Suicide Ideation and the Association of Chronic Disease among American Indians

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Objective: To explore associations of chronic disease, perceived wellness, adverse experiences, and suicide ideation among American Indians.

Methods: Thirteen California health clinic registries formed the random household survey sampling frame (N=459) during the first stage of an intervention trial on wellness. Measures included sociodemographics, wellness status, health conditions, suicide ideation, cultural connectivity (speaking tribal language, participating in cultural practices, and feeling connected to the community), and history of physical, sexual, verbal abuse and neglect in childhood, adolescence, and adulthood. Chi square and Fisher exact tests examined bivariate, unadjusted relationships, while multiple logistic regression analysis examined adjusted associations.

Results: Adverse experiences, specifically physical abuse and sexual abuse, were associated with obesity in childhood. Having poor cultural connectivity was significantly associated with (1) low perceptions of wellness; (2) physical abuse in childhood and adolescence; (3) sexual abuse in childhood, adolescence, and adulthood; and (4) verbal abuse and neglect in adulthood. Poor perception of wellness was also correlated with suicide ideation.

Conclusions: The relationships between suicide ideation, chronic disease, connectivity, and perception of wellness among American Indians are explored in this article. *Ethn Dis.* 2023;33(4):150–155; doi:10.18865/ed.33.4.150

Keywords: American Indian; Obesity; Suicide Ideation; Cultural Connectivity; Adverse Events

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Introduction

Obesity is a chronic illness of national concern and is an increasing health problem among many minority populations, specifically American Indians and Alaska Natives. Nationally, the 2017-2020 obesity rate among adults is 41.9%, lower than that reported for Blacks (49.9%) and for Hispanics (45.6%).[1] Obesity rates for American Indian and Alaska Native adults are more alarming as the Office of Minority Health reports that "American Indians or Alaska Natives are 50 percent more likely to be obese than non-Hispanic whites."[2]

Since the era of colonization over 500 years ago, health problems among American Indians and Alaska Natives have shifted from acute to chronic conditions. Problems of dysentery and smallpox have been replaced by chronic physical problems such as obesity, largely due to changing diets and sedentary lifestyles. The increasing prevalence of obesity over the decades has led to an epidemic of type 2 diabetes, high blood pressure, and heart disease.[3] In addition, mental health problems such as depression and suicide ideation are on the rise and may be partially attributable to intergenerational trauma and stressors experienced by American Indians over the past generations.

In addition to the rising problem of obesity, suicide ideation is rapidly becoming a serious concern in many communities. Suicide was reported to be the 12th leading cause of death in the United States and the second leading cause of death for ages 10-14 years and 25-34 years in 2020.[4] Nationally, suicide is most common among young men. In the present day, suicide is a significant problem among the younger age group of American Indians. Suicide among males aged 15-24 years was reported to be more than double that reported for non-Hispanic White males in 2018 (crude rate of 60.7 compared to 27.3 per 100,000, respectively).[5]

Examining suicide ideation among American Indians through the lens of culture and trauma-related experiences may bring about a better understanding of the impact of abuse experienced over the lifespan. Trauma experienced through generations of families, who have endured various forms of abuses and reports of genocide at the hands of federal soldiers and policies enacted to assimilate American Indians, can be passed down through families and communities.[6] The effects of historical trauma include the loss of land, people, traditional family structures, child-rearing practices, and issues with self-identity. The resulting loss of cultural strengths such as language, religiosity, ceremonial practices, and community support may have led to groups who now suffer from abuse in childhood, adolescence, and adulthood and resulting suicide ideation.

Many factors can increase the risk for suicide ideation and suicide completion. Individuals who experience

various forms of trauma can have a higher risk of suicide.[7,8] Also, chronic health problems can also be associated with suicide ideation. Protective factors are thought to include supportive families, community support, and having access to health care services.[9] The relationship between thoughts of suicide and chronic disease is an important area of investigation, providing potential avenues for intervention and education.

Background

This study was funded by the National Institutes of Health/National Institute for Nursing Research. The purpose of the study was to design, implement, and evaluate a culturally appropriate community-based health care model for American Indian families and set the stage for assessing adverse events experienced in childhood, adolescence, and adulthood among American Indians. The specific aims of the Wellness Circles Project were to (1) assess the environmental influences, barriers, cultural constraints, isolation, and health status of American Indians; (2) assess their health care usage; (3) identify health-related priorities; and (4) increase prevention practices or knowledge, attitude, and behavior among American Indians living in California's rural areas. The project was coordinated in 3 major phases—needs assessment, Wellness Intervention Program, and evaluation. This article focuses on the findings from the needs assessment phase.

As of 2020, approximately 631,000 American Indians live in areas served by rural Indian health clinics in California.[10] The Indian Health Service reports that 109 tribes and 66 health care clinics are located in California. Eight metropolitan sites in cities encompass large urban Indian population groups. Most American Indians use Indian clinic services for their health care, thus Indian clinics were selected to recruit participants in this study.

Methods

Design and Sample

A cross-sectional randomized household survey was implemented. Fifteen health care clinic sites were approached and 13 agreed to participate in the study. Households of American Indian clients were randomly selected, and an adult American Indian member of participating households self-administered the study questionnaire. Inclusion criteria included (1) age 18 years or older, (2) self-identified American Indian, (3) active client of the local Indian health care clinic within the past 5 years, and (4) member of the selected study household. Five hundred adult American Indians from 13 sites were invited to participate and 459 formed the final study sample.

Recruitment

Adult American Indian residents of randomized households were contacted by telephone call or postal mailing, inviting their participation in the study. The nature and purpose of the study were shared in the telephone calls and mailings during the recruitment phase. Care was taken to fully inform each adult recruited that their involvement in the study was voluntary and confidential. Site collaboration and agreements were obtained from the participating Indian health care clinics and tribes at the sites. Institutional review board approvals were obtained from the University of California. Participant consent was obtained according to the Protection of Human Subjects Protocol approved by the sponsoring university. Active informed consent was obtained from all participants included in the study.

Data Collection

A 60-item questionnaire was constructed from the Behavioral Risk Factor Surveillance System,[11] which was modified to include items relating to abuse (physical, sexual, and mental/emotional), neglect, and suicide ideation. Other items collected included sociodemographics, health status and conditions, and tribal identity (affiliation and blood quantum). All participants completed the survey in person, either in their home or at the local Indian health care clinic community meeting room.

Measures

The questionnaire measured the following.

Sociodemographic Characteristics

Data on sex, tribal affiliation, degree of Indian blood (<25%, 25%, 50%, 75%, and 100%), employment, income (annual average before taxes), and educational attainment (<high-school degree and ≥high-school degree) were collected. Age was calculated as a continuous variable and was grouped into cohorts (18-24, 25-39, 40-54, and 55+ years). Marital status was dichotomized into married (or living with someone) and single (divorced/separated/widowed/single).

Perceived General Health

Participants were asked, "In general, would you say your health is: excellent, very good, good, fair or poor?" This measure was categorized by participant response (very good = excellent/very good, good, and poor = fair/poor).

Perceived Wellness Status

Participants were asked, "Wellness includes feeling good and taking care of yourself physically, emotionally, mentally, and spiritually. How would you rate your own wellness: excellent, good, fair, or poor?" This measure was categorized into 2 groups (good = excellent/good and poor = fair/poor).

Trauma and Adverse Events

Measures included a self-reported history of physical, sexual, verbal abuse and neglect in childhood, adolescence, and adulthood.

Table 1. Associations between childhood abuse and adult obesity

Type of abuse/neglect	BMI (<25)	BMI (25-29.9)	BMI (30-39.9)	BMI (40+)	P value
Child	% (n)	% (n)	% (n)	% (n)	
Verbally abused as child	17.80 (21)	22.77 (23)	29.14 (44)	29.55 (13)	.14
Physically abused as child[a]	10.00 (12)	17.00 (17)	16.77 (26)	29.79 (14)	.02
Sexually abused as child[a]	11.97 (14)	8.00 (8)	15.89 (24)	26.09 (12)	.02
Neglected as child	10.83 (13)	18.63 (19)	18.83 (29)	24.44 (11)	.14
Adolescent					
Verbally abused as adolescent	25.71 (27)	24.71 (21)	31.54 (41)	34.29 (12)	.54
Physically abused as adolescent	10.71 (12)	11.46 (11)	10.64 (15)	25.64 (10)	.07
Sexually abused as adolescent	8.04 (9)	8.00 (8)	10.45 (14)	22.5 (9)	.06
Neglected as adolescent	15.45 (17)	18.48 (17)	18.66 (25)	31.58 (12)	.18
Adult					
Verbally abused as adult	35.59 (42)	29.41 (30)	35.33 (53)	43.48 (20)	.41
Physically abused as adult	19.01 (23)	20.79 (21)	17.53 (27)	25.58 (11)	.68
Sexually abused as adult	6.67 (8)	6.73 (7)	12.50 (19)	15.56 (7)	.14
Neglected as adult	11.21 (13)	10.53 (10)	16.33 (24)	17.07 (7)	.44

BMI, body mass index

[a] Represents a statistical significance level of <.05

Cultural Connectivity

A 3-item metric measured cultural connectivity (speaking their tribal language, participating in American Indian practices, and feeling connected to their community). Each positive response to an item received a score of 1, with a total possible score of 3.

Suicide Ideation

Participants were asked if they have had thoughts of committing suicide at some time in their life. A positive response received a score of 1, a negative score was assigned 0.

Health Problems

Participants were asked if they have health problems including type 2 diabetes, cancer, heart disease, high blood pressure, and obesity (body mass index [BMI] scores were calculated from reported height and weight scores; see Table 1).

Data Analysis

To analyze the prevalence of suicide ideation and select categories, chi-square and Fisher exact tests examined bivariate and unadjusted correlations, while multiple logistic regression analysis examined adjusted associations. Differences among select categories were studied under the broad classes of sociodemographics, obesity (BMI), suicide ideation, abuse and neglect, health problems, health status, wellness status, and cultural connectivity. Chi-square tests assessed statistical differences between categorical variables by suicide ideation status, whereas generalized linear models were used to assess the differences in continuous outcomes by suicide ideation status and by obesity status. All statistical analyses were conducted by using SAS version 9.4 (SAS Institute Inc).[12]

Results

Demographic Characteristics

The sample of 459 American Indian adults in California consisted of 74% females and 26% males. The average age was 44.79 (SD=15.88) years, ranging from 19 years to 1 person who was 100 years old. Twenty-two percent (n=96) had less than a high school education and almost 63% (n=275) were employed. The average annual household income was $26,049 (SD=$37,752) and 48% (n=211) were single, separated, divorced, or widowed; the remainder (52%, n=232) were married or living together. A large percentage were enrolled in a tribe (87%, n=371) and 65% (n=197 of 305 with blood data) had 50% or more Indian blood quantum.

Suicide Ideation and Abuse

Twenty percent of 436 participants reported that they had thoughts of committing suicide at some time in their life. Of these, 17.7% were male and 21.4% were female. Young adults, aged 25-34 years, were the largest cohort that reported suicide ideation (26.9%), followed by the group aged 35-44 years (21.7%), the group aged 45-54 years (12.3%), and the group aged 55 years and older (12.3%). The youngest cohort (aged 18-24 years) reported a low suicide ideation at 11.6%. Eight percent of the respondents reported that they had attempted suicide.

Four hundred twenty-six of 459 participants in the sample (93% response

Table 2. Associations between type of abuse/neglect, suicide ideation, and cultural connectiveness among American Indian adults

Type of abuse/neglect	Yes suicide ideation % (n)	No suicide ideation % (n)	P value	Culturally connected % (n)	Culturally not connected % (n)	P value
Physical abuse as a child	33.72 (9)	11.18 (36)	<.0001	14.43 (44)	26.23 (16)	.02
Physical abuse as an adolescent	26.25 (21)	8.42 (25)	<.0001	10.11 (28)	20.00 (12)	.03
Physical abuse as an adult	34.15 (28)	15.43 (50)	<.0001	17.86 (55)	25.42 (15)	.18
Sexual abuse as a child	35.80 (29)	8.72 (28)	<.0001	10.23 (31)	28.81 (17)	.0001
Sexual abuse as an adolescent	24.36 (19)	7.07 (21)	<.0001	7.17 (20)	19.30 (11)	.004
Sexual abuse as an adult	23.81 (20)	6.15 (20)	<.0001	7.47 (23)	18.33 (11)	.008
Verbal abuse as a child	47.56 (39)	18.18 (58)	<.0001	22.41 (67)	27.42 (17)	.39
Verbal abuse as an adolescent	54.05 (40)	21.40 (58)	<.0001	26.29 (66)	32.14 (18)	.37
Verbal abuse as an adult	59.52 (50)	28.13 (90)	<.0001	31.77 (95)	47.62 (30)	.02
Feel repeatedly neglected as a child	36.05 (31)	11.84 (38)	<.0001	15.46 (47)	24.19 (15)	.09
Feel repeatedly neglected as an adolescent	36.36 (28)	13.64 (39)	<.0001	16.17 (43)	30.00 (18)	.01
Feel repeatedly neglected as an adult	28.95 (22)	9.39 (29)	<.0001	11.00 (32)	25.86 (15)	.003

rate) answered questions about their abuse/adverse experiences status and sociodemographics. A fifth of the sample reported a history of neglect or abuse at some stage of their life. The association of each category of abuse in all life phases—childhood, adolescence, adulthood—and suicide ideation was statistically significant at P<.0001.

Childhood Abuse and Adult Obesity

Reported height and weight of participants were converted to BMI categories. Table 1 describes the obesity status of American Indian adults by reported abuse over their lifespan. Experiences of reported sexual abuse in childhood greatly outnumber abuse in adolescence and adulthood. Individuals reporting childhood physical abuse and sexual abuse had statistically significant differences in BMI categories (P=.02 and P=.02, respectively). Being physically abused or sexually abused in childhood is associated with higher concentrations of obese individuals (see Table 1). Abuse, as an adolescent or adult, was not statistically associated with BMI categories.

Cultural Connectivity

Cultural connectivity—the quality, state, or capability of being connective or connected[13]—was defined in this study as speaking a tribal language, participating in cultural practices, and feeling connected to your community. Experiencing abuse/neglect in several lifespan categories was found in this study to be associated with poor cultural connections to one's community (see Table 2). Particularly, having poor cultural connectivity was associated with (1) physical and sexual abuse in childhood (P=.02 and P=.0001, respectively); (2) physical and sexual abuse in adolescence (P=.03 and P=.004, respectively); (3) sexual abuse in adulthood (P=.008); (4) verbal abuse in adulthood (P=.02); and (5) feeling repeatedly neglected in adolescence (P=.01) and adulthood (P=.003). When examining participant responses to wellness status, low perceptions of wellness were associated with poor cultural connectivity (P=.02).

Perception of General Health Status and Perceived Wellness

Adult American Indians were asked 2 questions to assess their perception of general health and wellness status (see Table 3). To the first question they were asked, "In general, would you say your health is: excellent, very good, good, fair or poor?" Most respondents rated their health as good or excellent/very good. There was statistical significance (P=.008) between lifetime abuse and general health status.

For the second question, participants were asked: "Wellness includes feeling good and taking care of yourself physically, emotionally, mentally, and spiritually. How would you rate your own wellness: excellent, good, fair or poor?" Poor perception of wellness status was found to be correlated with suicide ideation (P=.007) and with poor cultural connectivity (P=.02). When analyzing gender responses, both male (n=138) and female (n=318) participants reported similar levels of suicide ideation (24.2% and 24.3%, respectively). Statistically significant gender/sex differences were found in all 3 types of reported abuses: sexual (12% females and 2% males, P<.01), physical (25% females and <1% males, P<.0001), and verbal (40% females and 17% males, P<.0001) abuse in adulthood. Significantly higher proportions of females reported childhood sexual abuse (18%) as opposed to only 3% of males (P<.0001). In contrast, no significant gender/sex differences could be found either in physical or sexual abuses in adolescence. In addition, feeling repeatedly neglected in adulthood (16% for females vs 5% for males,

Table 3. Perception of general health status and self-report of lifetime abuse

General health measure	N (426) % (n)	Reported abuse % (n)	Reported no abuse % (n)	P value
Fair/poor	20.42 (88)	22.79 (49)	18.06 (39)	.008[a]
Good	38.75 (167)	43.72 (94)	33.80 (73)	
Excellent/very good	40.84 (176)	33.49 (72)	48.15 (104)	

[a] Represents a statistical significance level of <.01

P<.01) and in adolescence (P=.01) was shown to be significant between gender/sex groups.

Discussion

Suicide ideation is a significant problem in American Indian populations.[14] One-fifth or 20% of study participants reported having desires or thoughts of suicide. Such adverse experiences as physical and sexual abuse, verbal abuse, and feelings of neglect were analyzed to explore their relationship to suicide ideation. This study found statistically significant associations between suicide ideation and physical and sexual abuse, primarily in childhood, reported by adult American Indians in California. In addition, our findings identified verbal abuse and feeling repeatedly neglected in adolescence and adulthood as associated with suicide ideation.

Perceptions of health status and wellness were also an important measure to consider in this study. Poor perception of health and poor perception of wellness status were found to be correlated with suicide ideation and with poor cultural connectivity. The impact of adverse experiences was also seen in chronic health conditions, as this study found a strong association between obesity and adverse events in childhood. American Indian adults are 50% more likely to be obese than non-Hispanic Whites,[15] and are 3 times more likely than non-Hispanic White adults to be diagnosed with diabetes,[15] thus the need for surveillance and prevention of obesity among youth is evident.

Physical, verbal, or sexual abuse can trigger many pathways of chronic or severe stress to increase the risk of childhood obesity.[16] The neuroendocrine and physiological consequences of these events include dysregulation of the hypothalamic-pituitary-adrenal axis, anomalies in the hormonal response to stress, and alterations in appetite characterized by a need for highly palatable "comfort foods."[17,18] These abuses are also associated with obesity-related behaviors, such as poor impulse control, lack of sleep, binge eating, and depression.[17,18]

The risk for suicide ideation and suicide completion may be attributed to many factors. For example, chronic health problems, such as obesity, can also be associated with suicide ideation. Also, individuals who experience various forms of trauma can have a higher risk of suicide.[7,8] There are several factors that are thought be protective and may help to mitigate suicide ideation. These include support from families and communities and having the ability to access needed health care services.[9] The relationship between thoughts of suicide and chronic disease is an important area of investigation, providing potential avenues for intervention and education.

Study Strengths and Limitations

There are several strengths in our study. The first is the ability to work with tribal communities and Indian clinics to collaborate on the design and implementation of the study to ensure cultural sensitivity via participatory research. Accessibility to the clinic patient roster was essential to collect randomized household sampling. Tribal research approval enhanced community and household agreement and trust for participation in the study.

There are some limitations of the study that must be acknowledged. The self-selection of the clinics that agreed to participate in the study and the limitations of the composition of the sample, such as the overrepresentation of female respondents in the study, are limitations. The small sample of male respondents may be due to increased single-family households headed by women or male participants that were not at home or chose not to self-identify as a household member when the study staff distributed the surveys. There is a possible bias in the interpretation of terms, such as *abuse* and *neglect*, as these are subjective measures. Additionally, there is potential for bias in population-based surveys, arising from possible absence of study subjects from the household when the surveys are being administered. Furthermore, the household may not adequately represent the high-risk nonhousehold population groups that may be mobile or transient. California has a very large population of American Indians and owing to time and financial constraints there was limited access to all residents. As a result, the researcher chose to randomly sample a small portion of households of adult clinic users residing at participating sites.

Conclusion

Identifying adverse experiences and the impact on adult suicide ideation among American Indians provides important information for education and intervention. More studies are needed to understand the role of chronic diseases, trauma and adverse experiences, and cultural bonding in suicide ideation situations to support culturally sensitive interventions for improving wellness status. These efforts should also include programs to address the problem of disparate chronic disease and suicide ideation among American Indians.

Conflict of Interest

No conflicts of interest reported by authors.

Author Contributions

Research concept and design: Hodge; Acquisition of data; Hodge; Data analysis and interpretation: Hodge, Roca III, Samuel-Nakamura, Robbins, Warda; Manuscript draft: Hodge, Roca III, Samuel-Nakamura, Robbins; Administrative of technical and material support: Roca III, Samuel-Nakamura, Robbins, Warda

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