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Risk and protective factors for depressive symptoms among American Indian older adults: Adverse childhood experiences and social support

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Objectives: Despite efforts to promote health equity, many American Indian and Alaska Native (AI/AN) populations, including older adults, experience elevated levels of depression. Although adverse childhood experiences (ACE) and social support are well-documented risk and protective factors for depression in the general population, little is known about AI/AN populations, especially older adults. The purpose of this study was to examine factors related to depression among a sample of AI older adults in the midwest.
Method: Data were collected using a self-administered survey completed by 233 AIs over the age of 50. The survey included standardized measures such as the Geriatric Depression Scale-Short Form, ACE Questionnaire, and the Multidimensional Scale of Perceived Social Support. Hierarchical multivariate regression analyses were conducted to evaluate the main hypotheses of the study.
Results: Two dimensions of ACE (i.e., childhood neglect, household dysfunction) were positively associated with depressive symptoms; social support was negatively associated with depressive symptoms. Perceived health and living alone were also significant predictors.
Conclusion: ACE may play a significant role in depression among AI/AN across the life course and into old age. Social support offers a promising mechanism to bolster resilience among AI/AN older adults.

Keywords: adverse childhood experiences; American Indian; Native Americans; older adults; risk and protective factors; social support

Introduction

Healthy People 2020 proposes health equity, or the equal attainment of the highest health across populations, by eliminating health disparities and addressing historical oppression (US Department of Health and Human Services, 2013). Despite efforts to promote health equity, many American Indian and Alaska Native (AI/AN) populations, including older adults, experience elevated levels of depression, substance abuse and dependence, post-traumatic stress disorder, and suicide (American Psychological Association, 2010; Gone & Trimble, 2012; Sarche & Spicer, 2008). However, the prevalence of behavioral health disparities can vary depending on multiple factors, including age. For instance, in a non-probability sample of 282 older AI/ANs, alcohol consumption was not found to be elevated in comparison with the general population (Barker & Kramer, 1996). Despite variability, statistics generally confirms alarming behavioral health disparities for AI/AN populations. For instance, AI/AN populations have been found to experience serious psychological distress at 1.5 times the rate of the general population (American Psychological Association [APA], 2010). According to the Indian Health Service (2014), AI/AN populations have a 65% higher suicide rate and 4.2 lower life expectancy than the general United States population.

These disparities are particularly disconcerting given the responsibilities delineated in treaty agreements between the US government and sovereign tribes (US Commission on Civil Rights, 2004). Furthermore, it is possible that health disparities accumulate over time. Thus, one segment of the AI/AN population, older adults, are especially vulnerable (Miller-Cribbs, Byers, & Moxley, 2009). However, very little is known about factors associated with behavioral health, including depression, for AI/AN older adults (Brave Heart, Chase, Elkins, & Altschul, 2011; Curyto et al., 1998; Miller-Cribbs et al., 2009). Because this segment of the AI/AN population is projected to double in size between 2012 and 2060 (US Census, 2012), there is a critical need for more research to understand their behavioral health needs. Furthermore, depression among older AI/AN adults is thought to be a critical mental health issue that is complexly related to other AI/AN health disparities and, thus, is essential to understand (Curyto et al., 1998; Miller-Cribbs et al., 2009). Because older AI/AN populations are traditionally respected and revered within their communities, the juxtaposition of the behavioral health disparities is even more important to disentangle.

One of the barriers to health equity has been historical trauma and oppression (Brave Heart et al., 2011; Duran,

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Duran, Brave Heart, & Yellow Horse-Davis, 1998; King, Smith, & Gracey, 2009). Historical oppression includes the pervasive effects of chronic, multi-generational, and internalized experiences of subjugation, including contemporary stressors, such as discrimination and trauma (Burnette, 2014, in press). Since the beginning of colonization in the 16th century, AI/AN populations have experienced historical traumas in the form of widespread disease, extensive warfare, genocide, land dispossession, and boarding school participation among others (Brave Heart et al., 2011). The effects of these traumas persist and are perpetuated through historical oppression, which includes both historical traumas and contemporary oppression, including poverty and discrimination (Burnette, in press); this historical oppression is linked with contemporary behavioral health disparities (Campbell & Evans-Campbell, 2011; LaFromboise, Hoyt, Oliver, & Whitbeck, 2006; Whitbeck, Walls, Johnson, Morrisseau, & McDougall, 2009). Presently, AI/ANs are more likely to experience poverty, violent victimization, traumatic loss, domestic violence, and educational inequities than non-AI/AN populations (Sarche & Spicer, 2008).

Despite these inequities, AI/AN populations have demonstrated resilience in response to centuries of historical trauma, loss, and oppression. Much of the research with these populations, however, has focused on risk factors related to behavioral health problems (Barney, 2001). To offset this problem-focused approach, resilience, or positive adaptation in response to adversity is a useful theoretical framework (Stumblingbear-Riddle & Romans, 2012; Waller, 2001). Adversities, or challenging life experiences, are characterized by risk factors, which increase the probability of negative outcomes (Greene, 2009). Protective factors, in contrast, are associated with positive life outcomes, and buffer the impact of adversity (Greene, 2009). This study introduces the protective factor of social support and the risk factors of adverse childhood experiences (ACE) as significant factors to research on depression among older AI/ANs.

AI/AN tribes have distinct historical contexts, languages, cultures, and social structures. Although there exists some overlap across risk and protective factors of AI/AN and non-AI/AN populations (Barney, 2001; LaFromboise et al., 2006; Yu & Stiffman, 2007), research has identified several culturally distinct factors (LaFromboise et al., 2006; Whitbeck et al., 2009; Yu & Stiffman, 2007). Likewise, AI/AN older adults may perceive concepts such as depression and social support in qualitatively distinct ways (O'Nell, 1996). Because of different perceptions of behavioral health, more research that focuses on AI/AN populations is warranted (Chapleski, Kaczynski, Gerbi, & Lichtenberg, 2004).

Depression among AI/AN older adults

Because it is highly related to suicide, mortality, and health equity more generally, depression is a particularly important behavioral health topic to explore (American Association of Suicidology, 2010; Penninx et al., 1999). Depression is thought to be one of the most frequent causes of emotional distress in later life, impairing the quality of life of older adults in the general population of the United States (Bell et al., 2005; Blazer, 2003). The prevalence of depression among community-dwelling older adults was reported to range from 8% to 16% (Blazer, 2003). Because approximately 66% of those who commit suicide are also depressed at the time of their death, depression is likely an underlying risk factor for suicide (American Association of Suicidology, 2010; Indian Health Service, 2014). In fact, the risk for suicide among people with major depression is around 20 times higher than individuals without a diagnosis of depression (American Association of Suicidology, 2010). Other research has found that depression itself is a risk factor for dying among older persons (Penninx et al., 1999). However, like the majority of research on behavioral health, these rates were based on samples drawn from non-AI/ AN populations (Blazer, 2003; Chapleski et al., 2004).

Although depression among older adults is a common problem in the general population, studies of older AI/AN populations have provided dissimilar prevalence rates (Baker-Demmaray, 2012; John, Kerby, & Hennessy, 2003; O'Nell, 1996). For instance, in an ethnographic study with an AI/AN tribe in Montana, community members reported prevalence for depression as high as 70%−80% (O'Nell, 1996). However, in a national study of 18,078 AI/AN older adults (aged 55 and above), only 13.8% of AI/ANs reported depression (Baker-Demmaray, 2012). In a study of 309 AI/AN elders, approximately 18% had significant levels of depression, which was commensurate with rates among the general population (Curyto et al., 1998). More research is needed to establish accurate prevalence rates. Nonetheless, it appears that rates of depression for older adults vary significantly across AI/AN contexts; localized examinations are needed to reflect this heterogeneity (Gone & Trimble, 2012). Overall, the knowledge base on the behavioral health of AI/AN older adults is severely underdeveloped.

Risk and protective factors for depression

The protective factor of social support and the risk factors of ACE are important but understudied factors within research on depression among older AI/ANs. ACE are major risk factors for adult depression in the general population (Chapman et al., 2004; Felitti, 2002; Honkalampi et al., 2005; Tennant, 2002). ACE can include recurrent physical, sexual, and emotional abuse and neglect, as well as witnessing domestic violence; all of these conditions are robust risk factors for depression in the general population (Chapman et al., 2004; Easton, 2013; Tennant, 2002). ACE are quite common and can have a profoundly negative effect on the wellness of survivors one half of a century after their occurrence (Felitti, 2002). For example, Felitti (2002) reported that those with four or more ACE were 460% more likely to suffer from depression than those who reported no ACE. Furthermore, ACE also increase the risk of suicide (Dube, Anda, Felitti, Edwards, & Williamson, 2002; Felitti, 2002) and violence (Whitfield, Anda, Dube, &

Felitti, 2003), both of which are elevated within AI/AN populations (APA, 2010; Gone & Trimble, 2012; Sarche & Spicer, 2008).

Research on risk and protective factors related to depression among AI/AN is scarce; research on AI/AN depression among older adults is virtually non-existent (Baker-Demmaray, 2012; Chapleski et al., 2004; Curyto et al., 1998; Miller-Cribbs et al., 2009; O'Nell, 1996). One study examined with AI/AN elders found that living in urban areas and educational level were significant predictors of depression (Curyto et al., 1998). Another study found that childhood physical abuse predicted depressive disorders among adult AI/AN from the south-west and northern plains (Libby, Orton, Novins, Beals, & Manson, 2005). In a study with a small sample ($N = 30$) of pregnant AI/AN women from the northern plains, childhood physical and sexual abuse were significantly associated with substance abuse, but not psychiatric problems (Bohn, 2003). Finally, in a study with adults from the Northern Midwest and Canadian First Nation reserves, Walls and Whitbeck (2011) found that childhood and adult (past-year) stressors predicted depression; however, they did not report whether childhood stressors (e.g., exposure to violence) directly predicted depression. With the exception of one study (Bohn, 2003), there is some preliminary support for the relationship between ACE and depression among AI/AN adults. However, none of these studies included AI/AN older adults as participants; more research is clearly needed.

Research has consistently found that social support is a protective factor against depression among older adults in the general population (Blixen & Kippes, 1999; Tennant, 2002). Conversely, loneliness and a lack of social support are concomitant risk factors for behavioral health problems among older adults (Blazer, 2003; Blixen & Kippes, 1999; Curyto et al., 1998; Djernes, 2006; Honkalampi et al., 2005; Newsom & Schulz, 1996; Singh & Misra, 2009; Tennant, 2002). Indeed, loneliness is thought to be one of the main contributors to both depression and suicide (Singh & Misra, 2009). Social support can be provided by both family and friendship contacts, and can include providing emotional support during a challenging time or instrumental support such as offering money for gas (Newsom & Schulz, 1996). Also, age-related losses, such as loss of loved ones or family ties, increase as people age, resulting in increased feelings of loneliness (Singh & Misra, 2009).

Perceived poor health has also been found to be a factor related to depressive symptoms (Chapleski et al., 2004; Honkalampi et al., 2005). Furthermore, comorbidity between health conditions and depression is prevalent (Bell et al., 2005; Goins & Pilkerton, 2010), and people with chronic health conditions, such as diabetes, are at heightened risk for depression (Bell et al., 2005). Despite social support being protective against depression among older adults in the general populations, our literature review did not identify any studies that examined this relationship for AI/AN adults. More research is needed to fill this critical gap in our current knowledge base.

In summary, the research on depression among AI/AN older adults is vastly underdeveloped. Although ACE are major risk factors for depression within the general population, more research is needed to identify their relationship with depression among AI/AN, especially older adults. Because certain types of ACE may have more detrimental effects, it is also important to distinguish their specific relationships with depression. Social support is a protective factor against depression within the general population; however, its role in depression among AI/AN older adults has yet to be delineated. Other factors, such as living alone, perceived health, and demographic variables are also important to account for.

To address these gaps in knowledge, the purpose of this study was to examine risk and protective factors for depression among AI adults aged 50 and older. More specifically, this study examined the ways in which ACE (i.e., childhood abuse, childhood neglect, childhood household dysfunction) and social support were related to depressive symptoms among AI older adults. Two hypotheses guided this investigation: (1) the levels of childhood abuse, childhood neglect, and childhood household dysfunction would be positively related to depressive symptoms and (2) the level of social support would be negatively associated with depressive symptoms. The role of demographic factors (e.g., age, gender, education) and other control variables (e.g., living alone, perceived health) was also examined.

Methods

Sample and data collection

This study used a cross-sectional survey design with convenience sampling of AI older adults in two Midwestern states: South Dakota and Minnesota. Being drawn from non-metro populations with fewer than 50,000 residents (The White House Office of Management and Budget, 2012), the sample could be classified as rural and composed of off-reservation AI older adults. After approval from the Institutional Review Board at the University of South Dakota, participants were recruited through a variety of off-reservation locations including AI churches, social service centers, other religious organizations, senior housing facilities, senior centers, and three powwows. Participants had to self-identify as an AI and be 50 years of age or older to be eligible for the study. The cut-off of 50 years of age was selected given a lower life expectancy of AI older adults (Indian Health Service, 2014). Participants completed a self-administered survey between January and May of 2013 at one of the above locations. While questionnaires were designed to be self-administered, trained interviewers (i.e., AI college students) were available for assistance. Prior to each survey, interviewers explained the purpose and procedures of the study, the kinds of questions that would be asked, confidentiality of data, and participants' rights. All participants gave informed written consent and were offered an incentive of $10. A total of 235 AI older adults participated in the study. Two participants did not complete the questionnaire and were excluded, resulting in a final sample of 233 AI older adults.

Measures

Dependent variable

The Geriatric Depression Scale-Short Form (GDS-SF) was used to measure the dependent variable, depression (Yesavage & Sheikh, 1986). This 15-item measure captures a wide range of depressive symptoms (e.g., 'Do you feel happy?', 'Do you feel your life is empty?', 'Are you in good spirits mostly?') with a yes/no response format. Total scores range from 0 to 15; scores of 0−5 indicate normal, 6−10 indicate mild depression, and 11 or above indicate severe depression. A score of 5 and above is suggested as indicative of probable depression (Yesavage & Sheikh, 1986). Internal consistency was .81 in the current sample. Prior to the analysis, the normality of depressive symptoms was evaluated via standardized skewness scores and probability−probability plots. Due to skewness of the data (i.e., > 1.0), a square-root transformation was applied to depressive symptoms.

Adverse childhood experiences

ACE were defined in this study as any exposure to traumatic situations, chronic stressors, or specific traumatic events before the age of 18. Childhood adversity was measured using the ACE Questionnaire (Dube, Felitti, Dong, Giles, & Anda, 2003; Felitti et al., 1998; Felitti, 2002). This Questionnaire assesses 10 types of childhood adversity among 3 domains of childhood abuse: emotional, sexual, and physical abuse, physical neglect, and abuse associated with living in a dysfunctional household (e.g., witnessing maternal abuse; living with a substance abuser; living with a mentally ill household member; parental loss, such as through divorce; and incarceration of a household member). For each question, participants responded either yes (1) or no (0). The number of endorsed items was then summed to create a total ACE score (range = 0−10). With a value of .78 for internal consistency, the Cronbach's alpha indicated that the instrument was reliable and valid. Based on previous studies (Dube et al., 2003; Felitti et al., 1998), we used three sub-scales: childhood abuse (a = .78), childhood neglect (a = .54), and childhood household dysfunction (a = .54). At .54, the internal consistency of the two sub-scales was relatively low, but reflects the broad content area and the variations in the difficulty of the items.

Social support

The Multidimensional Scale of Perceived Social Support (MSPSS) has been used to measure perceived social support (Zimet, Dahlem, Zimet, & Farley, 1988). It includes 12 items which cover three dimensions: family, friends, and significant others (e.g., 'There is a special person that is around when I am in need', 'My family really tries to help me', 'I can count on my friends when things go wrong'). Each item is rated on a four-point Likert-type response format (1 = strongly disagree; 4 = strongly agree). A total score is calculated by summing responses for all items. The theoretical range is 12− 48 with higher scores meaning higher levels of perceived social support. The internal consistency was .94 in this study.

Control variables

Based on existing research on behavioral health disparities (Sarche & Spicer, 2008), this study used five demographic factors as control variables: age, gender, education, living alone, and perceived health. Two dichotomous variables, 'female' and 'living alone', were coded as 1 (yes) and 0 (no). 'Education' and 'perceived health' were measured at the ordinal level. The variable 'age' was a continuous variable.

Data analysis

Using descriptive statistics and a correlation matrix, this study first examined demographic characteristics and bivariate correlations among the main variables of interest for AI older adults. Next, hierarchical multivariate regression was used to test the two hypotheses which focused on the role of ACE and social support on the dependent variable, depressive symptoms (Mertler & Vannatta, 2009). The tolerance scores for all independent variables were greater than .65, indicating there were no multicollinearity problems in this study (Mertler & Vannatta, 2009).

Results

Sample characteristics

As shown in Table 1, the age of participants ranged from 50 to 95, with a mean of 60.7 years. A little more than half were female and just over one-third were married. Most participants had at least a high school degree/General Educational Development (GED). About one-half of the participants reported an annual income of less than $20,000. Approximately one-fourth of participants (26.1%) lived alone. Regarding ACE, the mean score was 2.6, which means that on average, respondents had been exposed to between two and three ACE. Overall, about 75.6% of respondents had been exposed to at least one type of ACE and 31.8% exposed to four or more types of ACE. That is, only 24.4% of respondents were not exposed to any ACE, much lower than the rate of 36.4% within the general population (Anda et al., 2009). In terms of social support, the mean score was 38.7, indicating that respondents had moderate social support. For depressive symptoms, the mean score was 2.28. Applying the GDS-SF cut points, approximately 8.4% of participants could be classified as mildly depressed; 2.3% of participants could be classified as moderate or severely depressed. The remaining participants (89.3%) could be classified in the normal range for depression (i.e., 0−5 symptoms). In this study, the sample characteristics such as average age, marital status, income, and living arrangement were similar to the characteristics of AI/ANs in a previous national study (Goins & Pilkerton, 2010).

Table 1. Demographic characteristics among American Indian older adults ($N = 233$).

Age, $M(SD)$	Range: 50–95 years	60.7	(8.4)
Gender, n (%)		125	(54.3)
		105	(45.7)
Marital status, n (%)	Married	84	(36.4)
	Never married	41	(17.7)
	Widowed	28	(12.1)
	Divorced	52	(22.5)
	Others (separated etc.)	26	(11.3)
Education, n (%)	Lower than high school diploma/GED	19	(8.3)
	High school diploma/GED	96	(42.3)
	Greater than high school diploma/GED	112	(49.4)
Perceived health, n (%)	Poor or fair	67	(29.0)
	Good or excellent	164	(71.0)
Annual household income, n (%)	Less than $20,000	106	(46.7)
	$20,001–$40,000	53	(23.3)
	More than $40,000	68	(29.9)
Living arrangement, n (%)	Living alone	60	(26.0)
	Living with someone	171	(74.0)
ACE, $M(SD)$	Ranged from 0 to 10	2.6	(2.5)
Childhood abuse, $M(SD)$	Ranged from 0 to 3	.68	(1.0)
Childhood neglect, $M(SD)$	Ranged from 0 to 2	.3	(.6)
Childhood household dysfunction, $M(SD)$	Ranged from 0 to 5	1.6	(1.4)
Social support, $M(SD)$	Ranged from 12 to 48	38.7	(6.9)
Depressive symptoms, $M(SD)$	Ranged from 0 to 13	2.3	(2.8)

Bivariate correlations among all variables

Table 2 presents bivariate correlations among all variables. For main variables, correlation results indicated that there was a positive relationship between each of the three ACE sub-scales and depressive symptoms: childhood abuse ($\beta = .24, p \leq .001$), childhood neglect ($\beta = .33, p \leq .001$), and childhood household dysfunction ($\beta = .29, p \leq .001$). As predicted, there was a negative relationship between social support and depressive symptoms ($\beta = -.35, p \leq .001$).

Role of adverse childhood experience and social support on depressive symptoms

The hierarchical regression results are displayed in Table 3. In step one, demographic variables explained 17.2% of the variance (R^2) in the depressive symptoms. Demographics and ACE in step two accounted for 27.9% of the variance (R^2), an increase of 10.7% from step one. In the final step, demographics, ACE, and social support explained 33.6% of the variance (R^2), an increase of 5.7% from step two.

Higher levels of childhood neglect were related to higher depressive symptoms ($\beta = .279, p \leq .05$). Similarly, childhood household dysfunction was positively associated with depressive symptoms ($\beta = .121, p \leq .05$). Higher social support was associated with lower depressive symptoms ($\beta = -.038, p \leq .001$). Additionally, living alone was significantly related to higher depressive symptoms ($\beta = .368, p \leq .05$). Better perceived health was a significant protective factor for lower depressive symptoms ($\beta = -.242, p \leq .01$).

Table 2. Bivariate correlations among main variables ($N = 233$).

	1	2	3	4	5	6	7	8	9
1. Depressive symptoms	–								
2. Childhood abuse	.24***	–							
3. Childhood neglect	.33***	.50***	–						
4. Childhood household dysfunction	.29***	.48***	.39***	–					
5. Social support	−.35***	−.05	−.06	−.02	–				
6. Age	.11	−.20**	.03	−.22***	−.15*	–			
7. Female	−.01	.12	.01	−.01	.18*	−.06	–		
8. Education	−.14*	.10	.06	.05	.09	−.06	.14*	–	
9. Perceived health	−.27***	−.11	−.05	−.10	.20**	−.05	.03	.11	–
10. Living alone	.02	.02	−.04	−.07	.10	.08	.06	−.05	−.17**

Note: *$p \leq .05$, **$p \leq .01$, ***$p \leq .001$.

Table 3. Coefficients of hierarchical regression for the role of ACE and social support on depressive symptoms of American Indian older adults ($N = 233$).

| | Depressive symptoms | | |
| | B^1 (SE^2) | | |
	Step 1	Step 2	Step 3
Age	.001 (.009)	.008 (.009)	.006 (.024)
Female	.132 (.135)	.164 (.129)	.223 (.125)
Education	−.097 (.080)	−.127 (.075)	−.107 (.073)
Living alone	.571 (.168)***	.477 (.159)**	.368 (.156)*
Perceived health	−.364 (.094)***	−.314 (.089)***	−.242 (.088)**
Childhood abuse		.054 (.075)	.051 (.072)
Childhood neglect		.298 (.123)*	.279 (.119)*
Childhood household dysfunction		.131 (.052)*	.121 (.051)*
Social support			−.038 (.010)***
F test	7.366***	8.410***	9.711***
R^2 total	.172	.279	.336
Adjusted R^2 total	.149	.246	.301

Notes: *$p \leq .05$, **$p \leq .01$, ***$p \leq .001$.
[1]Standardized Beta coefficients.
[2]Standard errors.

Discussion

The purpose of this study was to examine the relationship between ACE, social support, and depressive symptoms among AI adults aged 50 and older. As predicted, ACE and social support were both related to depressive symptoms in the expected directions. Furthermore, two ACE sub-scales − childhood neglect and childhood household dysfunction − were related to depressive symptoms in the hierarchical models. Two of the control variables, living alone and perceived health, were also related to the dependent variable.

The results of this study indicate that ACE can have profound effects across the life course and into old age (Libby et al., 2005; Walls & Whitbeck, 2011). Some research has documented the negative effects of ACE on AI/AN youth populations (Libby et al., 2005; Yu & Stiffman, 2007). Few studies have examined ACE with respect to the behavioral health of older adults generally; even fewer studies have investigated the effects of ACE for older AI/AN. This study was one of the first to extend the general findings on the potentially harmful effects of ACE to this under-researched, vulnerable population. As such, the importance of preventing ACE generally, and within the AI/AN communities, in particular, cannot be overstated.

A noteworthy finding was that child neglect and household dysfunction predicted depressive symptoms, whereas child abuse did not. One possible explanation centers about the particular importance of connectedness (Hill, 2009; Mohatt, Fok, Burket, Henry, & Allen, 2011) and family in many AI communities (Barney, 2001; Sarche & Spicer, 2008). With strong bonds between family members, the contextual and familial environment may impact individuals to a greater degree than experiencing direct abuse. Additionally, our results are consistent with another study that found that parental behavioral health problems and substance abuse (i.e.,

household dysfunction) were predictive of depression among AI (Libby et al., 2005). Because household dysfunction includes witnessing intimate partner violence (IPV), which has reached alarming levels in some AI communities (Greenfield & Perry, 2004; Tjaden & Thoennes, 2000), the ripple effects of IPV on children and families across generations are likely substantial. Our study was one of the first studies to examine the differential effects of ACE on older AI adults. However, more research that delineates the different effects of child neglect, abuse, and household dysfunction on behavioral health for older AI adults is warranted.

Although the level of ACE were relatively high and related to depressive symptoms in this study, it is important to note that the actual level of depressive symptoms within this sample was relatively low. The mean score 2.28 of respondents was less than the mean score of 3.72 for older adults in assisted living facilities (Lee, Besthorn, Bolin, & Jun, 2012), but was slightly higher than the mean score of 2.1 for older African American women (Pedraza, Dotson, Willis, Graff-Radford, & Lucas, 2009). To assess whether the findings explained small differences in affect among participants with no or few depressive symptoms, post-hoc analyses were conducted in which we re-ran correlations after removing participants who had a score of 5 or higher on depressive symptoms. As expected, all of the correlations decreased. Although they did not drop to zero, the decreases provided evidence to rule out the possibility of explaining minor differences among participants with few or no depressive symptoms.

There are several possible explanations for the relatively low scores on depressive symptoms in this study. First, other research reflects heterogeneity in the prevalence of depression across AI/AN populations (Gone & Trimble, 2012). This heterogeneity has been typically

depicted in relationship to differences across distinct tribes. However, within population differences related to age are also possible. Second, because AI/AN populations may perceive behavioral health and depressive symptoms more holistically and in qualitatively distinct ways than the general population (O'Nell, 1996), the measure of depressive symptoms used in this study may not have been culturally sensitive enough to capture all of the depressive symptoms for AI/AN. Although great efforts were made to collect data in a manner that was respectful of AI culture, it is also possible that participants were reluctant to provide sensitive information to non-AI researchers. Third, the fact that most participants in the study could be classified in the 'normal' range for depression scores, despite the majority experiencing ACE, could be considered evidence of resilience; AI older adults may be resistant to depressive symptoms. Social support, for example, could be an important buffer against the negative impact of ACE. However, more research is needed to evaluate resiliency with this population (Barney, 2001) and, by extension, disentangle the possible mechanisms and sources of strength indigenous to AI/AN.

The results of this study also confirmed the beneficial effects of social support on depressive symptoms for AI/AN. Interestingly, the mean score of 38.69 was higher than the mean score for older Korean Americans (35.20; Roh, Lee, & Yoon, 2013) and for American older adults in rural areas (33.8; Yoon & Lee, 2007). Also, the protective effect of social support within this sample was relatively high in comparison with non-AI samples in other research (Roh et al., 2013). Moreover, social support may be especially protective for AI older adults, given the importance of connectedness (Hill, 2009; Mohatt et al., 2011) and family and community support in AI/AN subpopulations (Sarche & Spicer, 2008). The protective effects of social support, and their potential to prevent depression in older adults, should be investigated further. AI/AN populations report family as being foundational and integral for their support (Burnette, 2013). Thus, in addition to formal interventions, strengthening existing social and family supports are important areas to explore in the prevention and treatment of depression among AI older adults.

By bolstering healthy families and preventing child abuse, neglect, and violence in homes, behavioral health problems that can occur across the life course may be reduced or prevented. Likewise, improving existing social networks and supports of AI older adults is an important preventative measure. Identifying ways to connect AI older adults, despite functional limitations or institutional living, should be a central aim of future intervention research. With family often being central to social support, investigating the potential of multigenerational households to add social support is also another important area to explore.

Limitations

In addition to the cross-sectional design, this study had several limitations that should be acknowledged. The first limitation is associated with the data-collection method: a self-report survey. There is a risk that participants provided answers that they considered to be socially desirable and that were not indicative of their true feelings or knowledge level. Second, the use of a non-probability sample from two midwestern states limits the extent to which findings can be generalized to AI older adults elsewhere. Also, data on tribal membership was not collected. Selection biases might also have affected the findings. The level of depression and ACE among those who are homebound or institutionalized might be different from those who are actively involved in senior centers, powwows, and other social service centers. Studies with more representative samples of AI older adults generally (and also across different tribes and rural/urban contexts) will provide a fuller picture of physical and behavioral health effects, thereby advancing our gerontological knowledge base. Third, our models did not include some other common risk factors for depression (e.g., loneliness, chronic health problems); future studies could build on our results and examine their relationship to ACE, social support and depression.

Last, the reliability of the instruments used in this study should be further examined with AI older adults. For example, culture and ACE are inextricably interwoven together; the reporting accuracy of ACE may vary due to individuals' background (e.g., age, gender, race) or culture (Easton, 2012). Also, some depression scales, such as the Center for Epidemiological Studies Depression Scale, have been found to be conceptually valid in an AI population in the great region (Chapleski, Lamphere, Kaczynski, Lichtenberg, & Dwyer, 1997). However, the validity of the GDS has not yet been evaluated with AI/AN populations. Furthermore, the MSPSS has not yet been validated with AI/AN older adults; this research is needed, since social support may be perceived in distinct ways for AI/AN who embrace a more collective social structure. More research is needed to develop culturally sensitive, empirically validated instruments to measure depression, ACE and social support among AI/AN populations, including older adults.

Future research

With the absence of research on depression among AI older adults, numerous avenues for future research are evident. Although social support and ACE were significant protective and risk factors related to depression among AI older adults in this study, other risk and protective factors may explain variance in behavioral health outcomes. Therefore, it is important to examine the possibility of culturally specific risk and protective factors relevant to depression among AI older adults. For example, historical loss (Whitbeck et al., 2009) and perceived discrimination (Whitbeck et al., 2009) have been found to be predictive of depressive symptoms in some AI/AN populations. However, these risk factors have yet to be extended to AI older adults. Moreover, ethnic identity (Yoder, Whitbeck, Hoyt, & LaFromboise, 2006) and commitment to cultural spirituality (Garroutte, Goldberg,

Beals, Herrell, & Manson, 2003) were protective against suicide attempts among AI/AN youth, but these factors need to be explored further among older adults.

Additionally, AI older adults may perceive behavioral health in more holistic ways than the general population (University of Maryland Center for School Mental Health, 2011). More research about the cultural relevancy of measures developed on non-AI populations is needed. Also, research that compares the rates of depression in AI older adults across differing tribes and contexts is needed (Curyto et al., 1998). To address heterogeneity across tribes and contexts, Gone and Trimble (2012) suggested localized examinations of AI/AN behavioral health. It is entirely possible that due to unique histories and cultural roots, there may be different predictors of depression between various tribes. Similarly, rural and urban AI populations may have different rates and predictors of depression. Thus, future examinations of AI/AN older adults that explore these issues (e.g., rural/urban, tribal membership, on-reservation/off-reservation, living independently/assisted living) may uncover important contextual factors related to depression for these populations, thereby improving our capacity for effective, customized interventions.

Finally, research focusing on enhancing existing strengths, such as social support, among AI populations can identify pathways that could reduce existing behavioral health disparities. Qualitative research could enable greater understanding of the factors that account for resilience and the ways that social support may bolster behavioral health among AI/AN older adults. Overall, research that increases our understanding of protective factors (and identifies mechanisms that enhance the capacities of AI/AN older adults) will be instrumental in the efforts to reach the goals of Healthy People 2020, including health equity.

References

American Association of Suicidology. (2010). Some facts about suicide and depression. Retrieved from http://www.suicidology.org/c/document_library/get_file?folderId=232&name=DLFE-246.pdf

American Psychological Association. (2010). APA fact sheet, mental health disparities: American Indian and Alaska Natives. Retrieved from http://www.psych.org/Share/OMNA/Mental-Health-Disparities-Fact-Sheet–American-Indians.aspx

Anda, R.F., Dong, M., Brown, D.W., Felitti, V.J., Giles, W.H., Perry, G.S., ... Dube, S.R. (2009). The relationship of adverse childhood experiences to a history of premature death of family members. *BMC Public Health, 9*(1), 106−115.

Baker-Demmaray, T. (2012). *Mental health and social engagement among American Indian elders*. (Unpublished doctoral dissertation). University of North Dakota, North Dakota. Retrieved from ProQuest Dissertations and Theses database (UMI No. 3587405).

Barker, J.C., & Kramer, B. (1996). Alcohol consumption among older urban American Indians. *Journal of Studies on Alcohol and Drugs, 57*(2), 119−124.

Barney, D.D. (2001). Risk and protective factors for depression and health outcomes in American Indian and Alaska Native adolescents. *Wicazo Sa Review, 16*(1), 135−150.

Bell, R.A., Smith, S.L., Arcury, T.A., Snively, B.M., Stafford, J. M., & Quandt, S.A. (2005). Prevalence and correlates of depressive symptoms among rural older African Americans, Native Americans, and whites with diabetes. *Diabetes Care, 28*(4), 823−829.

Blazer, D.G. (2003). Depression in late life: Review and commentary. *The Journals of Gerontology Series A: Biological Sciences and Medical Sciences, 58*(3), M249−M265.

Blixen, C.E., & Kippes, C. (1999). Depression, social support, and quality of life in older adults with osteoarthritis. *Journal of Nursing Scholarship, 31*(3), 221−226.

Bohn, D.K. (2003). Lifetime physical and sexual abuse, substance abuse, depression, and suicide attempts among Native American women. *Issues in Mental Health Nursing, 24*(3), 333−352.

Brave Heart, M.Y.H., Chase, J., Elkins, J., & Altschul, D.B. (2011). Historical trauma among indigenous peoples of the Americas: Concepts, research, and clinical considerations. *Journal of Psychoactive Drugs, 43*(4), 282−290.

Burnette, C.E. (2013). *Unraveling the web of intimate partner violence (IPV) with women from one Southeastern tribe: A critical ethnography*. (Unpublished doctoral dissertation). University of Iowa, Iowa. Retrieved from http://ir.uiowa.edu/etd/2449

Burnette, C.E. (2014). From the ground up: Indigenous women's after violence experiences with the formal service system in the United States. *British Journal of Social Work*. doi:10.1093/bjsw/bcu013

Burnette, C.E. (in press). Disentangling Indigenous women's experiences with intimate partner violence in the United States. *Critical Social Work*.

Campbell, C.D., & Evans-Campbell, T. (2011). Historical trauma and Native American child development and mental health: An overview. In P. Spicer & P. Farrell (Eds.), *American Indian children and mental health: Development, context, prevention and treatment* (pp. 1−26). Westport, CT: Greenwood.

Chapleski, E.E., Kaczynski, R., Gerbi, S.A., & Lichtenberg, P.A. (2004). American Indian elders and depression: Short- and long-term effects of life events. *Journal of Applied Gerontology, 23*(1), 40−57.

Chapleski, E.E., Lamphere, J.K., Kaczynski, R., Lichtenberg, P. A., & Dwyer, J.W. (1997). Structure of a depression measure among American Indian elders: Confirmatory factor analysis of the CES-D scale. *Research on Aging, 19*(4), 462−485.

Chapman, D.P., Whitfield, C.L., Felitti, V.J., Dube, S.R., Edwards, V.J., & Anda, R.F. (2004). Adverse childhood experiences and the risk of depressive disorders in adulthood. *Journal of Affective Disorders, 82*(2), 217−225.

Curyto, K.J., Chapleski, E.E., Lichtenberg, P.A., Hodges, E., Kaczynski, R., & Sobeck, J. (1998). Prevalence and prediction of depression in American Indian elderly. *Clinical Gerontologist, 18*(3), 19−37.

Djernes, J. (2006). Prevalence and predictors of depression in populations of elderly: A review. *Acta Psychiatrica Scandinavica, 113*(5), 372−387.

Dube, S.R., Anda, R.F., Felitti, V.J., Edwards, V.J., & Williamson, D.F. (2002). Exposure to abuse, neglect, and household dysfunction among adults who witnessed intimate partner violence as children: Implications for health and social services. *Violence and Victims, 17*(1), 3−17.

Dube, S.R., Felitti, V.J., Dong, M., Giles, W.H., & Anda, R.F. (2003). The impact of adverse childhood experiences on health problems: Evidence from four birth cohorts dating back to 1900. *Preventive Medicine, 37*(3), 268−277.

Duran, E., Duran, B., Brave Heart, M.Y.H., & Yellow Horse-Davis, S. (1998). Healing the American Indian soul wound. In Y. Danieli (Ed.), *International handbook of multigenerational legacies of trauma* (pp. 341−354). New York, NY: Plenum Press.

Easton, S.D. (2012). Understanding adverse childhood experiences (ACE) and their relationship to adult stress among male survivors of childhood sexual abuse. *Journal of Prevention & Intervention in the Community, 40*(4), 291−303.

Easton, S.D. (2013). Masculine norms, disclosure, and childhood adversities predict long-term mental distress among men with histories of child sexual abuse. *Child Abuse & Neglect*. doi:org/10.1016/j.chiabu.2013.08.020

Felitti, M., Vincent, J., Anda, M., Robert, F., Nordenberg, M., Williamson, M., ... Edwards, B. (1998). Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults: The adverse childhood experiences (ACE) study. *American Journal of Preventive Medicine, 14*(4), 245−258.

Felitti, V.J. (2002). The relationship of adverse childhood experiences to adult health: Turning gold into lead. *Zeitschrift Fur Psychosomatische Medizin Und Psychotherapie, 48*(4), 359−369.

Garroutte, E.M., Goldberg, J., Beals, J., Herrell, R., & Manson, S.M. (2003). Spirituality and attempted suicide among American Indians. *Social Science & Medicine, 56*(7), 1571−1579.

Goins, R.T., & Pilkerton, C.S. (2010). Comorbidity among older American Indians: The native elder care study. *Journal of Cross-Cultural Gerontology, 25*(4), 343−354.

Gone, J.P., & Trimble, J.E. (2012). American Indian and Alaska Native mental health: Diverse perspectives on enduring disparities. *Annual Review of Clinical Psychology, 8*, 131−160.

Greene, R.R. (2009). Risk and resilience theory: A social work perspective. In R.R. Greene (Ed.), *Human behavior theory & social work practice* (3rd ed., pp. 315−434). Piscataway, NJ: Aldine Transaction.

Greenfield, L.A., & Perry, S.W. (2004). *American Indians and crime :A BJS statistical profile, 1992−2002.* (No. NCJ 203097). Washington, DC: US Department of Justice, Office of Justice Programs.

Hill, D.L. (2009). Relationship between sense of belonging as connectedness and suicide in American Indians. *Archives of Psychiatric Nursing, 23*(1), 65−74.

Honkalampi, K., Hintikka, J., Haatainen, K., Koivumaa-Honkanen, H., Tanskanen, A., & Viinamäki, H. (2005). Adverse childhood experiences, stressful life events or demographic factors: Which are important in women's depression? A 2-year follow-up population study. *Australian and New Zealand Journal of Psychiatry, 39*(7), 627−632.

Indian Health Service. (2014). Indian health service fact sheets: Indian health disparities. Retrieved from http://www.ihs.gov/newsroom/factsheets/disparities/

John, R., Kerby, D.S., & Hennessy, C.H. (2003). Patterns and impact of comorbidity and multimorbidity among community-resident American Indian elders. *The Gerontologist, 43*(5), 649−660.

King, M., Smith, A., & Gracey, M. (2009). Indigenous health part 2: The underlying causes of the health gap. *The Lancet, 374*(9683), 76−85.

LaFromboise, T.D., Hoyt, D.R., Oliver, L., & Whitbeck, L.B. (2006). Family, community, and school influences on resilience among American Indian adolescents in the upper Midwest. *Journal of Community Psychology, 34*(2), 193−209.

Lee, K.H., Besthorn, F.H., Bolin, B.L., & Jun, J.S. (2012). Stress, spiritual, and support coping, and psychological well-being among older adults in assisted living. *Journal of Religion & Spirituality in Social Work: Social Thought, 31*(4), 328−347.

Libby, A.M., Orton, H.D., Novins, D.K., Beals, J., & Manson, S.M. (2005). Childhood physical and sexual abuse and subsequent depressive and anxiety disorders for two American Indian tribes. *Psychological Medicine, 35*(3), 329−340.

Mertler, C.A., & Vannatta, R.A. (2009). *Advanced and multivariate statistical methods: Practical application and interpretation* (4th ed.). Los Angeles, CA: Pyrczak Publishing.

Miller-Cribbs, J., Byers, L., & Moxley, D. (2009). Serving older Native Americans: Challenges facing gerontological social work in Indian country. *Journal of Ethnic & Cultural Diversity in Social Work, 18*, 261−275.

Mohatt, N.V., Fok, C.C.T., Burket, R., Henry, D., & Allen, J. (2011). Assessment of awareness of connectedness as a culturally-based protective factor for Alaska Native youth. *Cultural Diversity and Ethnic Minority Psychology, 17*(4), 444.

Newsom, J.T., & Schulz, R. (1996). Social support as a mediator in the relation between functional status and quality of life in older adults. *Psychology and Aging, 11*(1), 34−44.

O'Nell, T.D. (1996). *Disciplined hearts: History, identity and depression in an American Indian community*. Berkeley, CA: University of California Press.

Pedraza, O., Dotson, V.M., Willis, F.B., Graff-Radford, N.R., & Lucas, J.A. (2009). Internal consistency and test-retest stability of the geriatric depression scale-short form in African American older adults. *Journal of Psychopathology Behavioral Assessment, 31*(4), 412−416.

Penninx, B.W., Geerlings, S.W., Deeg, D.J., van Eijk, J., van Tilburg, W., & Beekman, A.T. (1999). Minor and major depression and the risk of death in older persons. *Archives of General Psychiatry, 56*(10), 889.

Roh, S., Lee, K.H., & Yoon, D.P. (2013). General well-being of Korean immigrant elders: The significance of religiousness/spirituality and social support. *Journal of Social Service Research, 39*(4), 483−497.

Sarche, M., & Spicer, P. (2008). Poverty and health disparities for American Indian and Alaska Native children. *Annals of the New York Academy of Sciences, 1136*(1), 126−136.

Singh, A., & Misra, N. (2009). Loneliness, depression and sociability in old age. *Industrial Psychiatry Journal, 18*(1), 51−55.

Stumblingbear-Riddle, G., & Romans, J.S. (2012). Resilience among urban American Indian adolescents: Exploration into the role of culture, self-esteem, subjective well-being, and social support. *American Indian and Alaska Native Mental Health Research: The Journal of the National Center, 19*(2), 1−19.

Tennant, C. (2002). Life events, stress and depression: A review of recent findings. *Australian and New Zealand Journal of Psychiatry, 36*(2), 173−182.

The White House Office of Management and Budget. (2012). *Defining the rural population*. Retrieved from http://www.hrsa.gov6 ruralhealth6 policy6 definition of_rural.html

Tjaden, P., & Thoennes, N. (2000). *Extent, nature, and, consequences of intimate partner violence*. (Research Report No. NCJ 181867). Washington, DC: US Department of Justice, Office of Justice Programs.

University of Maryland Center for School Mental Health. (2011). *Promoting wellness in American Indian youth*. Baltimore, MD: University of Maryland School of Medicine.

US Census (2012). U.S. census bureau projections show a slower growing, older, more diverse nation a half century from now. Retrieved from https://www.census.gov/newsroom/releases/archives/population/cb12-243.html

US Commission on Civil Rights. (2004). *Native American health care disparities briefing: Executive summary*. Washington, DC: US Commission on Civil Rights.

US Department of Health and Human Services. (2013). Healthy people 2020. Retrieved from http://www.cdc.gov/nchs/healthy_people/hp2020.htm

Waller, M.A. (2001). Resilience in ecosystemic context: Evolution of the concept. *American Journal of Orthopsychiatry, 71*(3), 290−297.

Walls, M.L., & Whitbeck, L.B. (2011). Distress among indigenous North Americans generalized and culturally relevant stressors. *Society and Mental Health, 1*(2), 124−136.

Whitbeck, L.B., Walls, M.L., Johnson, K.D., Morrisseau, A.D., & McDougall, C.M. (2009). Depressed affect and historical loss among North American indigenous adolescents. *American Indian and Alaska Native Mental Health Research, 16* (3), 16−41.

Whitfield, C.L., Anda, R.F., Dube, S.R., & Felitti, V.J. (2003). Violent childhood experiences and the risk of intimate partner violence in adults assessment in a large health maintenance organization. *Journal of Interpersonal Violence, 18* (2), 166−185.

Yesavage, J.A., & Sheikh, J.I. (1986). Geriatric depression scale (GDS) recent evidence and development of a shorter violence. *Clinical Gerontologist, 5*(1−2), 165−173.

Yoder, K.A., Whitbeck, L.B., Hoyt, D.R., & LaFromboise, T. (2006). Suicidal ideation among American Indian youths. *Archives of Suicide Research, 10*(2), 177−190.

Yoon, D.P., & Lee, E.O. (2007). The impact of religiousness, spirituality, and social support on psychological well-being among older adults in rural areas. *Journal of Gerontological Social Work, 48*(3/4), 281−298.

Yu, M., & Stiffman, A.R. (2007). Culture and environment as predictors of alcohol abuse/dependence symptoms in American Indian youths. *Addictive Behaviors, 32*(10), 2253−2259.

Zimet, G.D., Dahlem, N.W., Zimet, S.G., & Farley, G.K. (1988). The multidimensional scale of perceived social support. *Journal of Personality Assessment, 52*(1), 30−41.