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Identifying Protective Factors to Promote Health in American Indian and Alaska Native Adolescents: A Literature Review

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Abstract

Exposure to protective factors, conditions that protect against the occurrence of an undesirable outcome or promote the occurrence of a desirable outcome within an adolescent's environment, can foster healthy adolescent behaviors and reduce adult morbidity and mortality. Yet, little is known about the nature and effect of protective factors on the positive social and health outcomes among American Indian and Alaska Native (AIAN) adolescents. We conducted a review of the literature to identify the protective factors associated with positive health outcomes among AIAN adolescents. We consulted Elsevier Science Direct, ERIC EBSCOhost, PubMed, and the Web of Science databases. A total of 3,421 articles were encountered. Publications that did not focus on AIAN adolescents (n=3,341), did not identify protective factors (n=56), were not original research studies (n=8) or written in the English language were excluded. We identified nine categories of protective factors positively associated with health and social outcomes, including: current and/or future aspirations, personal wellness, positive self-image, self-efficacy, non-familial connectedness, family connectedness, positive opportunities, positive social norms, and cultural connectedness. Such factors positively influenced adolescent alcohol, tobacco, and substance use; delinquent and violent behavior; emotional health including depression, suicide attempt; resilience; and academic success. Protective factors spanned multiple domains of the socio-ecological model. Strengths-based health promotion efforts that leverage local, innate protective factors and work with AIANs to create environments rich in protective factors are key to improving the health and wellbeing of AIAN adolescents.

Conflict of Interest

The authors have no conflicts of interest to report. This research did not involve human subjects or animals.

Keywords

American Indian; Alaska Native; Adolescent; Protective Factors; Asset-based

Introduction

Many of the leading causes of morbidity and mortality in American Indian and Alaska Native (AIAN) adults can be traced back to adolescent behaviors (CDC, 2015a; Lowe, Riggs, Henson, & Leihr, 2009), which indicates that adolescent behaviors are an important factor that should be a focus for improving AIAN health overall. Adolescent health behaviors are influenced by many co-occurring factors within the environment. Cummins et al. (1999) concluded that the negative environmental forces to which AIAN adolescents may be exposed to in their homes, schools, or community often predispose them to adverse health and social outcomes. However, not all AIAN adolescents engage in high-risk behaviors. The aim of this review of peer-reviewed literature is to identify the protective factors that are associated with healthy behaviors or positive health outcomes among AIAN adolescents. Understanding the determinants of health and identifying modifiable factors that support positive health choices during adolescence can inform interventions designed to improve AIAN adolescent health (Borowsky, Resnick, Ireland, & Blum, 1999; Whitesell et al., 2014).

Protective factors are conditions or variables capable of directly affecting adolescents and increasing the likelihood of positive health outcomes (Hawkins, Cummins, & Marlatt, 2004; Jessor, Turbin, & Costa et al., 1998). Multiple protective factors can foster healthy behaviors even when risk factors and adversity are present (Borowsky et al., 1999; Cummins et al., 1999; Hawkins et al., 2004; Jessor et al., 1998; LaFromboise, Hoyt, Oliver, & Whitbeck et al., 2006). Identifying protective factors at the individual, relationship, and community levels of the socio-ecological framework for prevention (CDC, 2015a), and recognizing ways to leverage these factors, are foundational to promoting AIAN adolescent and subsequent adult health (Cummins et al., 1999; LaFromboise et al., 2006; Mmari, Blum, & Teufel-Shone, 2010). We conducted a review of the literature to identify the protective factors associated with positive health outcomes among AIAN adolescents.

Methods

We conducted a search of the academic literature to identify factors within the socio-ecological domains of individual, relationship, and community levels associated with positive health outcomes among AIAN adolescents. We defined protective factors as any condition or variable that protects against the occurrence of an undesirable outcome (e.g., substance use), or promotes the occurrence a desirable outcome (e.g., academic success; Hawkins et al., 2004; Jessor et al., 1998). In our search we consulted Elsevier Science Direct, ERIC EBSCOhost, PubMed, and the Web of Science databases. Exact search terms used for each database included “American Indian,” “Alaska Native,” “adolescent,” “protective factors,” “protective mechanisms,” and “supportive factors.” We found that various age ranges were used to describe the adolescent life-stage as no standard age definition currently exists (AAP, 2003; APA, 2002; WHO 2015). Consequently, we defined

adolescence as 10 to 21 years of age to be as inclusive as possible. Our search considered English-language articles published between January 1, 1970, and January 1, 2015.

A total of 16 quantitative and two qualitative studies are included in this review. Among the quantitative studies, we reviewed the protective factors identified by the study authors that were significantly associated with the outcome of interest. Among the qualitative studies, we reviewed the protective factors found to be salient to the study by the authors who conducted the analyses.

Results

We found a total of 3,421 articles (Figure 1). We excluded publications that did not focus on AIAN adolescents (n=3,341), did not identify protective factors (n=56), or were not original research studies (n=8). A total of 16 publications met the search criteria during the initial review; two of which (Allen et al., 2006; Mmari et al., 2010) were qualitative studies involving AIAN adolescents and adults. In the work done by Allen et al. (2006), Alaska Native (AN) adults were interviewed to retrospectively identify the protective factors they experienced as adolescents. In the study conducted by Mmari et al. (2010), focus groups were conducted with American Indian (AI) adolescents and adults to identify protective factors affecting AI adolescents. Upon detailed review of the selected articles, we found two additional publications meeting search criteria in one article's bibliography (Cummins et al., 1999; Pu et al., 2013) and included them in this review. A total of 18 studies were reviewed. The selected research publications are predominately cross-sectional in design using self-administered close-ended survey methodology. Four studies (Barney, 2001; Borowsky et al., 1999; Cummins et al., 1999; Pharris, Resnick, & Blum, 1997) used data sets from the National American Indian Adolescent Health Survey from various years. Three studies (Bearinger et al., 2010, 2005; Pettingell et al., 2008) used data sets from the Urban Indian Health Survey for the years 1995–1998. Two publications by the same authors (Bearinger, Pettingell, Resnick, & Potthoff, 2010; Bearinger et al., 2005) were reviewed as one publication as both studies drew on the same study population assessing similar health outcomes (i.e., violence and weapon-carrying).

Table 1 provides an overview of the studies included in this review and lists the protective factors that are identified as either statistically significant (quantitative studies) or salient to study authors (qualitative studies) as identified in the *Identified Protective Factors* column. Table 1 is organized by the health and social outcome of interest for the particular study in order to display the identified protective factors from the literature that are found to have an association with that health/social outcome.

We used inductive content analysis to identify recurring themes among the identified protective factors, and then developed a thematic categorization system (Patton, 2002); in this case, themes identified in three or more publications are determined to be recurring. Based on these recurring themes and through a process of consensus (Guba, 1978), we developed a codebook to organize and define the thematic categories (Table 2). Thematic categories for protective factors included: current and future aspirations, personal wellness, positive self-image, self-efficacy, non-familial connectedness, family connectedness, positive

opportunities, positive social norms, and cultural connectedness. Protective factors are categorized across the domains of individual, relationship, and community. Because cultural connectedness is identified as a protective factor in several socio-ecological domains, cultural connectedness is listed as a multi-level protective factor. Information regarding the study sample size and, in some cases, the definition of the study's term(s), is included the first time a study appears in the results section.

Individual Protective Factors

Individual level protective factors include characteristics an adolescent personally possesses, including personal history and biological characteristics (CDC, 2015b). The protective factors identified on the individual level include current and/or future aspirations, personal wellness, positive self-image, and self-efficacy.

Current and/or Future Aspirations—Four studies identified possessing current or future aspirations as a protective factor. Osilla et al. (2007) found *college aspirations* to be the most influential protective factor against tobacco use in a sample of 112 AIAN adolescents. Through qualitative focus groups and interviews with 172 AIs, Mmari et al. (2010) identified *motivation to succeed in life* as a protective factor against delinquency and violent behavior. Allen et al. (2006) interviewed 51 AN adults who had been lifetime abstainers, non-problem drinkers, or sober for the last five years and found *wanting to be a role model* and *having awareness of life goals* to be protective against alcohol use and abuse. In a sample of 1,157 AIAN adolescents who had self-reported past sexual abuse, Pharris et al. (1997) identified *positive feelings about school* to be protective against suicide attempt in male and female adolescents, and protective against suicide ideation and hopelessness in female adolescents. Pharris et al. (1997) also identified *doing well in school* to be protective against suicide attempt in male adolescents and suicide ideation in both male and female adolescents.

Personal Wellness—Three studies identified adolescent personal wellness as a protective factor. From a sample of 503 AIAN adolescents, Mackin et al. (2012) identified *[eating] breakfast seven out [of] past seven days* and self-identifying as being in *very good or excellent physical health* as protective factors against suicide attempt. Borowsky et al. (1999) identified *emotional health*, defined as an adolescent's emotional state (feelings of control, satisfaction, rest, emotional security, relaxation, and cheerfulness) in the last month as a protective factor against suicide attempt in a sample of 11,666 AIAN adolescents. Likewise, in a sample of 569 AI adolescents, Pettingell et al. (2008) identified *positive mood* as protective against suicide attempt.

Positive Self-Image—Three studies identified positive self-image as a protective factor for AIAN adolescents. Allen et al. (2006) identified *believing in one's value and potential* as a protective factor against alcohol use and abuse. From a sample of 13,454 AIAN adolescents, Cummins et al. (1999) identified *body pride* in male and female adolescents and *identification of personal area of skill* in male adolescents as associated with emotional health. Whitbeck et al. (2001) found *high self-esteem* to be a contributing factor to school success in a sample of 196 AI adolescents.

Self-Efficacy—Three studies identified self-efficacy as a protective factor for AIAN adolescents. Mackin et al. (2012) identified *feeling able to handle problems* as a protective factor against suicide attempt. In a sample of 630 AI adolescents, Pu et al. (2013), found *self-efficacy*, defined as feeling able to avoid violence, to be protective against violent behavior. Lastly, Allen et al. (2006) found *self-efficacy* to be protective against alcohol use.

Relationship Protective Factors

Protective factors on the relationship level include the influential relationships an adolescent has with others including family members, peers, and non-familial adults (CDC, 2015b). The protective factors identified on the relationship level include non-familial connectedness and family connectedness.

Non-Familial Connectedness—Seven studies identified connectedness with others who are not family members to be a protective factor for AIAN adolescents. Pharris et al. (1997) found that *[non-familial] adults caring*, including school officials, religious leaders, and tribal leaders, were a protective factor against hopelessness in female adolescents and a protective factor against suicide ideation in male and female adolescents who self-reported past sexual abuse. Similarly, from a sample of 2,034 AI adolescents, Barney (2001) found *feeling cared about by [non-familial] adults*, including school staff, church leaders, and tribal leaders, to be protective against depression. From a sample of 212 AI adolescents, LaFromboise et al. (2006) identified *community support* as a factor contributing to adolescent ability to cope with adversity, or resilience, as defined by the study authors. LaFromboise et al. (2006) measured community support by asking adolescents to rate how concerned community members were about youth with regard to doing well in school, being good at sports, and learning their American Indian language and customs. Borowsky et al. (1999) identified *discussing problems with friends* as protective against suicide attempt. Mmari et al. (2010) found *mentors* within schools to be protective against adolescent delinquency. Likewise, from a sample of 577 AI adolescents, Bearinger et al. (2010, 2005) identified *school connectedness*, defined as an adolescent's feeling cared about by school staff and that their school attendance was valued, to be protective against violent behavior and weapon carrying. In a sample of 381 AI adolescents, Whitesell et al. (2014) found *prosocial peer influence*, defined by researchers as the number of friends an adolescent possessed who volunteered, regularly attended sweats/ceremonies or church, thought schoolwork to be very important, and planned to go to college, to be protective against adolescent substance use.

Family Connectedness—Eleven studies identified family connectedness as being a protective factor for AIAN adolescents. Allen et al. (2006) found *close relationships with parents, parents providing guidance*, and *parents' expression of praise, affection and specialness of the child* to be protective against adolescent alcohol use. Borowsky et al. (1999) identified *discussing problems with family* and *family connectedness* as protective against suicide attempt. Pharris et al. (1997) identified *family caring* to be protective against suicide attempt in male adolescents and against suicide ideation in female adolescents who self-reported past sexual abuse. Pharris et al. (1997) also identified *attention from family* as a protective factor against suicide attempt in female adolescents, suicide ideation in male

and female adolescents, and feelings of hopelessness female adolescents who self-reported past sexual abuse, and identified *parent caring* as a protective factor against suicide attempts and suicide ideation in female adolescents who self-reported past sexual abuse. Similarly, Barney (2001) identified *feeling cared about by family* as protective against adolescent depression. LaFromboise et al. (2006) and Whitbeck (2001) explored the influence of *maternal warmth*, defined in both studies as the degree to which mother expresses caring and spends time with the adolescent. Maternal warmth fostered resilience (LaFromboise et al., 2006) and academic success (Whitbeck et al., 2001) in AI adolescents. Whitesell et al. (2014) found that *parent-child relationships* are a protective factor for substance use as assessed by the researchers through four measurements (maternal warmth, paternal warmth, parent-child communication, and shared activities). Pu et al. (2013) identified *perceived parental monitoring* to be a protective factor against adolescent violent behavior. Likewise, Mmari et al. (2010) found *parental support* protective against adolescent delinquency. Cummins et al. (1999) identified the most powerful protective factor associated with adolescent mental health to be *perceived family caring*. From a sample of 401 AIAN adolescents, Yu and Stiffman (2010) identified *positive family relationships* to be protective against adolescent substance abuse/dependence.

Community Protective Factors

Protective factors on the community level include the conditions and variables present in the settings an adolescent spends time including his or her school and neighborhood (CDC, 2015b). The protective factors identified on the community level include positive opportunities and positive social norms.

Positive Opportunities—Four studies identified the availability of positive opportunities as a protective factor for AIAN adolescents. From a sample of 5,701 AIAN adolescents, Moilanen et al. (2014) identified the *availability of extra-curricular activities* to be a protective factor against substance use. Whitbeck et al. (2001) found *participation in a sports team* and *participation in clubs* to be contributing factors for academic success, while Osilla et al. (2007) found *participation in a sports team* and *participation in music* to be protective against tobacco use. Allen et al. (2006) identified opportunities that allowed adolescents to *contribute to the community* as protective against alcohol use and abuse.

Positive Social Norms—Three studies identified the presence of positive role models as a protective factor for AIAN adolescents. Pettingell et al. (2008) found *parent prosocial behavior norms*, defined as an adolescents' perception of their parents' approval or disapproval of antisocial behavior, to be protective against suicide attempts. Allen et al. (2006) identified *positive adult role models* and *modeling of sobriety* to be protective against alcohol use and abuse. Bearinger et al. (2010, 2005) identified both *peer prosocial behavior norms*, defined as an adolescent's perception of their peers' approval or disapproval of antisocial behavior, and *parent prosocial behavior norms*, defined as an adolescent's perception of their parents' disapproval of antisocial behavior, to be protective against violent behavior and weapon carrying.

Multi-Level Protective Factors

Cultural connectedness appeared as a protective factor at the individual (LaFromboise et al., 2006, Pu et al., 2013; Whitbeck et al., 2001), relationship (Allen et al., 2006), and community levels (Mmari et al., 2010; Pharris el al., 1997).

Cultural Connectedness—Six studies identified cultural connectedness as a protective factor. LaFromboise et al. (2006) and Whitbeck et al. (2001) defined enculturation as composed of three components: *involvement in traditional activities*, *identification with American Indian culture*, and *involvement and importance of traditional spirituality*. On the individual level, LaFromboise et al. (2006) found *enculturation* to be the most influential protective factor in fostering resilience in AIAN adolescents. Similarly, Whitbeck et al. (2001) identified enculturation to be correlated with academic success. Pu et al. (2013) documented that those adolescents who had an *interest in [their] tribe's culture* to be less likely to display violent behavior. On a relationship level, Allen et al. (2006) found the *transmission of cultural expectations and values* and the cultural concept of *"interconnectedness"* to be protective against adolescent alcohol abuse. On a community level, Mmari et al. (2010) identified both *tribal language* and an adolescent's *involvement in ceremonies and pow wows* as protective against delinquent behaviors. Pharris et al. (1997) identified *involvement with traditional activities* to be protective against suicide attempt in male adolescents who reported past sexual abuse.

Discussion

We found a growing body of evidence demonstrating several protective factors associated with positive health and social outcomes of AIAN adolescents. We identified nine major categories of protective factors spanning individual, relationship, community, and multi-level domains. Given these findings, utilizing and enhancing protective factors at multiple levels could guide strength-based health promotion and prevention programing for adolescent AIANs. Interventions that enhance protective factors have the potential to be especially beneficial; when protective factors are strengthened, their positive health effects reach beyond the intervention's target population to affect an entire community (Mackin et al., 2012). Additionally, the additive effects of multiple protective factors argue for leveraging several protective factors simultaneously (LaFromboise et al., 2006).

To our knowledge, this review of protective factors across multiple health outcomes among AIAN adolescents has not been conducted previously. Including both qualitative and quantitative studies is also unique and a strength of this review. We recommend the following for future health interventions with AIAN youth: 1) identify and utilize innate, local protective factors present within an AIAN community to promote adolescent health; and 2) focus on creating environments that are rich in protective factors across the domains of the social-ecological model.

Identify and leverage innate, local protective factors present within AIAN communities

A strengths-based approach to health promotion recognizes that a community possesses resources and capabilities as well as health concerns in need of attention (Jain & Cohen,

2013; Sabalauskas, Ortolani, & McCall, 2014). Providers in the child welfare and behavioral health fields have begun to utilize approaches that identify personal and community strengths and incorporate them as part of the process of improvement (Sabalauskas et al., 2014). Public health can utilize a strength-based approach by identifying the protective factors present within AIAN communities and integrating those factors into program design (Jain & Cohen, 2013). Table 3 displays examples from this literature review of protective factors and their observed positive effects across multiple health and social outcomes. A specific example of this practice in action can be seen in the *The People Awakening Project* (Allen, Mohatt, Fok, Henry, & People Awakening Team, 2009; Allen et al., 2006; Mohatt, Fok, Burket, Henry, & Allen, 2011). This project conducted qualitative interviews with 51 AN adults who had been lifetime abstainers, non-problem drinkers, or sober for the last five years in order to identify factors that led to their sobriety or recovery (Allen et al., 2009; Allen et al., 2006). These factors were then used to develop prevention programs for AN adolescents (Allen et al., 2009; Allen et al., 2006).

Focus on creating environments rich in protective factors across the domains of the social-ecological model

Our research is consistent with emerging literature that suggests “success, health, and prevention of problems often depend on the strengths that an individual possesses internally or can find in his or her family or environment” (Stiffman et al., 2007, p. 331). While health-promotion professionals can enhance existing interventions by locating protective factors within all areas of an adolescent’s life, a deeper understanding of the local definitions of complexities of social domains is required (Mackin et al., 2012). For example, family and extended family support is an important and powerful protective factor for AIAN adolescents (Allen et al., 2006; Barney, 2001; Borowsky et al., 1999; Cummins et al., 1999; LaFromboise et al., 2006; Mmari et al., 2010; Pharris et al., 1997; Pu et al., 2013; Whitbeck et al., 2001; Whitesell et al., 2014; Yu & Stiffman, 2010). In leveraging familial protective factors, intervention designs must recognize that AIAN definitions of family and kinship may differ from Euro-American definitions and family structures may look different from one AIAN community to the next (Whitbeck et al., 2001). Community-level protective factors, such as positive social norms and positive opportunities, also were found to improve the odds of health promoting behaviors among adolescents (Allen et al., 2006; Bearinger et al., 2010, 2005; Moilanen et al., 2014; Osilla et al., 2007; Pettingell et al., 2008; Pharris et al., 1997; Whitesell et al. 2014; Whitbeck et al., 2001). Public health practitioners and AIAN community members should partner to identify and enhance existing protective factors and create environments rich in protective factors. Through such collaborative partnerships in research and intervention design, local definitions of protective factors can be discovered and leveraged (Allen et al., 2009; Allen et al., 2006; Teufel-Shone et al., 2014). Additionally, given the importance of cultural protective factors to AIAN adolescent health (Allen et al., 2006; LaFromboise et al., 2006; Mmari et al., 2010; Pharris et al., 1997; Pu et al., 2013; Whitbeck et al., 2001), the need to support and invest in AIAN culture preservation and revitalization efforts are critical to ensure AIAN adolescents have access to uniquely tailored protective factors only their cultures can provide.

Study Limitations

This literature review focused only on the protective factors found to have a statistically significant association with the health and/or social outcome of interest or those that were discussed as protective within the two qualitative studies reviewed. Therefore, we may have under-represented the array of protective factors potentially associated with AIAN adolescent health. While we made efforts to thoroughly search the available literature regarding protective factors affecting AIAN adolescents, publications may have been missed. As suggested by Mackin et al. (2012), additional protective factors likely exist but have not been measured in the research studies reviewed here.

Additionally, not all the quantitative studies included in this review reported the statistical values of the results for the protective factors that are identified by the researchers to be statistically significant. In such cases, we included the protective factors as identified by the original study author in good faith.

Recommendations for Future Research

Protective factors influence positive health and social outcomes of AIAN adolescents. Even when exposed to trauma or high-risk environments, protective factors provide sources of support and motivation for adolescents (Allen et al., 2006; Borowsky et al., 1999; Cummins et al., 1999; LaFromboise et al., 2006). Continued research in this area is paramount, as is the creation of better tools for identifying and measuring cultural protective factors and incorporating AIANs' views of their own assets, protective factors, and desirable health outcomes. Research should also address the rapid development and behavioral and cognitive differences across the continuum of adolescent age range (AAP, 2003; APA, 2002); considering the distinct social influences on younger and older adolescents would enhance future exploration of adolescent assets and protective factors.

Create tools to better identify and measure culturally centered protective factors

Cultural protective factors are identified across multiple domains of the social-ecological model. As Pavkov, Travis, Fox, and Bear King (2010) state, "traditional (AIAN) culture, when allowed to flower, provides an informal, flexible, strength-based, prevention oriented system with long-standing traditions" (p. 132). However, many researchers have noted the challenging nature of identifying and measuring culture and cultural protective factors (Allen et al., 2006; LaFromboise et al., 2006; Mohatt et al., 2011; Whitbeck et al., 2001; Whitesell et al., 2014). Culture is complex and difficult to measure using standard, one-dimensional measurement tools (Whitbeck et al., 2001). Currently, social science lacks culturally congruent measurement tools to identify and measure protective factors and positive outcomes within the AIAN population (LaFromboise et al., 2006; Whitbeck et al., 2001). As a result researchers may use tools to measure cultural factors that are not relevant to a particular AIAN population (LaFromboise et al., 2006; Whitbeck et al., 2001). Measuring cultural protective factors within the adolescent population can be particularly problematic as adolescents may be in the initial stages of forming a cultural identity (Whitesell et al., 2014).

Create opportunity for AIANs to identify protective factors and desirable health outcomes

Many of studies reviewed here are cross sectional and quantitative in design and used standardized questionnaires with predetermined variables or measurement scales. Qualitative research methods where participants identified *any* adolescent protective factors they felt were relevant and effective were only applied in two of the studies reviewed (Allen et al., 2006; Mmari et al., 2010). In only a few cases did the research team engage AIAN community members to adapt or create standardized instruments (LaFromboise et al., 2006; Whitbeck et al., 2001; Yu & Stiffman, 2010). Future research studies should engage AIANs in order for them to self-identify the protective factors for themselves and their communities (Allen et al., 2006; Stiffman et al., 2007). In using this approach, the protective factors identified will be contextually and culturally appropriate to the target population and better suited for guiding intervention efforts as compared to protective factors identified by academic researchers alone (Allen et al., 2006). Additionally, future intervention goals should align with local AIAN community definitions of wellness and health (Mohatt et al., 2011; Whitbeck et al., 2001).

Conclusion

Protective factors, located throughout the domains of the social-ecological model, are associated with a breadth of positive health and social outcomes in AIAN adolescents. Identifying and utilizing local, innate protective factors in health promotion ensures such efforts will be relevant and culturally congruent to the target population. Leveraging local protective factors also promotes an asset-based approach rather than focusing on deficits alone. Formative research with AIAN adults and adolescents is needed to identify protective factors that may exist but are not currently being measured with existing standardized instruments. AIANs should be integrally involved in identifying protective factors as a means towards reducing health disparities within the AIAN population.

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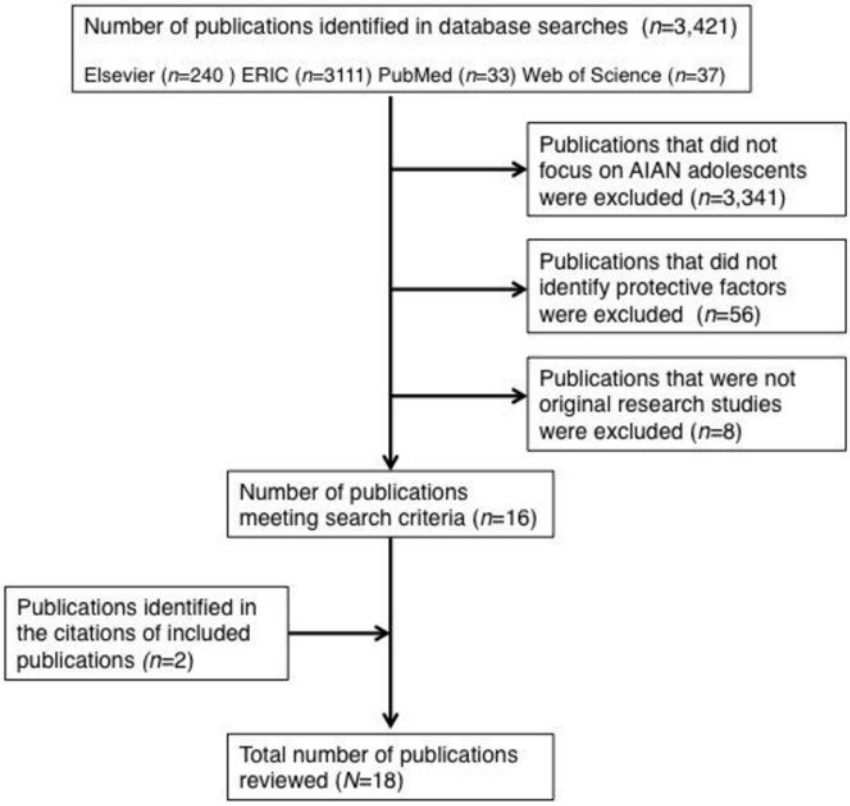

Figure 1.
Number of Publications Identified and Selected

Table 1

Protective Factors found to be significantly associated with positive health and social outcomes among AIAN adolescents aged 10–21 years (1997–2015)

Health/Social Outcome	Publication	Study Population	Study Methodology	Instrument	Identified Protective Factors
Academic Success	Whitbeck et al. (2001)	196 AI students, ages 10 to 15 (mean age=12.1–12.2) living on or near three reservations in the upper Midwest	Cross-sectional Adolescents completed structured, closed-ended surveys	*Self-esteem* was assessed using the Tri-Ethnic Center's self- esteem scale. *Maternal warmth* was measured using a scale adapted from the Iowa Youth and Families Project. *Enculturation* was measured using the AI cultural identification items (Oetting & Beauvais, 1991) and questions developed by the researchers and local advisory board. Other close-ended questions were developed by the researchers to measure *participation in sports or clubs*.	– Protective factors associated with school success were: high self-esteem, maternal warmth, enculturation, participation in sports or clubs after school
Alcohol Abuse	Allen et al. (2006)	51 AN adults who had been lifetime abstainers, non-problem drinkers, or sober for the last five years, ages 19 to 83 (mean age = 49), from rural Alaska villages	Qualitative Researchers interviewed participants using a standard set of questions to identify retrospectively protective factors linked to their non-use or non-abuse of alcohol as adolescents	Semi structured interviews using a standard set of questions developed by the researchers and community co-researchers	– Community characteristics associated with low alcohol abuse were: positive adult role models, rites of passage involving the opportunity to contribute to the community, limit setting on alcohol behavior, and the provision of safe places for children. – Family characteristics associated with low alcohol abuse were: close relationships with parents; parents acting as teachers/providing guidance; safe family environment where abusive alcoholic behavior was not tolerated; modeling of sobriety; expression of praise, affection, and specialness of the child; and transmission of cultural expectations and values. – Individual characteristics associated with low alcohol abuse were: wanting to be a role model, giving to others by contributing to the community, believing in one's value and potential, awareness of consequences of one's behavior, "interconnection" (a cultural term specific to the population), having awareness of life goals, and self-efficacy
Delinquent Behavior	Mmari et al. (2010)	172 adolescent and adult AIs from an urban tribal community in the Southwest, a rural reservation in the Southwest, or a urban tribal community in the Midwest	Qualitative Focus groups identified protective factors linked to adolescents' non-delinquent behavior	Focus group guide developed by the researchers through key informant interviews at each site	– Community-level protective factors associated with low delinquent behavior were: tribal language, and adolescent involvement in ceremonies and pow wows. – School-level protective factors associated with low delinquent behavior were: mentors and role models in whom adolescents could confide. – Family-level protective factors associated with low delinquent behavior were: parental support.

Health/Social Outcome	Publication	Study Population	Study Methodology	Instrument	Identified Protective Factors
					– Individual-level protective factors associated with low delinquent behavior were: religion or sense of spirituality, and motivation to succeed in life.
Depression	Barney (2001)	2,034 AI students, 7th–12th grade, from reservation-based schools in 8 IHS service areas	Cross-sectional Self-administered, structured, close-ended survey	National American Indian Adolescent Health Survey (1988)	– Protective factors associated with low number of depressive symptoms were: feeling cared about by family, feeling cared about by non-familial adults, and help- seeking behaviors (defined as an adolescent's willingness to seek help from a parent or other adult).
Emotional Health	Cummins et al. (1999)	13,454 AIAN students, 7th–12th grade, from reservation-based schools in 8 IHS service areas	Cross-sectional Self-administered, structured, close-ended survey	National American Indian Adolescent Health Survey (1991–1992)	– Protective factors associated with emotional health in females were: perceived family caring, body pride, and religiosity. – Protective factors associated with emotional health in males were: perceived family caring, body pride, religiosity, and identification of a personal area of skill or competence
Resilience	LaFromboise et al. (2006)	212 AI students, ages 10 to 15 (mean age=12.1–12.2) living on or near three reservations in the upper Midwest	Cross-sectional Adolescents self-administered structured, closed-ended surveys	*Enculturation* was measured using the American Indian Cultural Identification Scale (Oetting & Beauvais, 1991) and additional questions developed through focus groups with local tribal members. Other close-ended questions were developed by the researchers and tribal community members to measure *community support* and *maternal warmth*.	– Protective factors associated with resilience were: enculturation, community support, and maternal warmth.
Substance Use	Moilanen et al. (2014)	5,701 AIAN students, grades 8, 10 and 12, attending Arizona schools	Cross-sectional Self-administered, structured, close-ended survey	Arizona Youth Survey (AYS) (2010)	– Protective factor associated with low substance use was: availability of extra curricular activities to adolescents.
Substance Use	Whitesell et al. (2014)	381 AI students, 6th and 7th grade, attending seven different schools on a rural, northern Plains reservation	Cross-sectional Self-administered, structured, close-ended survey	Close-ended questions developed by the researchers	– Protective factors associated with low substance use were: parent-child relationship, and pro-social peer influence.
Substance Use	Yu & Stiffman (2010)	196 urban and 205 reservation-based youth, ages 13 to 19 (M= 15.4), living in a Southwestern state	Cross-sectional Face-to-face, structured, close-ended interviews	*Positive family relationships* were measured using an adapted version of the Family Satisfaction Scale (Hudson, 1982).	– Protective factor associated with low substance abuse/ dependence was: positive family relationships.
Suicide Attempt	Borowsky et al. (1999)	11,666 AIAN students, 7th–12th grade, from reservation-	Cross-sectional	National American Indian Adolescent Health Survey (1990)	– Protective factors associated with low suicide attempt were: discussing problems with friends or family

Health/Social Outcome	Publication	Study Population	Study Methodology	Instrument	Identified Protective Factors
		based schools in 8 IHS service areas	Self-administered, structured, close-ended survey		members, good emotional health, and family connectedness.
Suicide Attempt	Mackin et al. (2012)	503 AIAN students, ages 12 to 18 (mean age= 15), attending Oregon public schools	Cross-sectional Self-administered, structured, close-ended survey	Oregon Healthy Teens Survey (2006)	– Protective factors associated with low suicide attempt were: ate breakfast seven out of seven days, very good or excellent physical health, and feeling able to handle problems (self-efficacy).
Suicide Attempt	Pettingell et al. (2008)	569 AIs, ages 9 to 15 (mean age= 11.9), attending urban-based schools in Minneapolis, MN or attending an after-school program in Minneapolis, MN	Cross-sectional Self-administered, structured, close-ended survey	Urban Indian Health Survey (1995–1998)	– Protective factor associated with low suicide attempt in females was: having a positive mood. – Protective factors associated with low suicide attempt in males were: having a positive mood, and parental pro-social behavior norms.
Suicide Attempt, Suicide Ideation, Hopelessness	Pharris et al. (1997)	1,157 AIAN students, 7th–12th grade, from reservation-based schools in 8 IHS service areas, who self- reported past sexual abuse	Cross-sectional Self-administered, structured, close-ended survey	National American Indian Adolescent Health Survey (1988–1990)	– Protective factors associated with the absence of suicide attempt in females were: attention from family, parental expectations, parent caring, and positive feelings about school. – Protective factors associated with the absence of suicide attempt in males were: positive feelings about school, family caring, involvement with traditional activities, and doing well in school. – Protective factors associated with the absence of suicide ideation in females were: family caring, parent caring, tribal leader caring, adult caring, attention from family, doing well in school, positive feelings about school, and parental expectations. – Protective factors associated with the absence of suicide ideation in males were: attention from family, adult caring, school officials caring, tribal leaders caring, and doing well in school. – Protective factors associated with the absence of hopelessness in females were: family caring, attention from family, tribal leaders caring, positive feelings about school, adult caring, and parental expectations. – No significant protective factors associated with the absence of hopelessness were identified for males.
Tobacco Use	LeMaster et al. (2002)	2,390 AI students, ages 13 to 20 (mean age= 16.2), in 10 Western AI communities	Cross-sectional Self-administered, structured, close-ended survey	*Social support* was measured using a social support scale (Zimet et al., 1998). *Community mindedness* was measured using an adapted version of a community mindedness scale (Sack et al., 1987). Other close-ended questions developed by the researchers to measure *academic orientation* and *ethnic identity*.	– Social support, community mindedness, academic orientation, and ethnic identity were not found to significantly contribute to tobacco use.

Health/Social Outcome	Publication	Study Population	Study Methodology	Instrument	Identified Protective Factors
Tobacco Use	Osilla et al (2007)	112 AIANs, ages 13 to 19 (mean age= 15), participating in a Seattle-based life-skills program	Cross-sectional Face-to-face, researcher administered structured, close-ended interviews	Comprehensive Adolescent Severity Inventory (CASI)	– Protective factors associated with low tobacco use were: an adolescent possessing college aspirations, participation in a sports team, and participation in music.
Violent Behavior	Pu et al. (2013)	630 AI students, 6th to 12th grade, from 5 Midwestern rural school (4 of 5 schools located on reservations)	Cross-sectional Self-administered, structured, close-ended survey	Youth Intervention Project survey (1998) with an additional question developed by the researchers to measure adolescents' *interest in his or her tribe*.	– Protective factors associated with low violent behavior were: perceived parental monitoring, self-efficacy in avoiding violence, and an interest in culture.
Violent Behavior & Weapon Carrying	Bearinger et al. (2005, 2010)	577 AI adolescents, ages 9 to 15 (mean age= 11.9), attending various urban-based schools in Minneapolis, MN or attending an after-school program in Minneapolis, MN	Cross-sectional Self-administered, structured, close-ended survey	Urban Indian Health Survey (1995–1998)	– Protective factors associated with low violent behavior were: school connectedness (defined as an adolescent feeling cared about by school staff and feeling school attendance was valued), peer pro-social behavior norms, and parent pro- social behavior norms. – Protective factors associated with low weapon-carrying were: school connectedness, and peer pro-social behavior norms.

Table 2

Protective factors identified in the literature by protective factor thematic category

Socio-Ecological Level	Protective Factor Thematic Category	Definition	Example Protective Factors Identified in the Literature
Individual Protective Factors	Current/Future Aspirations	An adolescent possessing goals and/or positive outlook regarding the present and/or future	College aspirations[10]; motivation to succeed in life[8]; wanting to be a role model[1]; having awareness of life goals[1]; positive feelings about school[12]; doing well in school[12]
	Personal Wellness	An adolescent possessing a high-level of personal health and wellness	(Eating) breakfast seven out of the last seven days[7]; very good or excellent physical health[7]; emotional health[4]; positive mood[10]
	Positive Self-Image	An adolescent possessing a positive view of him or herself	Believing in one's value and potential[1]; body pride[5]; identification of a skill[5]; high self-esteem[14]
	Self-Efficacy	An adolescent possessing the feelings of being able to perform certain behaviors to accomplish goals	Feeling able to handle problems[7]; self-efficacy[1,13]
Relationship Protective Factors	Non-Familial Connectedness	Positive relationship and or interactions between an adolescent and members of his or her school or neighborhood that are not family members	Feeling cared about by adults[2,12]; community support[6]; discussing problems with friends[4]; mentors[8]; school connectedness[3]; prosocial peer influence[15]
	Family Connectedness	Positive relationship and/or interactions between an adolescent and members of his or her family	Close relationships with parents[1]; parents providing guidance[1]; expression of praise, affection, and specialness of the child[1]; discussion problems with family[4]; family connectedness[4]; family caring[12]; attentions from family[12]; parent caring[12]; feeling cared about by family[2,5]; maternal warmth[6,14]; parent-child relationships[15]; parental monitoring[13]; parental support[8]; positive family relationships[16]
Community Protective Factors	Positive Opportunities	Opportunities available to an adolescent within his or her school or community which provide the opportunity to engage in positive behaviors	Availability of extra curricular activities[9]; participation in sports[10,14]; participation in clubs[14]; participation in music[10]; opportunity to contribute to the community[1]
	Positive Social Norms	Individuals within an adolescent's community who establish expectations of healthy behavior and/or serve as an example of healthy behavior	Parent prosocial behavior norms[3,11]; peer prosocial behavior norms[3,15]; positive adults role models[1]; modeling (of healthy behaviors)[1]
Multi-Level Protective Factors	Cultural Connectedness	Any aspect of an adolescent's life that is uniquely influenced by his or her connection and/or engagement with his or her tribal culture	Enculturation[6,14]; interest in AIAN culture[13]; transmission of cultural expectations and values[1]; "interconnection"[1]; tribal language[8]; involvement in ceremonies and pow

Socio-Ecological Level	Protective Factor Thematic Category	Definition	Example Protective Factors Identified in the Literature
			wows[8]; involvement with traditional activities[12]

[1] Allen et al. (2006);

[2] Barney (2001);

[3] Bearinger et al. (2005, 2010);

[4] Borowsky et al. (1999);

[5] Cummins et al. (1999);

[6] LaFromboise et al. (2006);

[7] Mackin et al. (2012);

[8] Mmari et al. (2010);

[9] Moilanen et al. (2014);

[10] Osilla et al. (2007);

[11] Pettingell et al. (2008);

[12] Pharris et al. (1997);

[13] Pu et al. (2013);

[14] Whitbeck et al. (2001);

[15] Whitesell et al. (2014);

[16] Yu & Stiffman (2010).

Table 3

Protective factor categories and the health/social outcomes on which they have been identified as having a positive effect organized by theme and socio-ecological domain

Protective Factor Thematic Category	**Health/Social Outcomes**									
	Academic Success	**Alcohol Abuse**	**Delinquent Behavior**	**Depression**	**Emotional Health**	**Resilience**	**Substance Use**	**Suicide**	**Tobacco Use**	**Violent Behavior**
Individual-Level										
Current/Future Aspirations		X[1]	X[8]					X[12]	X[10]	
Personal Wellness								X[4,7,11]		
Positive Self-Image	X[14]	X[1]			X[5]					
Self-Efficacy		X[1]						X[7]		X[13]
Relationship-Level										
Non-Familial Connectedness			X[8]	X[2]		X[6]	X[15]	X[4,12]		X[3]
Family Connectedness	X[14,16]	X[1]	X[8]	X[2]	X[5]	X[6]	X[15]	X[4,12]		X[13]
Community-Level										
Positive Opportunities	X[14]	X[1]					X[9]		X[10]	
Positive Social Norms		X[1]					X[15]			X[3]
Multi-Level										
Cultural Connectedness	X[14]	X[1]	X[8]			X[6]		X[12]		X[13]

[1]Allen et al. (2006);

[2]Barney (2001);

[3]Bearinger et al. (2005, 2010);

[4]Borowsky et al. (1999);

[5]Cummins et al. (1999);

[6]LaFromboise et al. (2006);

[7]Mackin et al. (2012);

[8]Mmari et al. (2010);

[9] Moilanen et al. (2014);
[10] Osilla et al. (2007);
[11] Pettingell et al. (2008);
[12] Pharris et al. (1997);
[13] Pu et al. (2013);
[14] Whitbeck et al. (2001);
[15] Whitesell et al. (2014);
[16] Yu & Stiffman (2010).