

Relationship Between Social Support and Substance Use Among American Indian People With a Self-Identified Substance Use Problem

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Relationship Between Social Support and Substance Use Among American Indian People With a Self-Identified Substance Use Problem

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Objectives: The present study sought to understand the relationship between social support and substance use among American Indian adults with substance use disorder. **Method:** As part of a larger community-based participatory research project, we conducted a cross-sectional survey with 198 tribal members from a rural reservation community who self-identified as having a substance use problem. We examined associations between participant substance use and social network characteristics assessed using a modified version of the Important People Drug and Alcohol interview. **Results:** Variables associated with greater drug and alcohol abstinence among participants included living in larger household, having a greater percentage of the household that is sober, not having attended boarding school, having a larger percentage of the social network that does not accept one's substance use, having a smaller percentage of the social network rated as moderate or heavy substance users, and having a smaller percentage of the social network that uses substances frequently. The size, general supportiveness, and importance of the social network were not significantly associated with participant substance use. **Conclusions:** Network substance use behavior was a better predictor of participant substance use outcomes than general support, substance-specific support, or support for recovery/treatment.

Public Significance Statement

Social support is protective against substance use in non-Native samples but has not been investigated among American Indian people with substance use problems. In this study with AI participants, the substance use behavior of the social network was more strongly associated with participant substance use than general support, substance-specific support, or support for recovery/treatment. Larger household size and greater abstinence among household members were associated with more abstinent days among participants.

Keywords: American Indian, substance use, social support, community-based participatory research

Despite having high rates of abstinence from alcohol and other drugs, American Indians and Alaska Natives (AI/ANs) face serious health disparities related to substance use disorders (SUDs). Research has shown that AI/ANs consume alcohol less often than other racial groups, but when drinking, consume larger quantities (Beals et al., 2003; Cunningham et al., 2016). Additionally, despite lower rates of past-year alcohol use, AI/ANs had greater rates of past-year alcohol use disorder (AUD) relative to the national average (19.2% vs. 13.9%;

Center for Behavioral Health Statistics and Quality, 2021). A national survey found that 43.4% of AI/ANs had experienced AUD in their lifetime—a rate markedly higher than the national average of 29.1% (Grant et al., 2015). There also is evidence of greater past-year illicit drug use and SUD among AI/ANs relative to other racial groups in the United States (Center for Behavioral Health Statistics and Quality, 2021; Rieckmann et al., 2012). Disparities related to substance use are not attributable to genetic factors (Enoch & Albaugh, 2017) but

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are better explained by structural inequities and other environmental factors rooted in oppression (Evans-Campbell, 2008; Gameon & Skewes, 2021; Heart, 2003; Whitesell et al., 2012).

Factors associated with substance use disparities among AI/ANs include historical and contemporary trauma, including trauma related to boarding school attendance (Whitesell et al., 2012), psychological stress from racism (Farahmand et al., 2020), loss of culture and identity (Skewes & Blume, 2019), greater rates of poverty (Probst & Ajmal, 2019; Smyth & Kost, 1998), and scarcity of culturally grounded SUD treatments (James et al., 2017; Rosenblatt et al., 2015; Skewes et al., 2019). There also is evidence of greater mental health problems among AI/ANs, which are associated with SUD through the use of substances to cope with distress (Ehlers et al., 2013). Many of these mental health problems are related to greater trauma exposure among AI/ANs (Bassett et al., 2014). For example, the prevalence of posttraumatic stress disorder (PTSD) among AI/ANs (22.9%) is double the rate among Whites (11.7%), and AI/ANs with PTSD experience greater rates of AUD relative to Whites with PTSD (Emerson et al., 2017). Anxiety and depression also are prevalent among AI/ANs (McKinley et al., 2021) and may contribute to SUD when people use substances to self-medicate psychiatric symptoms (T. M. Kelly & Daley, 2013; National Institute on Drug Abuse, 2022). While the link between mental health and substance use is not unique to AI/ANs, greater trauma exposure is associated with increased rates of some mental health problems and SUDs in this population (Herron & Venner, 2023).

Despite these risk factors, AI/AN communities have numerous strengths and have demonstrated powerful resilience. Protective factors such as cultural identity and supportive social networks play a role in preventing substance use and SUD (Baldwin et al., 2011; Skewes et al., 2019). Many AI/AN cultures are collectivist in nature, centering on the family and community rather than the individual (Whitesell et al., 2012). In close-knit, interconnected AI/AN communities that value interdependence, social support for recovery may be particularly important for preventing substance use and also may play an important role in SUD recovery (Mohatt et al., 2004). The purpose of this research is to examine the role of social support in substance use among AI participants with SUD from a rural reservation community.

Social Support and Substance Use

Social support is a critical resource for managing stressors and includes functional support (e.g., providing tangible resources), informational support (e.g., providing knowledge or information), and emotional support (e.g., providing warmth and nurturing; Taylor, 2011). Additionally, simply the perception that social support is available if needed is an important resource for managing stress (Taylor, 2011). Social support may be general (e.g., supporting one's well-being) or substance-specific (e.g., supporting one's decreased substance use or treatment seeking; Longabaugh & Beattie, 1985, 1986). Social support has been shown to predict substance use in non-Native samples (Owens & Zywiak, 2016), and there is reason to believe that social support may be especially important for AI/ANs due to the collectivist cultural orientation of Native communities (Mohatt et al., 2004).

Perceived social support has been linked to better substance use outcomes including greater self-efficacy for abstinence (Stevens et al., 2015) and decreased substance use (Tan et al., 2021). One

indicator of social support, family involvement in SUD treatment, has been shown to predict lower rates of relapse (S. M. Kelly et al., 2010). Emotional and functional social support strongly predict long-term abstinence among people with SUD (Beattie & Longabaugh, 1999; Havassy et al., 1991; Witkiewitz & Marlatt, 2004). Conversely, lack of social support has been associated with using alcohol as a coping mechanism, which is associated with greater substance use consequences (Holahan et al., 2004) and poorer outcomes, such as dropping out of treatment (Dobkin et al., 2002) and increased risk of relapse after treatment (Hser et al., 1999). Due to the strong relationship between social support and SUD outcomes, research suggests that efforts to increase social support should be incorporated into SUD treatment programs (Dobkin et al., 2002; Lookatch et al., 2019; Stevens et al., 2015).

Important People Drug and Alcohol Interview

While greater perceived social support is linked to decreased substance use (e.g., Tan et al., 2021), some social network characteristics may be protective, whereas others may increase the risk for substance use. The Important People Drug and Alcohol interview (IPDA; Zywiak et al., 2009) and its predecessor, the Important People and Activities instrument (Clifford & Longabaugh, 1991), have been used in non-Native populations to examine the relationship between social network characteristics and substance use. These instruments assess general perceived social support as well as social network characteristics hypothesized to be important for understanding and predicting substance use behavior. For example, the IPDA has been used to assess the substance use behavior of social network members, the respondent's perception that the network is supportive of substance use, and the perception that the network is or would be supportive of the respondent's treatment and recovery (e.g., Zywiak et al., 2002).

Previous research using the IPDA found that larger social networks and those with more supportive relationships were associated with better substance use outcomes (Zywiak et al., 2002). Zywiak et al. (2002) found that more daily contact with network members (a proxy for measuring investment in one's network) was associated with higher rates of abstinence. Substance-specific support was shown to be a better predictor of substance use outcomes than general support (Beattie & Longabaugh, 1999; Havassy et al., 1991; Longabaugh et al., 1993). One study using the IPDA found that the social network's substance involvement was a more powerful predictor of the respondent's substance use than perceived general support, support for treatment, or support for substance use (Zywiak et al., 2009). Additionally, individuals who had networks with a greater percentage of abstainers had better substance use outcomes than those with a greater number of moderate or heavy drinkers/users (Zywiak et al., 2002). Therefore, it appears that the substance use behavior of the social network may be a stronger predictor of participant substance use than whether the participant perceives that the network supports their substance use or treatment/recovery. However, to our knowledge, no studies have examined social support as measured by the IPDA among tribal members.

The Present Study

In this study, we conducted secondary data analyses to examine the relationship between social support and substance use among

AIIs with a self-identified substance use problem residing in a rural reservation community. Data were gathered as part of a community-based participatory research project that aimed to understand risk and protection for substance use in the reservation context. In the present study, we aimed to explore associations between social support variables derived from the IPDA and participants' recent alcohol and drug use, and to understand which social network characteristics most strongly predicted substance use in this sample. In addition, we conducted analyses to test the associations of two other variables with substance use: whether or not the participant had attended boarding school (as a proxy for trauma exposure) and size of the participant's household. Larger household sizes in AI/AN communities may represent greater social support, and household members may facilitate recovery by providing instrumental or emotional support during treatment (Magarati et al., 2022). However, if household members are currently using substances, the social network may be a risk factor instead. Therefore, we also examined the percentage of the participant's household that is sober (i.e., abstinent from alcohol and drugs) as a predictor of the participant's substance use.

Method

Procedure

All study measures and procedures were approved by the project's community advisory board and the tribal institutional review board. Participants provided informed consent prior to data collection, which took place in a private study room at the tribal college library. Participants were offered refreshments, as is custom in this community, and were engaged in an informal conversation to help them feel at ease. Following this conversation, assessments of social support and substance use were administered by a trained research assistant in an interview format. Participants then completed a packet of self-report instruments designed to assess constructs related to risk and protection for SUD, including assessments not examined in the present study. Participants had the option to complete the paper-and-pencil measures independently or in an interview format whenever literacy was a concern. The study took about 2 hr to complete, and participants were compensated with a \$50 gift card for their time. Upon completion, participants received information about mental health and substance use treatment resources available in the community.

Participants

Participants were 198 AI adults who self-identified as having a substance use problem and were trying to recover. The sample included men (48%) and women (52%); no other genders were represented in the sample. Ages ranged from 18 to 65 ($M = 37.36$, $SD = 11.81$). Median income was well below the poverty line at \$190.50 per month. Although there were a few outliers, 45.9% of the sample had no monthly income, and 83.1% earned less than \$1,000 per month. Household sizes ranged from 1 to 15 people ($M = 3.87$, $SD = 2.53$). Regarding educational attainment, 50.20% had no high school diploma, 34% had completed 12th grade or the General Educational Development test, and 12.7% reported some college or a college degree. Of the 198 participants, 70 had attended boarding school (35.4%). Regarding previous experiences with SUD treatment,

27.8% reported no past treatment, 45.5% reported receiving outpatient SUD treatment on the reservation, and 26.8% had received inpatient treatment off the reservation. Participants mostly reported marijuana, alcohol, or methamphetamine as their primary substance of choice.

Measures

Background and Demographics

Participants self-reported background and demographic data, including gender, age, monthly income, highest level of education, whether they had attended an AI/AN boarding school, the primary substance(s) used, and substance use treatment history. They also reported the total number of people in their household and the number of household members who are abstinent from alcohol and other drugs. These questions were used to calculate a new variable, percent of the household that is sober, to be used in analyses.

Social Support and Network Characteristics

A modified version of the IPDA that refers to drug and/or alcohol use (Center on Alcohol, Substance Use, and Addictions, n.d.) was used to measure social support and characteristics of the social network. Participants are asked to list up to 12 people who are important to them and with whom they have had contact in the past 4 months and to indicate their relationship with each person (e.g., parent, spouse, friend). Although the IPDA was capped at 12 network members, this was not an issue as no participant listed more than 11. Participants then rate the frequency of contact with each network member on a 7-point scale from *once in the past 4 months* (1) to *daily* (7) and how important each person is to them on a 6-point scale from *not at all important* (1) to *extremely important* (6). Participants then rate the extent to which each network member is generally supportive of them on a 6-point scale from *not at all supportive* (1) to *extremely supportive* (6).

Participants are asked to indicate each network member's drinking or drug use status (*recovering from addiction*, *abstainer*, *light drinker or user*, *moderate drinker or user*, *heavy drinker or user*) and to estimate the frequency with which each network member uses alcohol or drugs from *not in past 4 months* (1) to *daily* (7). They then rate how each network member has reacted (or would react) to the participant's drinking or drug use on a 5-point scale from *left or made you leave when you are drinking or using* (1) to *encouraged the participant's substance use* (5). Finally, participants rate how each network member has felt (or would feel) about the participant seeking treatment or changing their substance use rated on a 6-point scale from *strongly opposes it* (1) to *strongly supports it* (6). Each item also includes a *do not know* response option. The IPDA is administered in a structured interview format by a trained researcher.

We calculated additional variables from the IPDA data for use in the analyses. For example, when looking at the substance use status of the social network, participants rated each network member's drinking or drug use status on a 5-point scale (*in recovery*, *abstainer*, *light user*, *moderate user*, *heavy user*). We calculated the frequency of each response and created a new variable representing the percentage of the network that fell into each category (*percent of the network in recovery*, *percent of the network that are abstainers*, etc.). We also combined some responses to create new composite

variables. For example, *percent of the network that does not use substances* was created by summing the number of network members rated as either in recovery or abstainers and dividing by the size of the participant's network. We took this approach to calculate the percentage of the network that opposes or strongly opposes the participant's substance use, supports or encourages the participant's substance use, and supports or strongly supports the participant's recovery. We also calculated the percentage of the network that fell into each substance use category (e.g., % frequent users, % heavy users). We calculated percentages rather than frequencies to account for differing network sizes (e.g., the number of people who support one's recovery may have a larger influence on the participant's substance use if they have a small vs. large network).

Substance Use

The Timeline Followback (Sobell & Sobell, 1992) was used to assess substance use over the past 90 days. The Timeline Followback has strong validity and reliability for measuring alcohol and drug use (Fals-Stewart et al., 2000) and has been used successfully in the present population (Gameon & Skewes, 2021; Gonzalez & Skewes, 2021; Skewes et al., 2020). Participants are presented with a calendar reflecting the assessment period, anchored with holidays and important personal events to assist with recollection of their substance use. Participants are led through a series of questions and asked to report the quantity of alcohol and the type of drugs consumed on each day during the assessment period. In the present study, the outcome variable was the number of days abstinent from alcohol and drugs in the past 90 days.

Data Analyses

Data were analyzed using IBM SPSS Statistics (Version 28). Descriptive statistics and bivariate correlations were examined for all study variables. Variables that significantly correlated with the outcome variable, number of abstinent days, were included in a subsequent hierarchical linear regression analysis.

Variables from the demographic questionnaire significantly correlated with abstinence were boarding school attendance, household size, and percentage of the household rated as sober. Variables from the IPDA that were correlated with number of abstinent days included the

percent of the network that does not accept the participant's substance use and the percent of the network that uses substances often. Percent of the network rated as heavy substance users was also significantly correlated with number of abstinent days; however, this variable was highly correlated with percent of the network that used substances often, indicating potential multicollinearity issues. Percent of the network that used substances often was chosen for inclusion in the regression due to the greater magnitude of correlation with the number of abstinent days. Total network size, importance of the network members, and general supportiveness of the network were not significantly associated with participant substance use in this sample and therefore were excluded from the regression analysis.

A hierarchical linear regression analysis was conducted to examine the relationship between network characteristics and the participant's number of abstinent days. In the first step, household size and boarding school attendance were included as covariates to control for their potential confounding effects. This initial step ensured that any influence these variables might have on abstinent days was accounted for. In the second step, three predictors were introduced: the percent of the network that did not accept substance use, the percent of the network that used substances often, and the percent of the household rated as sober. This two-step approach allowed us to evaluate the unique contribution of these network characteristics to the number of abstinent days, beyond the effects of household size and boarding school attendance.

Results

Descriptives

Alcohol was the most commonly used substance (42.3%; $n = 80$), followed by marijuana (16.4%; $n = 31$), methamphetamine (12.2%; $n = 23$), opioids (3.2%; $n = 6$), and unspecified prescription pills (2.1%; $n = 4$). Additionally, 23.7% of participants reported polysubstance use ($n = 45$). Participants reported a mean of 48.26 days abstinent ($SD = 35.06$, range = 0–90), 19.56 drinking days ($SD = 26.88$, range = 0–90), 18.57 drinks per drinking day ($SD = 14.89$, range = 1–70.48), and 28 drug use days ($SD = 35.54$, range = 0–90) over the 90-day period (Table 1).

Participants reported a mean total network size of 7.19 people ($SD = 2.34$) with an average daily network of 3.54 ($SD = 2.17$).

Table 1
Descriptive Data for Study Variables

Variable	<i>M</i>	<i>SD</i>	Minimum	Maximum
Number of abstinent days	48.26	35.06	0.00	90.00
Total size of the network	7.19	2.34	1.00	11.00
Size of the daily network	3.54	2.17	0.00	10.00
Household size	3.87	2.53	1.00	15
% of the household that is sober	52.09%	38.99%	0.00%	100%
% of the network rated as supportive	99.50%	3.19%	67%	100%
% of the network rated as important	87.64%	19.73%	17%	100%
% of the network rated as heavy substance users	19.37%	23.39%	0%	100%
% of the network that does not use substances	39.92%	26.33%	0%	100%
% of the network that uses substances often	27.47%	26.90%	0%	100%
% of the network that does not accept substance use	32.52%	30.19%	0%	100%
% of the network that accepts/encourages substance use	33.71%	30.59%	0%	100%
% of the network that supports recovery	64.05%	34.07%	0%	100%
% of the network that opposes recovery	4.69%	15.27%	0%	100%

Participants rated 97% of network members as important to them and 99.50% of network members as supportive. A mean of 32.52% ($SD = 30.19$) of network members did not accept the participant's substance use and 33.71% ($SD = 30.59$) accepted or encouraged their substance use. On average, 64.05% ($SD = 34.07$) of the network members were rated as supportive of the participant's recovery, with 4.69% ($SD = 15.27$) rated as opposing the participant's recovery. Participants reported that 52.09% of their household is sober, on average ($SD = 38.99$).

Bivariate Correlations

There was no significant relationship between gender ($r = -.03$, $p = .680$), age ($r = -.06$, $p = .431$), monthly income ($r = .01$, $p = .946$), or having received prior treatment ($r = -.01$, $p = .845$) with number of abstinent days. Having attended boarding school was associated with fewer abstinent days ($r = -.21$, $p = .003$). Participants living with more people and, more importantly, those with a greater percentage of sober people in their household reported significantly more abstinent days in the assessment period (see Table 2).

Neither total network size nor size of the daily network was associated with abstinent days. The percentage of the network that uses substances often (i.e., —three to six times a week or daily) was associated with fewer abstinent days ($r = -.26$, $p < .001$), but there was no association between the percentage of the network that did not use substances at all and abstinent days ($r = .11$, $p = .130$). Additionally, the percentage of the network that does not accept the participant's substance use (i.e., did not accept or left/made you leave when you are drinking or using drugs) was associated with greater abstinent days ($r = .17$, $p = .022$); however, the percentage of the network that encourages substance use was not ($r = -.09$,

$p = .204$). Neither the percentage of the network that supports recovery (i.e., support or strongly support you seeking treatment or changing your substance use) nor the percentage that opposes recovery (i.e., oppose or strongly oppose you seeking treatment or changing your substance use) was associated with abstinent days ($r = .13$, $p = .083$; $r = .09$, $p = .203$, respectively).

Regression Analysis

The full model explained 18.6% of the variance in abstinent days ($R^2 = .186$, $p < .001$), with household size associated with more abstinent days, $B (SE) = 2.10 (1.01)$, $\beta = .15$, $p = .040$; the percentage of the network that frequently used substances associated with fewer abstinent days, $B (SE) = -23.82 (10.09)$, $\beta = -.18$, $p = .019$; and the percent of the household that is sober associated with more abstinent days, $B (SE) = 19.17 (6.71)$, $\beta = .21$, $p = .005$; see Table 3. Boarding school attendance and the percentage of the network that does not accept substance use were not significantly associated with abstinent days (see Table 3).

Discussion

The goal of this study was to examine the relationship between social support as measured by the IPDA and substance use behavior in a sample of AI tribal members with a self-identified substance use problem. We also examined the associations of some demographic/background variables (i.e., boarding school attendance, household size, and percent of the household rated as sober) with substance use due to their significant bivariate correlations with number of abstinent days in the past 90 days. While some findings were consistent with previous research, the present study presents several novel findings.

Table 2
Correlations Among Study Variables

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Abstinent days	—														
2. Network size	.01	—													
3. Household size	.21**	.06	—												
4. % Household sober	.32**	-.03	.12	—											
5. Boarding school	-.21**	.06	.02	-.22**	—										
6. % Heavy users	-.17*	-.03	-.02	-.22**	.15*	—									
7. % Nonusers	.11	-.09	.04	.20**	-.07	-.38**	—								
8. % Often users	-.26**	.04	-.10	-.23**	.09	.69**	-.49**	—							
9. % Do not accept	.17*	-.10	.14*	.14	-.07	-.19**	.44**	-.34**	—						
10. % Accept/encourage	-.09	-.03	-.07	-.18*	.06	.41**	-.29**	.53**	-.47**	—					
11. % Supports recovery	.13	-.16*	.04	.25**	.00	-.11	.30**	-.19**	.39**	-.06	—				
12. % Opposes recovery	.09	.02	.17*	-.14	-.07	.02	-.08	.10	-.11	.13	-.36**	—			
13. % Supportive	.00	.01	.01	.04	-.18*	-.02	-.07	.03	.10	-.08	-.08	.05	—		
14. Daily contact	-.02	.42**	.14	.08	.07	.03	-.09	.05	.05	.06	-.10	.07	.04	—	
15. Importance	.03	.00	.08	.13	-.02	-.13	.26**	-.20**	.20**	-.19**	.17*	-.07	.01	.21**	—

Note. Abstinent days = total number of abstinent days over the past 90 days; Network size = total number of network members; Household size = total number of people you live with; % Household sober = percentage of the household that does not drink alcohol or use other drugs; Boarding school = whether the participant had attended boarding school or not (0 = no, 1 = yes); % Heavy users = percentage of the network rated as heavy drinkers or substance users; % Nonusers = percentage of the network that does not use alcohol or drugs; % Often users = percentage of the network that uses substances —three to six times per week or daily; % Do not accept = percentage of the network that did not accept or made you leave when drinking or using drugs; % Accept/encourage = percentage of the network that accepted or encouraged your drinking or drug use; % Supports recovery = percentage of the network that supports or strongly supports you seeking treatment; % Opposes recovery = percentage of the network that oppose or strongly oppose you seeking treatment; % Supportive = percentage of the network rated as generally supportive; Daily contact = number of people in the network the participant has daily contact with; Importance = average importance rating of the participant's network.

* $p < .05$. ** $p < .01$.

Table 3*Multiple Regression Predicting Abstinent Days From Social and Household Factors*

Variable	<i>B</i>	<i>SE</i> (<i>B</i>)	β	R^2	ΔR^2
Step 1					
Constant	42.69	5.49		.081	.081**
Household size	2.77	1.06	.20**		
Boarding school attendance	-14.57	5.36	-.20**		
Step 2					
Constant	37.51	7.96		.186	.106**
Household size	2.10	1.01	.15*		
Boarding school attendance	-9.52	5.22	-.13		
% did not accept substance use	6.89	8.67	.06		
% used substances often	-23.82	10.09	-.18*		
% of the household that is sober	19.17	6.71	.21**		

Note. Multiple regression predicting number of abstinent days from household size, boarding school attendance, substance-specific social support, frequency of network substance use, and percentage of household members rated as sober. *SE* (*B*) = standard error of the unstandardized beta coefficient.

* $p < .05$. ** $p < .01$.

Network Size

Previous research has found that a larger total network size may protect against substance use (Zywiak et al., 2002) and that larger daily networks (i.e., a measure of investment in one's network) are associated with more abstinent days (Zywiak et al., 2002). However, in the present study, neither network size nor size of daily network was associated with abstinent days. However, the participant's household size was significantly positively associated with the number of abstinent days. This suggests that a larger household, rather than a larger network in general, is protective in this sample. It may be that living with more people results in more available social support, or household size may be a proxy for social network investment. Further research is needed to examine the nature and quality of relationships with household members to understand why larger household sizes appear to be protective, whereas larger social networks and larger daily networks do not.

Social Support

Previous research has found that greater general social support (Beattie & Longabaugh, 1999) and greater importance of the network members (Zywiak et al., 2009) were associated with better substance use outcomes. There was a ceiling effect in the present study, as participants rated nearly every person in their network as generally supportive (97% of the sample rated 100% of their networks as supportive) and rated 88% of their network members as important to them. This may be an indicator of resilience that reflects the importance and supportive nature of social relationships in this community. The high levels of general social support and importance of the network members found in this study are encouraging, but these variables were not associated with better substance use outcomes among the participants.

Other studies have found substance-specific social support (i.e., rejection of one's substance use and support for efforts to change) to better predict substance use outcomes than general social support (Beattie & Longabaugh, 1999; Havassy et al., 1991; Longabaugh et al., 1993; Zywiak et al., 2009). In the present study, the percent of the network that does not accept the participant's substance use was associated with greater abstinent days in zero-order correlations. However, when controlling for household size and boarding school attendance, percent of the network that did not accept substance use was not found to be a significant predictor of substance use in this sample. There also was a significant positive correlation between the percent of the network that does not accept one's substance use and the percent of the network that supports one seeking treatment or trying to change, suggesting that social networks that do not accept substance use also tend to support recovery. However, network percentage that supports recovery was not significantly associated with the number of days abstinent reported by the participant.

Network Substance Use

Consistent with findings from previous research (Zywiak et al., 2009), we found that network substance use was a stronger predictor of participant substance use outcomes than general support, substance-specific support, or support for recovery. However, previous research has found that individuals who had networks with a greater percentage of abstainers or people in recovery had better outcomes than those with a greater percentage of people who use substances (Zywiak et al., 2002). In the present study, the presence of frequent substance users in one's network was associated with fewer abstinent days among participants, but the presence of nonusers in one's network was not associated with participant substance use. However, the percentage of nonusers in the participant's household was a significant predictor of greater abstinence among participants. This suggests that the effect of network sobriety is more impactful when the participant is living with sober people rather than just having them in their broader network.

In the regression analysis, both the percentage of frequent users in the network and the percentage of household that is sober were significant predictors of the number of abstinent days. As exposure to drug cues is a precipitant of substance use (Bedi et al., 2011), having frequent substance users in one's network may increase exposure to triggers, resulting in fewer abstinent days, though not having these cues at home may offset substance use. Living with sober individuals may also expose the individual to better quality social support or other protective factors such as positive role models.

Boarding School Attendance

Boarding school attendance has been shown to be associated with substance use among AI/ANs (Evans-Campbell et al., 2012). In the present study, 35.4% of the sample had attended boarding school at some point in their lives. Consistent with previous research, the present study found a significant relationship between boarding school attendance and fewer abstinent days. When entered as a covariate in Step 1 of the regression model, boarding school attendance was found to be a significant predictor of substance use. However, when the predictor variables were added in Step 2 of the model, boarding school attendance was no longer significant.

Findings suggest that boarding school attendance may be considered an indicator of trauma in this sample and a risk factor

for substance use. Along with using substances to cope with traumatic experiences, there may be other factors to consider, such as lack of parental supervision at boarding schools potentially leading to initiation of substance use at an earlier age for some. Also, because research has found an association between being the descendant of someone who attended boarding school and substance use due to a historical trauma response or potential disruptions in parenting style and culture (Evans-Campbell et al., 2012), future studies should ask participants not only if they attended boarding school but also if they are a descendant of someone who attended boarding school. Historical and lived trauma should be addressed in SUD interventions with AI/AN people.

Implications and Recommendations

In the present sample, participants had frequent or daily contact with several people they considered important, the majority of whom were supportive of their recovery. In close, interconnected rural communities, advice to avoid others who are using substances is not realistic. Rather, SUD interventions with AI/ANs should teach skills for coping with substance use triggers and cravings brought about by interacting with people who use substances. Intervention participants may benefit from strategies to use the social support available to them in ways that support their recovery. For example, they could communicate the need to reduce substance use triggers to network members who drink or use drugs. Relatives of people trying to recover could benefit from advice to avoid drinking or using around the individual or to communicate that they do not accept the person's substance use and will not be around them when they are using but will reengage when the person is sober. This is consistent with the Community Reinforcement and Family Training approach that teaches loved ones to reinforce periods of sobriety and disengage with loved ones when they are under the influence (Meyers et al., 1998). Similar community reinforcement approaches may be especially beneficial in AI/AN communities.

Results showed a significant association between the percentage of the household that is sober and participant substance use. This speaks to the need for sober living houses on the reservation. Sober living homes, also known as recovery housing, do not provide treatment but do provide a substance-free living space, accountability, and peer support for tenants (Mericle et al., 2019). It is not realistic to ask someone to move or change the composition of their household in the absence of alternative housing options. If sober living options were available, individuals could increase their total household size, increase the percentage of their household that is sober, and may also increase the percentage of their network that does not accept one's substance use, all found to be protective factors. Sober living houses have been linked with better substance use, employment, and criminal justice involvement outcomes over time (Polcin et al., 2010). Tribes should consider investing in sober living houses to support community members trying to recover from SUD.

Other implications of this research include potential revisions to the IPDA for use in substance use research with AI/AN people. For example, if these results are replicated, it may be that questions regarding the importance and general supportiveness of the network members are not needed in future iterations of the measure. Trimming irrelevant items would reduce the length of the assessment and reduce participants' response burden. Asking participants to report the size of their household, the number of household members who are

sober, and how many network members use substances often may be adequate for assessing risk related to the social network.

Strengths, Limitations, and Future Directions

This study was the first to examine the relationship between social support and substance use among tribal members with a substance use problem. Strengths of this study include its focus on an understudied population and our use of a community-based participatory research framework to ensure the research was respectful and benefitted the community. The project's community advisory board was involved in developing the research questions, selecting the measures, determining the recruitment and data collection strategies, and interpreting the findings. This study also adds to the growing body of literature utilizing the IPDA in a population that is not represented in the extant literature and contributes new knowledge regarding the use of this measure with AI participants. Understanding which social network characteristics are most strongly associated with substance use can inform future SUD interventions implemented in tribal communities.

The present study also has limitations. For example, some participants may have had trouble gauging whether their network members were light, moderate, or heavy substance users or their frequency of use (once a month, 3–6 times a week, daily, etc.). Zywiak et al. (2009) argued that it may be easier for participants to accurately gauge drinking/drug use status for their network members than it is for them to gauge their general/treatment support or support for substance use. Researchers may consider asking participants to rate their confidence on each item to better understand how accurate their ratings may be or gathering collateral information from social network members themselves. Additionally, the present research assessed social support and respondent substance use over the recent past. Future research should examine whether characteristics of one's social network predict future substance use among AI people. Daily diary or ecological momentary assessment studies also may be helpful for understanding the role of social support in substance use behavior.

Another possible limitation of the present study is that drug/alcohol items were combined in this modified version of the IPDA to reduce the length of the interview rather than asking about alcohol and drugs separately. It is possible that network members may have been supportive of abstaining from drugs but not alcohol or vice versa. It also is possible that different social support variables may be more or less important for participants who use alcohol only, drugs only, or both drugs and alcohol. Furthermore, we did not examine the relationships of the network members listed on the IPDA to the participants. It may be that the social support provided by relatives had a greater influence on the participant's substance use relative to that provided by friends or colleagues. Additionally, participants did not identify which network members lived with them. Since household size and percentage of the household that is sober were both related to substance use in this sample, asking participants to identify which of their network members are also household members could help explore this relationship.

Constraints on Generality

It is important to note that participants were from one tribal community, and the results may not be generalizable to other communities or AI/AN cultural groups. Additionally, the effects

found for each significant predictor in this sample were small, with standardized β coefficients ranging from .15 to .21. This study should be replicated with other AI/AN samples to examine the generalizability of these findings. Also, all participants in the present study self-identified as having a substance use problem. We do not know whether these results apply to people who drink or use substances moderately. Future research is needed to understand the relationship between social support and social/occasional substance use. Future research also is needed to understand whether changing characteristics of one's social network (e.g., by increasing the number of people in recovery in one's network or household) affects substance use behavior over time.

Conclusion

AI/ANs have endured generations of traumatic experiences that have led to present-day health disparities, including substance use and addiction. Despite having many risk factors for substance use problems, AI/ANs also have many protective factors, such as supportive social networks. The present study was an important first step toward understanding how social network characteristics are related to substance use outcomes among AIs with SUD. Household size, frequent substance use of the social network, and abstinence among household members were significantly associated with abstinent days among participants. Findings may be used to inform future research on social support and substance use among AI/ANs and help develop interventions to address this important health disparity.

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