.

Study Design

Among the eight interventions, two were tested through randomized controlled trials (RCTs), four through quasi-experimental designs, and two through pre-experimental designs. For interventions using an RCT design, participants were assigned randomly to the intervention

(treatment) or to a comparable intervention (control). Quasi-experimental studies included multiple-condition quasi-experimental designs and the multiple time series design. The pre-experimental designs were nonrandomized, uncontrolled study designs, with one of the studies assessing outcome variables using a mixed method measure to determine effectiveness.

Intervention Setting

Exactly half of the interventions incorporated a school-based setting, while the other half utilized a community-based setting. All of the school-based interventions were implemented during regular school schedules. Three of the four interventions were culturally tailored, with either deep or surface structure adaptations. Two of these school-based interventions with deep structure adaptations were renamed as a skills development class or curriculum to increase attractiveness to the targeted population (LaFromboise & Lewis, 2008; Listug-Lunde, Vogeltanz-Holm, & Collins, 2013). The fourth school-based intervention, implemented by Lowe, Liang, Riggs, and Henson (2012), was the only culturally grounded program that was compared to standard education.

Three of the four community-based interventions were implemented in rural communities with AN youth; the fourth took place in an unceded Indian Reserve in northern Ontario, Canada. These interventions included different levels of community involvement throughout the research process (Allen et al., 2009; Mohatt et al., 2014; Patten et al., 2012; Ritchie, Wabano, Russell, Enosse, & Young, 2014), and differed from the school-based interventions, as they either were culturally grounded or culturally tailored with deep structure adaptations during development and implementation stages.

Participant Characteristics and Intervention Components

Table 1 lists intervention characteristics, including location, sample size, participant characteristics, and total duration. Three of the eight interventions focused on AN adolescents between 12 and 17 years of age from rural communities. These interventions focused on substance use, with two additionally focusing on suicide prevention. Sample sizes and dosage for these interventions included, respectively, 53 youth with an intervention dosage of 15 prevention modules (Mohatt et al., 2014), 61 youth who received 26 prevention modules (Allen et al., 2009; Mohatt et al., 2014), and 16 youth who received either a 2- or 3-day tobacco cessation pilot program (Patten et al., 2013).

Three of the eight interventions focused on AI youth from the U.S., with ages ranging between 11 and 18 years. All of these interventions took place in a school-based setting. Sample sizes and dosage of these programs included, respectively, 128 AI youth who attended 2-3 weekly sessions for 20-30 weeks during the first year, with additional booster sessions during the third year

(LaFromboise & Lewis, 2008), 19 AI middle school students receiving 15 sessions lasting 35-40 minutes (Lustig-Lunde et al., 2013), and 187 Cherokee students attending 10 weekly sessions lasting approximately 45 minutes (Lowe et al., 2012).

The intervention implemented by Ritchie et al. (2014) had a sample of 73 Wikwemikong youth between 12 and 18 years of age from a Canadian reserve who participated in a 10-day outdoor program that took place during two summers. Although Woods and Jose (2011) implemented their intervention with participants of various ethnicities in eight high schools located on the North Island of New Zealand, the article included here analyzed data specific to 56 Māori and Pacific Islander students in grade 10 who participated in the school's suicide prevention program, with an intervention dosage of eight 90-minute sessions.

Framework Analysis

PYD Rating

Table 2 identifies the incorporation of variables from the PYD framework. Although none of the studies explicitly cited the PYD framework in their interventions, a thorough analysis of the articles found that variables of the PYD framework were reflected in all of the interventions. The most common PYD variable, used by all eight interventions, was the emphasis on positive interpersonal relationships with peers, family members, and/or community members. Several interventions incorporated positive role models or elders who worked with participants. Some of the articles also cited the use of talking circles to enhance rapport among peers and to discuss sensitive issues related to mental health and substance use.

Table 2
Positive Youth Development and Cultural Tailoring Framework Analysis

Reference	Positive People	Positive Opportunities	Positive Environments	Culturally Tailored Program (1-4 Scale)[a]
Allen, Mohatt (ET)	X	X		1
LaFromboise & Lewis		X	X	2
Listug-Lunde	X	X	X	2
Lowe	X	X		1
Mohatt (YA)	X	X		1
Patten	X	X	X	2
Ritchie	X		X	1
Woods & Jose	X		X	3

[a] Culturally tailored programs are based on a scale from 1-4 where 1 = culturally grounded program, 2 = deep structure program, 3 = surface structure program, and 4 = nonadapted program (adapted from Okamoto et al., 2013).

Positive opportunities for the participants to develop and apply internal assets or coping skills were included in five of the eight interventions. Most of the positive opportunities were available through culturally tailored adaptations to the program, or through the promotion of self-esteem, self-efficacy, leadership, or other protective factors. For instance, Listug-Lunde et al. (2013) cited the incorporation of cognitive-behavioral principles that were used during role-play situations to allow participants to increase their self-regulation and positive coping skills. Similarly, the intervention described by Mohatt et al. (2014) incorporated modules that encouraged participants to enhance self-efficacy while increasing their capacity for reflective assessment.

Positive environments were provided in three of the school-based interventions and two of the community-based interventions. Support from and partnerships with stakeholders enabled school-based interventions to be provided as classes, thereby allowing schools to make direct changes in participants' school environments. For example, Lustig-Lunde et al. (2013) were able to provide their life skills course as a class to increase accessibility. Community-based interventions provided safe environments to address concerns relating to mental health and substance use. To demonstrate, Patten et al. (2013) implemented a tobacco cessation program that required participants to fly in from their villages to participate as a group in a supportive environment that emphasized tobacco abstinence and focused on the goals of the intervention.

Culturally Tailored Program Rating

Table 2 also displays ratings of how each intervention was culturally tailored on a scale of 1 to 4 (Okamoto et al., 2013). Four interventions were rated as culturally grounded, including community-based programs developed by community members (i.e., planning groups, councils) with the aid of university partners. Three of the eight interventions were implemented as culturally modified versions of evidence-based programs with deep structure adaptations. These authors cited Indigenous values as the core foundation of their programs. To demonstrate, LaFromboise and Lewis (2008) incorporated Zuni core values (e.g., family, community cohesion, and precolonization traditions) in their suicide prevention program. Lustig-Lunde et al. (2013) made cultural adaptations to the Adolescent Coping with Depression course, such as changing role-play situations to be culturally relevant and incorporating discussions focusing on cultural impacts of assertiveness, eye contact, constructive criticism, and self-disclosure. Patten et al. (2013) incorporated deep structure changes to behavioral modification and social cognitive theory for tobacco cessation strategies based on feedback provided by focus groups and a teen advisory group.

Woods and Jose (2011) were the only researchers to modify an evidence-based program with surface structure adaptations. Prior to implementation, they consulted community members and professionals who provided appropriate feedback on the words, examples, and pictures that were used for the intervention materials. None of the interventions included in this analysis used a nonadapted program.

Intervention Outcomes

Main outcomes for interventions included in this analysis are shown in Table 3. In general, authors reported favorable or expected outcomes. The authors of four articles reported statistically significant results following their interventions (Listug-Lunde et al., 2013; Lowe, 2012; Ritchie et al., 2014; Woods & Jose, 2011). Authors of the remaining articles either reported positive but nonsignificant findings or did not state whether findings were statistically significant. All of the articles reported process-related measures, with two specifically reporting positive participant satisfaction. Five of the eight interventions reported participant completion rates. Four of the five programs that were either culturally grounded or had deep structure adaptations had completion rates ranging from 80-96%. One (Woods & Jose, 2011) that used surface structure adaptation had post-test completion rates of 78% for the treatment group and 64% for the control group. The ET program implemented by Mohatt et al. (2014) and Allen et al. (2009) had an average of 54% participants attending each module, while the YA program had an average of 91% participants attending each module.

Outcomes of Suicide Prevention and Substance Use Programs

Mohatt et al. (2014) implemented two interventions geared toward suicide prevention and alcohol use, with expected outcomes. For both interventions, participants reported increases in coping and life skills, an increased ability to recognize protective factors, and decreased intent to use alcohol due to community, family, and peer influences such as discouragement and disapproval.

Outcomes of Suicide Prevention Programs

The two programs that focused on suicide prevention reported favorable results. LaFromboise and Lewis (2008) found increases in coping, life skills, overall mental health, and knowledge about suicide, and decreases in participants' depressive and suicide symptomology following their intervention. Participants in the intervention implemented by Woods and Jose (2011) reported a statistically significant decrease in depressive symptoms. While the control group also reported a statistically significant decrease in depressive symptoms, the treatment group demonstrated a greater decrease. Participants in the intervention also reported general improvement in overall mental health immediately following the intervention, with increases in effective coping strategies.

Table 3
Reported Outcomes

		Self-Report Outcome Measures			Process Measures
Reference	**Outcome Variable of Interest**	**Targeted Health Symptom or Knowledge, Attitude, and Behavior**	**Coping or Life Skills**	**Satisfaction**	**Attendance, Retention, or Completion**
Allen, Mohatt (ET)	Suicide risk or alcohol use	↓ Attitudes toward using alcohol[a] ↑ Protective factors ↑ Reasons for life	↑		Average of 33/61 (54%) participants attended each module
LaFromboise & Lewis	Suicide, depression	↑ Overall mental health ↑ Knowledge (suicide)= ↓ Reported symptoms (suicide) ↓ Reported symptoms (depression)	↑		Discontinued program 2 years following promised evaluation
Listug-Lunde	Depression Anxiety	↓ Reported symptoms* (depression) 0 Reported symptoms (anxiety)		+	Treatment: 8/10 (80%) Control: 8/9 (89%) Total: 16/19 (84%)
Lowe	Substance abuse	↓ Total symptom severity* ↓ Behavior (substance abuse)*	↑		179/187 (96%)
Mohatt (YA)	Suicide risk or alcohol use	↓ Attitudes toward using alcohol ↑ Protective factors ↑ Reasons for life	↑		Average of 48/53 (91%) participants attended each module
Patten	Tobacco cessation	↑ Knowledge (tobacco) ↓ Attitudes toward using alcohol ↑ Tobacco abstinence (Pilot 2)		+	Pilot 1: 9 attended of 9 enrolled Pilot 2: 7 attended of 12 enrolled Total: 16 attended of 21 enrolled (76%)
Ritchie	Resilience	↑ Reported short-term resilience* ↑ Overall mental health			Completion of program: 70/73 (96%)
Woods & Jose	Overall mental health Depression	↑ Overall mental health ↓ Depressive symptoms*	↑		**Treatment Group** Pretest: 23 Posttest: 18 (78%) Follow up: 20 (87%) 1 year: 16 (70%) **Control Group** Pretest: 33 Posttest: 21 (64%) Follow-up: 30 (91%) 1 year: 16 (48%)

[a] ↑ = increases, 0 = no change, ↓ = decreases in the measured outcome. + = positive. * = statistically significant findings for the outcome.

Outcomes of Substance Use Programs

The two programs that focused on substance use reported promising results. Compared with the control group, Lowe et al.'s (2012) intervention group reported a statistically significant decrease in symptoms of substance use and increase in life skills. Participants attending the tobacco cessation pilot program implemented by Patten et al. (2013) reported an increase in confidence to share information about tobacco cessation with family members and peers after participating in the workshop, and reported wanting to decrease tobacco use. At the 6-week follow-up, 86% and 71% of participants who attended the second pilot program reported tobacco abstinence during the last 7 or 30 days, respectively.

Outcomes of Broad-scale Mental Health Interventions

Listug-Lunde et al. (2013) found that their intervention group reported a greater statistically significant decrease in depressive symptoms, with no difference in anxiety symptoms, when compared to the control group receiving treatment as usual. Ritchie et al. (2014) found a statistically significant increase in short-term resilience immediately following their 10-day outdoor adventure leadership experience intervention.

DISCUSSION

In this paper, we examined interventions geared toward Indigenous youth and described peer-reviewed journal articles with outcome variables related to mental health and substance use. The authors intended to review interventions geared toward AI/AN and Native Hawaiians from the U.S., Māori from New Zealand, and Aboriginal youth from Australia and Canada, with the hope of examining commonalities and differences based on the PYD framework and ability to culturally tailor programs. Despite expansive search criteria, the only populations represented in this analysis through the eight retrieved articles were AIs and ANs from the U.S., Māori from New Zealand, and First Nations youth from Canada. This finding suggests the need for additional research in mental health and substance use interventions with Indigenous youth. The limited number of studies demonstrates a need for more initiatives to address mental health concerns through the evaluation of health promotion programs. Although interventions may be taking place in Indigenous communities, it is possible that these programs are not being evaluated or the findings are not being disseminated to an academic audience through publications in peer-reviewed journals. In addition, the paucity of interventions may reflect different priorities in health policies or government funding that may not prioritize mental health and substance use among Indigenous youth (LaFromboise & Lewis, 2008).

In general, interventions included in this review had positive or expected outcomes relating to mental health and substance use. Further, all of the interventions included in this analysis were culturally grounded programs or were culturally tailored as deep or surface structure programs. Authors examining interventions implemented in different communities (Allen et al., 2009, and Mohatt et al., 2014) or during different time periods (Patten et al., 2012) found more favorable outcomes for participants receiving increased dosages of culturally competent interventions. Program dosage was guided by the community's ability to implement the program based on available resources, and by participants' desire to have a longer program.

While the literature is still limited, this review demonstrates efforts being made to enhance cultural competence through culturally tailored programs. These findings may demonstrate increased desire of minority communities and like-minded researchers to address persistent health disparities through increased scholarship on community engagement and culturally competent health programs. During this process, health promotion programs may be adapted in an effort to reestablish rapport between academic researchers and Indigenous communities, which may help researchers acknowledge previous unethical research and remediate the resulting suspicion toward researchers and scientific paradigms, and, therefore, increase cultural competence, aid in implementing programs that are ethical, redistribute power between researchers and participants, empower Indigenous communities, and build sustainability to address identified health concerns (Walters et al., 2008). These findings also suggest researchers are acknowledging the need to address mental health disparities by incorporating strength-based approaches that align with the beliefs, perceptions, and social contexts of Indigenous populations (Wexler & Gone, 2012).

Although not explicitly stated, all of the interventions in this review focused on variables that aligned with the PYD framework. Researchers often integrated PYD variables that allowed interventions to be culturally tailored to the target population, most commonly through the enhancement of interpersonal relationships (e.g., with elders in the community). Elders are seen as an important source of wisdom and often serve as role models in many Indigenous communities (Iokepa-Guerrero et al., 2011). Similarly, role-play activities that enhanced positive coping skills and self-regulatory behaviors often were adapted based on the participants' cultural context. Thus, future researchers who wish to utilize culturally tailored approaches could consider similar ways of incorporating the PYD framework into the process.

Limitations and Future Directions

Although the culturally tailored interventions in this review demonstrate positive or expected outcomes, the findings should be interpreted with caution because they are not generalizable to other Indigenous populations, including other AI/AN youth, Māori youth, and First Nations youth

in Canada. Differences exist in Indigenous cultural identities as a result of relational and contextual factors (Harris et al., 2013), which may impact the prevention strategies used in culturally tailored interventions that address mental health and substance use concerns of Indigenous youth. For example, Mohatt et al. (2014) described the incorporation of different modules to address protective factors for AN youth, due to differences in their communities, members, and feedback given by the community during the curriculum development phase.

Despite this limitation, the process of analyzing components of interventions found to be effective in reducing mental health and substance use concerns may help future researchers to identify key cultural components pertinent to interventions with other Indigenous adolescents. For instance, talking circles or similar approaches to address mental health concerns may be replicated to determine their effectiveness and generalizability. As the number of studies on interventions with Indigenous adolescents increases, future reviews also should analyze the findings with disaggregated samples to account for the diverse contexts and lived experiences of Indigenous communities worldwide.

The interventions in this review also were limited to those described in peer-reviewed journal articles found in the PSYCInfo and PubMed databases dependent on specified search terms. Thus, future systematic reviews should build on this review by including other relevant search terms and sources of data. Future systematic reviews also should consider extending the analysis to the gray literature, to evaluate interventions that are described in sources that are easily accessible and available to nonacademic audiences and that complement peer-reviewed, indexed journal articles.

Conclusion

This systematic review is the first to analyze interventions specific to Indigenous adolescent populations with a focus on mental health and substance use outcomes. The review focused extensively on eight unique interventions described in peer-reviewed journal articles, which were analyzed based on their incorporation of the PYD framework and cultural tailoring approaches. Incorporating PYD variables and cultural tailoring into youth-focused interventions may enhance the development and health outcomes of Indigenous adolescents. The emphasis on protective factors in a culturally relevant context may reduce mental health disparities and substance use behaviors among adolescents, which will enhance the overall well-being of future generations of Indigenous populations.

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