



Sexual risk behaviors and the legacy of colonial violence among Northern plains American Indian youth: A mixed methods exploratory study



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ABSTRACT

Introduction: In this article, we honor the tribal remembering of two Northern Plains tribes to illustrate how the legacy of colonial violence frames the way in which substance use and mental health affect sexual risk behaviors among American Indian youth on the reservation today.

Methods: We used a multi-phase, mixed quantitative and qualitative methods design within a community based participatory research framework to illustrate how the legacy of colonial violence frames epidemiological links between substance use, mental health, and sexual risk behavior among American Indian youth. We conducted semistructured interviews with 29 individuals and administered questionnaires to 298 American Indian youth living in a reservation environment.

Results: Our findings explicate how a legacy of colonial violence underlies epidemiological links between mental health and substance use with sexual risk behavior among youth. Salient facets of colonial violence included systematically altered living arrangements, the boarding school era, eroded traditional practices, and the entry of extractive industries onto native lands.

Discussion: The colonial violence enacted against the ancestors of Northern Plains tribal peoples materializes in the health of those living on the reservation today. Community interventions, which seek to address the role of substance use and mental health in sexual risk behavior, could benefit from delineating tribal perceptions regarding the legacy of colonial violence on public health outcomes through the use of a CBPR framework.

1. Introduction

Integrating Indigenous ways of knowing with public health research and practice in American Indian (AI) communities demands a demeanor of epistemic practice where participants are presumed to be “knowers” as opposed to subjects under study (Verran, 2018; Hallett et al., 2017). While positivism plays a key role in elucidating health disparities, the everyday practices of positivism (including the development and testing of hypotheses) remain linked to the disavowal of Indigenous ways of knowing encountered not only during the conquest of the Americas, but over generations of Eurocentric knowledge building practices associated with modernity/coloniality (Mignolo and Walsh, 2018). Providing testimonies, remembering, and reframing are research activities that have been implemented by indigenous communities (Tuhiwai-Smith, 2012), and which may offer points of connectivity with settler epistemological practices in collaborative public health research projects focused on indigenous health. In this

manuscript, we use a pluralistic epistemological approach to elucidate the deleterious effects of select colonial processes on AI sexual and reproductive health (SRH).

1.1. Sexual and reproductive health among AI youth in Montana

AIs show appreciable health disparities in SRH outcomes. In comparison to Caucasians, AI youth have shown earlier onset of sexual intercourse (McMahon et al., 2015), elevated teen birth rates (Garwick et al., 2008; Hagen et al., 2012), elevated rates of pre-term birth and low birth weight (Hamilton et al., 2009, 2015; Martin et al., 2013), elevated infection with STIs (Centers for Disease Control and Prevention [CDC], 2015, 2017; Leston and Finkbonner, 2016), and elevated rates of miscarriages and ectopic pregnancies (CDC, 2014a,b).

In remote reservation communities where Northern Plains AI youth are located, these disparities are both local and national. For AI high school youth living on or near a reservation in Montana, AI youth show

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elevated rates of ever having sexual intercourse and number of sexual partners in comparison to Hispanic, white, and high school youth nationally (CDC, 2018a; Montana Office of Public Instruction, 2019). Sexually Transmitted Infections (STIs) among AI youth age 15–19 are the highest in the western state for chlamydia (4139 per 100,000) compared to white youth in the state (1333 per 100,000) and exceed national rates of chlamydia for youth age 15–19 (2072.4 per 100,000) (CDC, 2018b; Montana Department of Public Health and Human Services [MT DPHHS], 2016a). As of 2018, 6.6% of Montana's population identified as AI, yet comprise 40% of gonorrhea cases and 23% of chlamydia cases reported that year (MT DPHHS, 2019). For Montanan AI females ages 15–19, the birth rate is 74.2 per 1000 compared to the national average of 23.2 per 1000 (MT DPHHS, 2016a, b). Beyond documenting disparities in AI youths' SRH outcomes, understanding the factors contributing these outcomes at a national and local level remains challenging.

Contemporary public health research often focuses on proximal determinants of SRH risk behaviors, with alcohol use being an example of a “risk factor.” Indeed, AI youth report significantly higher alcohol and substance use and poor SRH outcomes when compared to non-Native youth (de Ravello et al., 2014). Previous research demonstrates that AI youth have perceived an inevitable link between getting drunk and having sex, and described experiencing acts of sexual coercion relative to drinking (Kaufman et al., 2007). Other research found that younger initiation of sex was associated with alcohol and drug use at first sex in AI males and females (Mitchell et al., 2007). Despite the identification of risk factors occurring within an individual's life cycle, ignoring the historical factors (both locally and nationally) that contribute to public health issues such as substance use in Indigenous communities perpetuates structural violence through analytic omission (Farmer et al., 2006). There are multidimensional relationships between alcohol and substance use, mental health, and sexual risk behavior in AI youth that extend beyond proximal or even lifetime predictors of risk. Relationships that are modeled in mainstream public health research sparingly consider the extent to which local memories of colonial processes in AI communities interact with contemporary public health issues.

Our study team has previously examined SRH in the context of intergenerational trauma that is “passed down” through generations, where collective traumatic recollections of the loss of land, language, traditional spiritual ways, and other culturally significant events are perceived by the individual who reports psychological symptoms in the present (Whitbeck et al., 2004). We have previously documented that Anxiety/Depression and Anger/Avoidance symptoms of Historical Loss were associated with an increased likelihood of multiple sexual partners in young AI men (Anastario et al., 2013). These findings have raised further questions about the structural foundations of sexual risk behaviors among AI youth, and how to address them.

This manuscript is concerned with Indigenous perspectives regarding measurable SRH outcomes in a tribal community in Montana. It is focused on a problem (SRH outcomes) and the way in which risk factors for sexual risk behaviors have been structured by processes of colonization. We examine results alongside quantitative outcomes data from a survey depicting the present-day relationships between alcohol and substance use, mental health, and sexual risk behaviors among their youth. This mixed methods research leverages an epistemologically pluralistic framework to illustrate the deleterious effects of colonial processes on SRH among Northern Plains American Indian youth.

2. Materials and methods

We used a temporally staged, multi-method approach that is conducive to tribal remembering (Tuhivai-Smith, 2012) and that created space for indigenous narratives of colonial contact and remembering in the context of alcohol and substance use, mental health, and sexual risk behavior among 15 to 18-year-old AI youth living in a reservation

setting in a western state. We used a sequential exploratory design to understand SRH issues among adolescents on the reservation in which we conducted semistructured interviews before conducting the youth survey (Creswell, 2003). First, we conducted a series of focus groups with tribal members (not reported) to inform the development of a semi-structured interview instrument. Then, we conducted semi-structured interviews. The semistructured interview findings highlighted areas of interest that were further explored with a quantitative survey in schools, which AI youth attend.

2.1. Study setting

Our study took place on a reservation in a western state in the Northern Plains region of the United States. There are approximately 8000 enrolled tribal members living on the reservation who are descendants of the Nakoda, Nakota, Nakona, Lakota, and Dakota Nations.

2.2. Community based participatory research framework

This study builds upon a 14-year partnership between tribal members and researchers affiliated with Montana State University (MSU), which utilizes a community based participatory research (CBPR) framework to combine Indigenous expertise in traditional knowledge, contemporary reservation culture, and local tribal resources with Westernized research skills in SRH research among tribal members. A community advisory board made up of five tribal members provided oversight and guidance on the study, including development of the study design, data collection instruments, and interpretation of the qualitative and quantitative data. The Institutional Review Board (IRB) in the tribal community where the study took place provided ethical approval for the study, reviewed and approved this manuscript for publication. The MSU IRB also provided ethics oversight and approval for the study. Youth were given \$10 iTunes gift cards and adults received \$25 visa cards for participation. Youth who reported abuse were identified and their situation was discussed with the appropriate school administrators to provide the necessary services and support available on the reservation for the youth.

Focus groups and interviews were conducted in 2015. The youth survey was administered in 2016. After data were analyzed and this manuscript was developed, the tribal IRB reviewed and approved the manuscript for submission to *Social Science and Medicine*. The lengthier timeline reflects our use of a CBPR approach.

2.3. Qualitative sampling

We generated our qualitative sample for the semistructured interviews using a purposive sampling strategy. The research team worked with the Community Advisory Board to identify the interviewees to ensure that they were representative of the different communities across the reservation, including cultural representation, gender (male/female), and age. Additionally, the research team and CAB ensured the interviewees were comfortable talking about sex. Twenty-nine individuals including 19 females and 10 males participated in semi-structured interviews.

2.4. Semi-structured interview instrument

The semi-structured interview was focused on six domains that emerged from the previous focus groups with community members regarding SRH among tribal youth. The domains included: parenting; traditional beliefs regarding STIs and pregnancy; relationships; trauma, grief, and loss; barriers to accessing SRH services; and ideas for a potential intervention. Semi-structured interview data were collected and analyzed prior to developing the content of the youth survey. However, the quantitative youth survey was focused on some of these domains (but not all).

2.5. Quantitative sampling

Following qualitative data collection, we developed a youth survey to administer to a population-based sample of youth attending one of five schools located on or near the reservation. Within each school, the administration and research team reviewed the school roster and identified all students between the ages of 15–18 years old to determine when and where (relative to the school day) the apparent population of students would be available for sampling. The youth survey was administered over a three-month period in five schools. At the time of the survey administration, there were 424 students in the final sampling frame. One female tribal member from the research team and one male tribal member from the study's community advisory board administered surveys. Informed consent was obtained through an "opt out" letter that was sent home to the parents. Eighteen-year-olds were allowed to consent for themselves. Prior to survey administration, all students were given an informed consent form to read and sign; and the informed consent was read out loud by one of the survey administrators. Surveys were administered to students on laptop computers in groups of 10 using Computer Assisted Self Interview (CASI) with survey administrators providing guidance. Surveys took approximately 45–60 min to complete. No parents opted out and all students who were approached to take part in the survey participated. The discrepancy between the final sample size ($n = 298$) and the population in the sampling frame ($N = 424$) is a result of absenteeism across the five schools, which occurred during data collection.

The CASI included a broad range of domains, but for the purpose of the current investigation we focused items related to demographics, connection to traditional culture, sexual risk behaviors, adverse childhood experiences, substance and alcohol use and depression.

2.6. Sexual risk behaviors

We measured sexual risk behaviors using items derived from the "Pathways of Choice" survey that addressed engagement in sex and condom use (Mitchell and Kaufman, 2002; Manson et al., 2005; National Center for American Indian and Alaska Native Mental Health Research, 2020; Whitesell et al., 2012; Whitesell et al., 2014). Youth were asked whether they had ever engaged in sex (no, yes). Sex was defined as "vaginal sexual intercourse and anal or oral sex." Youth were also asked whether they used a condom the last time they had sex (no, yes). Engagement in sex was coded dichotomously (0 = no, 1 = yes), and within the subset of individuals reporting that they had engaged in sex, inconsistent condom use was treated as a separate dichotomous variable (0 = did not use condom during last sexual contact, 1 = used condom during last sexual contact). Models for condom use excluded all youth who did not report ever having sex.

2.7. Adverse childhood experiences

Adverse childhood experiences (ACE) were measured using a 10-item construct derived from the ACE questionnaire (Felitti et al., 1998), which assesses various types of childhood adversities (Bruskas and Tessin, 2013). We scored each of the items dichotomously (0 = unexposed, 1 = exposed), and we also calculated one overall summary score representing the total number of adverse childhood experiences. Individual adverse childhood experiences showed high internal consistency reliability in this sample of youth (KR20 = 0.75).

2.8. Depression

We used a 7-item version of the Center for Epidemiologic Studies-Depression (CES-D) Scale for assessing depressive symptoms, which has been shown to correlate with negative life events and discrimination (Thrane et al., 2004). Youth were asked whether they had experienced a given symptom during the past week using a 4-point frequency-based

scale ranging from 0 = none of the time (0 days) to 4 = most or all of the time (5–7 days). In the present study, the 7-item instrument showed excellent internal consistency reliability (Cronbach's alpha = 0.93). We developed one overall sum of symptoms score (ranging 0–21), and we evaluated a depression threshold (using a cutoff value of ≥ 9), which has previously been associated with the detection of clinically significant symptoms of depression (Salinas-Rodríguez et al., 2013).

2.9. Alcohol and substance use

Alcohol and substance use measures were drawn from the Youth Risk Behavior Survey (CDC, 2014b). Respondents were asked how frequently they used various substances (alcohol, marijuana, methamphetamines, cocaine, ecstasy, heroin, steroids, and/or inhalants) over the 30-day period preceding the survey. We dichotomized each of the substances to represent whether a survey respondent had used a given substance in the 30 days preceding the interview (0 = used the substance 0 times, 1 = used the substance ≥ 1 time(s)). We also calculated the total number of substances used in the 30 days preceding the survey, which had a potential range of 0–8.

2.10. Perceptions of connectivity to traditional culture

We used five questions with Likert scaled response sets to measure perceptions of connectivity to traditional culture that focused on perceived way of life connections, importance of spiritual beliefs, and AI pride (Moran and Bussey, 2007; Phinney, 1992). Items regarding AI and White/Anglo perceived way of life connections had a 4-point frequency-based Likert scaled response set ranging from 1 = not at all to 4 = a lot. The two items regarding level of importance assigned to Indian and Christian spiritual beliefs had 4-point Likert scaled response set ranging from 1 = not at all important to 4 = very important. One question regarding AI pride was also administered.

2.11. Data analysis

2.11.1. Qualitative data analysis

For the qualitative research, we used an inductive analytic approach in which we systematically coded and analyzed data for emergent themes that drove the presentation of results (Charmaz, 2006; Corbin and Strauss, 2008). The inductive coding approach is amenable to a CBPR framework where new themes may emerge from data that is being collected and reported back to a tribal community on an iterative basis. Semi-structured interview transcripts were coded in Atlas.ti (Atlas.ti). Open codes were used to produce a set of axial codes that were then used to develop tertiary codes to structure the results and discussion sections of this manuscript.

2.11.2. Quantitative data analysis

Quantitative data were analyzed using STATA 14 statistical software (StataCorp, 2015). Univariate means and frequencies were examined relative to sexual risk outcomes. Internal consistency reliability for ACE and depression measures was calculated using the KR20 and Cronbach's alpha statistics, respectively. Two-tailed T tests and Pearson Chi-Square tests were conducted to examine bivariate relationships between the dependent variables and continuous and categorical independent variables, respectively. We examined the Variance Inflation Factor (VIF) to test for multicollinearity, and the Box-Tidwell test of nonlinearity to test for nonlinear relationships between the dependent variables and continuous independent variables. Logistic regression was used to calculate odds ratios for sexual risk outcomes, and was also used to adjust for the potentially confounding effects of age and gender. Standard errors of the logits were adjusted for clustering by study site. To test for relationships between child sexual abuse and the number of substances used, we used the general linear model. Statistical significance was established at $p < 0.05$.

Table 1
Characteristics of a sample of AI youth living on reservation, n = 296.

Characteristics	Total	Male	Female
Gender, N (%)			
Male	141 (47.8%)	154 (100%)	–
Female	154 (52.2%)	–	141 (100%)
Federal tribe recognition status, N (%)			
Member	244 (82.4%)	117 (87.3%)	126 (84.0%)
Associate member ^a	33 (11.2%)	14 (10.5%)	19 (12.7%)
Neither/missing	19 (6.4%)	3 (2.2%)	5 (3.3%)
Study site, N (%)			
Brockton	31 (10.5%)	12 (8.5%)	19 (12.3%)
Culbertsons	11 (3.7%)	8 (5.7%)	3 (2.0%)
Frazer	36 (12.2%)	14 (9.9%)	22 (14.3%)
Juvenile Detention Center	4 (1.4%)	0 (0.0%)	4 (2.6%)
Poplar	153 (51.7%)	82 (58.2%)	70 (45.5%)
Wolf Point	61 (20.6%)	25 (17.7%)	36 (23.4%)
Current level of school/education, N (%)			
9th	94 (31.8%)	46 (32.6%)	47 (30.5%)
10th	83 (28.0%)	38 (27.0%)	45 (29.2%)
11th	60 (20.3%)	26 (18.4%)	34 (22.1%)
12th	59 (19.9%)	31 (22.0%)	28 (18.2%)
Age of student, mean (SD)	15.7 (1.2)	15.6 (1.2)	15.9 (1.2)
Has engaged in sex, N (%)	149 (50.3%)	71 (50.4%)	78 (50.7%)
Did not use condom at last sexual encounter if engaged in sex, N (%)	66 (45.5%)	33 (48.5%)	33 (42.9%)

^a Refers to an individual who does not meet the federally designated blood quantum to be an official member of a federally recognized tribe in the United States.

3. Results

We surveyed 298 youth, 296 of whom answered questions regarding sexual activity and to whom we limited quantitative analyses. One-hundred forty-nine students (50.3%) reported ever having engaged in sex. Among youth who reported engaging in sex, 145 answered questions regarding condom use during last sex, with 66 (45.5%) of those who reported having sex not using a condom during last sexual contact, and 4 not responding. Among youth surveyed, 82.4% reported being a member of a tribal affiliation and 11.2% reported being an associate member. The average age of students was 15.7 years (see Table 1). Youth did not vary appreciably by gender, federal tribe recognition status, or study site on engagement in sexual behavior nor for condom use during last sexual contact. Age and education level were associated with engagement in sex, with older/higher educated students being more likely to engage in sex. There was evidence of multicollinearity between age and education level (VIF = 4.01), and we thus chose to control for age instead of education in the adjusted models, which did not show evidence of nonlinearity with either of the dependent variables. We also adjusted multivariable models for gender and clustering by study site.

In the semistructured interviews, adult and elder tribal members made reference to the relationships between alcohol and substance use, mental health, and poor SRH outcomes in what we refer to from here onward as the *legacy of colonial violence*. This legacy included temporally disparate actions or events that were conceptualized as underlying current SRH outcomes among youth. This conceptualization was comprised of emergent findings from the semistructured interviews including: eroded spiritual practices; child sexual abuse after forced removal of children from indigenous home environments; the introduction of alcohol; and depression, spatial disruption, and the loss of intimate connections. Below we explicate each of these themes and present corresponding patterns derived from the quantitative youth survey.

3.1. Eroded spiritual practices

Discontinuations in traditional spiritual practices governing how individuals conceptualize and act in relation to local environments were used to explain sexual risk behaviors among tribal youth on the reservation. Some participants described how Christian evangelization introduced the concept of sex as a taboo, undermining Indigenous conceptualizations of puberty, sexual initiation, reproduction, menstruation, and alternative expressions of gender and sexuality. Prior to talking about menstruation, one Dakota (Sioux) woman narrated a cosmological framework for understanding female reproductive potential:

Wenahi Takango is a spiritual path. So, when somebody passes away here, they say that their spirit goes through that doorway, those four stars on the big dipper, where Tolwhea sits - your spirit will go through that door. And then she'll walk with you off ... until you get to Wahkantanka. When you get to him they say that he'll review everything that you've done in your life ... if you don't have the blue mark, he'll push you off of the path and you'll have to be reborn into this world again until you get it right. And generally, we say that you go through this life 7 times before you get it right.

This process of spiritual reproduction and marking cannot be separated from the sacred power exhibited by a woman during menstruation. In this context, a woman menstruating on a monthly basis manifests her power to call lives into the world:

Tolwhea takes care of that spirit at that doorway until the mother is ready to bring that life into this world to give birth to it. So spiritually, Tolwhea keeps that baby there ... All while those 9 months that girl was on Earth and she's preparing to have that baby and it's growing inside of her at that time, Tolwhea is holding that child at that doorway waiting for her to be ready. And once she's ready they say that's their first ceremony, your very first ceremony is coming into this world, being born into this world.

Furthermore, within the four stages of life conceptualized by the Dakota, the second stage (age 12 to 21) was described as when young people begin to learn self-respect. Women have coming of age ceremonies, and kinship networks share a base spiritual acknowledgement and respect for everyday tasks (such as food preparation). Under the Dakota way, a mother may teach her children about reproductive functioning by relating family members' experiences of menstruation to their spirituality. Mothers may encourage young women in the family to engage in plant cultivation or husbandry practices that denote menstruation and reproduction as sacred. For example, one Dakota woman describes how sage cultivation is implicated in female reproductive health:

... that's why we keep our sage, that's why we as women go and we harvest our sage because at that time even through the winter months we need it. So that's one of the things I believe that should be taught to these young girls is that they need to know how to respect themselves again. They need to come back into the circle to realize that they are important. That people should have respect for you as a young woman because you're powerful. Even at that time.

In contrast, Christian evangelization was described as disintegrating the pre-colonial link between spirituality and reproductive health and changing the perception of SRH to something that is taboo, immoral, shrouded in silenced, and governed by non-local and foreign practices. Degrading traditional cultural practices that integrated basic human reproductive functions was one of the ways in which the legacy of colonial violence was narrated as structuring the present sexual risk behavior among youth on the reservation.

There were limited quantitative data regarding spiritual practices that could point directly to these beliefs, but there were relatively high levels of perceived connectivity to White/Anglo ways of life and

Table 2
Perceptions of connectivity to traditional culture and sexual behavior in a sample of AI youth living on the reservation, n = 296.

Perceptions of connectivity	Has engaged in sex		Condom use during last sexual encounter						
	Mean (SD)	No	Yes	aOR ^d	95% CI	Did not use condom	Used condom	aOR ^d	95% CI
		(n = 147)	(n = 149)			(n = 79)	(n = 66)		
How much do you now live by or follow an American Indian way of life? ^a	2.5 (.8)	2.5 (0.8)	2.5 (0.8)	1.0	(0.9–1.2)	2.5 (.9)	2.5 (.8)	1.0	(0.5–2.0)
How much do you now live by or follow a White or Anglo way of life? ^a	2.3 (.9)	2.3 (1.0)	2.3 (0.9)	0.9	(0.7–1.1)	2.3 (.9)	2.3 (1.0)	1.0	(0.8–1.2)
How important is it to you to follow religious or spiritual beliefs which are based on traditional Indian beliefs? ^b	3.0 (.8)	3.0 (0.8)	3.1 (0.8)	1.3	(0.9–1.7)	3.0 (.8)	3.2 (.8)	1.5	(0.9–2.3)
How important is it to you to follow religious or spiritual beliefs which are based on Christian beliefs such as Catholic, Baptist, Mormon, etc. ^b	2.7 (1.0)	2.8 (1.0)	2.6 (1.0)	0.8	(0.7–1.0)*	2.6 (1.0)	2.7 (1.0)	1.0	(0.8–1.3)
How proud are you to be an American Indian? ^c	3.9 (0.4)	3.8 (0.4)	3.9 (0.3)	1.9	(1.5–2.5)***	3.9 (0.2)	3.8 (0.4)	0.4	(0.2–0.8)**

Abbreviations: aOR Adjusted Odds Ratio; CI Confidence Interval; SD Standard Deviation.

*p < 0.05, **p < 0.01, ***p < 0.001.

^a Response set: 1 = not at all, 2 = a little, 3 = some, 4 = a lot.

^b Response set: 1 = not at all important, 2 = not very important, 3 = somewhat important, 4 = very important.

^c Response set: 1 = not at all proud, 2 = not very proud, 3 = somewhat proud, 4 = very proud.

^d Results are derived from a logistic regression controlling for the effects of age and gender, with standard errors adjusted for study site.

Christian beliefs. All perceived connectivity measures tended toward the upward ranges of the distribution (Table 2). While perceptions of connectivity across way of life connection scores showed a negative correlation for AI vs. White/Anglo items (rho = -0.15, p = 0.012), importance of spiritual belief questions showed a positive correlation for traditional Indian beliefs vs. Christian belief questions (rho = 0.24, p < 0.001). That both of the spiritual belief items exceeded the middle range and were positively correlated illustrates the commonality of Christian beliefs, perhaps syncretic with indigenous beliefs but nonetheless prevalent, among youth on the reservation today (Table 2). Those who attributed more importance to following religious or spiritual beliefs based on Christianity were 0.8 times less likely to report engaging in sex (aOR = 0.8, 95% CI 0.7–1.0, p < 0.05).

3.2. Child sexual abuse through the boarding schools

The legacy of colonial violence also produced consequences that mirrored the original colonial violence itself. The forced removal of AI children from their homes and the systematized sexual assault of AI children in federally sanctioned boarding schools (from 1869 through the 1960s) (National Native American Boarding School Healing Coalition) was another example of the legacy of colonial violence that was narrated. One young man poignantly explained how:

child molestation is a huge thing around here, man, it's a major problem ... I remember someone, I think it was my grandpa ... who told me that that started with the boarding schools. They'd steal all these kids and half of them would be raped while they were in them boarding schools, they'd come back and they'd be all messed up and they'd rape their kids because they were messed up ... it just kept going and going and going and it's still going on today.

Here, the young man is retelling a transmitted memory of the “boarding school era,” where Indigenous children were forcibly removed from their home environments and immersed in federally funded, Christian, English speaking school environments in order to assimilate them into Euro-American culture (Hoerig, 2002). Older generations transmit a living memory of this violence, which is still referenced on the reservation today:

... see my dad went to boarding school, as you guys probably know that whole movement ... the ways were beaten out of them. Don't speak your tongue, cut your hair, kill the Indian to save the man.

In the 21st century, a young man repeats a line he heard his father say, which reflects an 1892 writing by Captain Richard H. Pratt, the founder of the Carlisle Indian School who wrote: “all the Indian there is in the race should be dead ... Kill the Indian in him and save the man.” (Hoerig, 2002).

Our quantitative findings validate observations from the semi-structured interviews that child sexual abuse is related to sexual risk behaviors among youth. Fourteen percent of youth reported the childhood experience of having an adult or person > 5 of age touch or fondle them in a sexual way or attempt oral, anal, or vaginal intercourse. Youth who reported experiencing childhood sexual abuse were 2.7 times more likely to have already engaged in sex (aOR = 2.7, 95% CI 1.8–4.2, p < 0.001) (Table 3). Among sexually active youth, the individual experiences of reporting unstable material conditions/poverty, verbally abusive parents, not feeling loved/supported, a biological parent ever having been lost, a mother who experienced physical violence, or a household member who was depressed were each associated with a significantly increased likelihood of not using condoms in comparison to those who did not have these particular experiences (Table 3). Among sexually active youth, each additional experience of childhood adversity reported was associated with a 1.3 increase in the odds of not using a condom at last sexual encounter (aOR = 1.3, 95% CI 1.1–1.6, p < 0.01) (Table 3).

Table 3
Adverse childhood experiences and sexual behavior in a sample of AI youth living on the reservation, n = 296.

	Has engaged in sex		Condom use during last sexual encounter			
	No	Yes	Used condom	Did not use condom	aOR ^a	95% CI
	(n = 147)	(n = 149)	(n = 79)	(n = 66)		
Adverse childhood experience						
Parent/adult swore, insulted, put down, humiliated, made to feel might be physically hurt, %	30.8%	45.6%	34.6%	60.6%	2.8	(2.2-3.6)**
Parent/adult pushed, grabbed, slapped, or hit so hard to leave marks/injury, %	21.9%	34.2%	29.5%	41.5%	1.7	(1.0-2.9)
Adult or person > 5 years older touch or fondle in a sexual way or attempt oral, anal, or vaginal intercourse, %	8.9%	18.5%	10.4%	28.8%	3.4	(1.0-11.7)
Didn't feel loved by family, didn't feel important or special, or family didn't look out for each other, didn't feel close or supportive, %	25.2%	37.7%	28.2%	49.2%	2.4	(1.4-4.2)**
Didn't have enough to eat, wore dirty clothes, nobody to protect, or parents too drunk or high to engage in caretaking/take to the doctor, %	10.2%	13.0%	9.1%	18.2%	2.1	(1.5-3.1)**
Biological parent ever lost through divorce, abandonment, death, or other reason, %	38.4%	44.2%	32.1%	57.6%	3.0	(2.1-4.2)**
Mother was pushed, grabbed, slapped, had something thrown at her or kicked, bitten, hit or threatened with a weapon, %	16.6%	22.1%	16.9%	29.2%	2.0	(1.3-3.2)**
Lived with anyone who was a problem drinker or alcoholic, or who used street drugs, %	41.5%	53.7%	50.0%	60.6%	1.6	(0.7-3.4)
Household member depressed or mentally ill, or attempted suicide, %	21.2%	27.0%	20.3%	34.8%	2.0	(1.2-3.4)**
Household member went to prison, %	24.0%	36.5%	34.2%	39.4%	1.2	(0.5-3.3)
Total Adverse Childhood Experiences Score, mean (SD)	2.4 (2.3)	3.3 (2.5)	2.6 (2.3)	4.2 (2.4)	1.3	(1.1-1.6)**

Abbreviations: aOR Adjusted Odds Ratio; CI Confidence Interval; SD Standard Deviation.

*p < 0.05, **p < 0.01, ***p < 0.001.

^a Results are derived from a logistic regression controlling for the effects of age and gender, with standard errors adjusted for study site.

3.3. The introduction of alcohol

One often repeated theme was that alcohol and substance use are factors that drive high rates of STIs and unplanned pregnancies on the reservation. Alcohol was narrated as being introduced by Europeans/White Americans, then prohibited in the early 20th century, and then legalized again: “our ancestors never drank it and they’ve lived for thousands of years. We never started having problems and a breakdown in our society until that way came over and with them ... it’s not only alcohol, but with them came that.” Alcohol use was perceived to become more prevalent as oil extractive industries entered the reservation space, where outsiders looking for work on the reservation would bring with them the demand for alcohol, which was perceived as driving supply and a culture of drinking on the reservation.

In the semistructured interviews, some children on the reservation were described as being exposed to alcohol and substances in utero, while others were described as growing up in family environments where alcohol and substances are regularly used. Children were described as growing up in environments where they may observe parents engaging in disordered alcohol and/or substance use and subsequently engaging in sex with casual sex partners. There were other descriptions of children being directly taught by their parents how to consume particular substances and/or abusing the same substances with their parents.

Some interviewees described how even though people on the reservation might know how STI transmission occurs, that knowledge will be ignored while intoxicated and people will engage in unprotected sex. In other cases, interviewees described situations in which young people on the reservation traded sex for alcohol and/or substances due to a lack of financial resources. For individuals living with substance use dependency, local rehabilitation services were described as being inadequate, bureaucratic, and difficult to navigate for individuals in need. In some cases, there was a direct link between trauma and alcohol and/or substance use, where alcohol and/or substance use was employed as a coping mechanism to deal with uncomfortable symptoms of earlier trauma. One woman who became infected with gonorrhea describes her use of alcohol:

... I used alcohol at a young age and found that to be a pain killer, so being under the influence, literally looking for someone to love you leads to poor choices, promiscuity and you're very vulnerable to contracting a disease if you're not consciously making a decision to use protection ...

In our youth sample, 61% had ever consumed alcohol and 27% had consumed alcohol in the 30 days preceding the interview. Youth reported using alcohol, marijuana, methamphetamines, ecstasy, and inhalants in the thirty days preceding the survey, and nobody reported using cocaine, heroin, nor steroids. The overall number of substances used (mean 0.68 substances with a range of 0–4) was associated with ever having sex, with the odds of having sex increasing by 2.4 for every additional substance used (aOR = 2.4, 95% CI 2.1–2.8, p < 0.001) (Table 4). Youth who reported using alcohol were 1.8 times more likely to report engaging in sex in comparison to youth who did not report using alcohol (aOR = 1.8, 95% CI 1.4–2.2, p < 0.001). In comparison to youth who did not use marijuana, youth who reported using marijuana were 1.4 times more likely to engage in sex (aOR = 1.4, 95% CI 1.3–1.5, p < 0.001) and 1.1 times more likely to not use a condom during their last sexual encounter (aOR = 1.1, 95% CI 1.0–1.2, p < 0.05). Youth who reported using methamphetamines were 2.5 times more likely to report engaging in sex (aOR = 2.5, 95% CI 1.3–5.0, p < 0.05) and youth who reported using inhalants were more likely to report not using a condom during their last sexual encounter (aOR = 1.4, 95% CI 1.3–1.6, p < 0.001). For each additional substance used, there was a 2.4 increase in the likelihood of having ever engaged in sex (aOR = 2.4, 95% CI 2.1–2.8, p < 0.001) (Table 4).

Table 4
Recent substance use and sexual behavior in a sample of AI youth living on the reservation, n = 296.

Substance used in the past 30 days	Has engaged in sex				Condom use during last sexual encounter			
	No	Yes	aOR ^a	95% CI	Used condom	Did not use condom	aOR ^a	95% CI
	(n = 147)	(n = 149)			(n = 79)	(n = 66)		
Alcohol, %	12.9%	40.9%	1.8	(1.4–2.2)***	39.2%	43.9%	1.0	(0.8–1.3)
Marijuana (grass, pot, weed, or reefer), %	18.4%	47.0%	1.4	(1.3–1.5)***	38.0%	57.6%	1.1	(1.0–1.2)*
Meth (speed, crystal, crank, or ice), %	0.7%	4.7%	2.5	(1.3–5.0)*	3.8%	6.1%	1.4	(0.8–2.6)
Inhalants, %	3.4%	9.4%	1.6	(0.9–2.8)	6.3%	13.6%	1.4	(1.3–1.6)***
Overall number of substances used, mean (SD)	0.4 (0.7)	1.0 (1.1)	2.4	(2.1–2.8)***	0.9 (1.0)	1.2 (1.1)	1.3	(0.8–2.0)

Abbreviations: aOR Adjusted Odds Ratio; CI Confidence Interval; SD Standard Deviation.

*p < 0.05, **p < 0.01, ***p < 0.001.

^a Results are derived from a logistic regression controlling for the effects of age and gender, with standard errors adjusted for study site.

3.4. Depression, spatial disruption, and the loss of intimate connections

Over the course of colonization, the US government confined AI communities to reservation spaces that included new modes of housing that were described as disrupting everyday life. These living arrangements varied markedly from earlier traditional housing arrangements and living styles. One woman described how

Generational trauma that happened during the reservation days ... locating Indians on reservations and breaking up the original family structure of AI people into independent households, single man, single wife ... it's just not the same type of family structure that Indians had pre-reservation days ... The reservation was created in 1888, so it's been a really short time that AI people have been living, or trying to live this type of family structure. So, trauma has carried over, it hasn't been that long, 100 some years, 150 years.

Early descriptions of Northern Plains tribes by colonists described communities of tipis where eight individuals slept in a tipi within encampments of 200–800 persons, and where everyday life was focused on hunting and ceremonial engagement (Rodnick, 1937). In contrast, colonization structured reservations and an assumption of isolated nuclear family units within residential structures that produced a reduction in opportunities for everyday contacts with community members and kin. These changes altered cultural dynamics relevant to SRH outcomes.

For example, prior to colonization, it was described that if a woman experienced intimate partner violence (IPV), she could place her spouse's belongings outside the tipi, which was an immediate signal for community intervention, and where the union would be subsequently dissolved. That is, a simple gesture implicating one's housing structure could signal distress to the community, and cause an IPV intervention. Now living in contemporary housing units that are physically distant but also subject to overcrowding within the home, community contact in neighborhoods is less interactive between households. These housing dynamics exist in a relatively remote section of Montana.

The relative isolation of contemporary reservation spatial dynamics was perceived as underlying not only poor family outcomes, but also depression. Suicides were perceived to be a problematic trend among young people on the reservation. Participants described a perceived lack of intimate and close connections among young people, and an inability to even know whether a young person was feeling distressed or lonely. In such instances, a yearning for meaningful bonds while experiencing distress, hopelessness, and depression were described as leading youth to seek meaningful connections through sex. One participant described her fear for youth who perceived the lack of connections on the reservation:

They're the ones who scare me because they know there's something different. They know that they should be able to have somebody that's got their back. And if you don't have that and you don't think

you can get it, you get really discouraged, what are you going to do?

Our quantitative findings regarding symptoms of depression and sexual health outcomes reinforce the perception that youth experiencing distress experience a greater likelihood to engage in sex and sexual risk behaviors. The average CESD-7 score among youth in the sample was 5.6 (SD = 6.1), and 27.9% scored ≥ 9 , the threshold indicating probable depression. While select symptoms of depression were positively associated with ever engaging in sex, including thinking that life had been a failure, feeling lonely, having crying spells, or feeling sad, all of the symptoms of depression were individually and positively associated with not using a condom during last sexual contact (Table 5). In addition, youth with probable depression were 4.5 times more likely to not use a condom at last sexual contact in comparison to those youth without probable depression (aOR = 4.5, 95% CI 3.1–6.6, p < 0.001).

4. Discussion

We used quantitative and qualitative methods to describe and explicate how the legacy of colonial violence materialized in sexual risk behaviors through Indigenous narratives of alcohol/substance use and mental health relative to AI youth living on a reservation in the US today. Our findings have implications for understanding SRH risks associated with alcohol/substance use and mental health within the larger context of colonial violence affecting AIs and the generation of youth who are currently exhibiting SRH disparities. Our study illustrates how particular facets of colonial violence, including eroded spiritual practices, abuses experienced during the boarding school era, the introduction of alcohol, and changes in living environments have structured present day AI youths' sexual risks. These select themes underscore an everyday understanding of the way in which the violence of settler colonialism is implicated in SRH issues among reservation youth. The particular facets of colonial violence described here were those that were salient for tribal members and should not be considered exhaustive. The intergenerational effects of this colonial violence are partially constitutive of structural violence, which refers to the long-standing economic and political organization of society that imposes emotional and physical distress on the individual (Galtung, 1969; Farmer et al., 2006; Bourgois, 2001). Research in Canada has shown how settler colonialism has played out in laws and policing practices that result in increased danger and sexual violence to indigenous women's bodies, including (but not limited to) allegations of rape and sexual assault by police officers (Dhillon, 2015). These issues are historically rooted in events such as the 1876 passage of the *Indian Act* in Canada, which has been described as both Euro-Centric and sexist in the way in which it undermined indigenous women and their children (Bourassa et al., 2004). In the US, paternal and individual boarding school attendance have been associated with chronic health problems among AIs (Running Bear et al., 2019), and participants in our sample perceived that boarding schools played an intergenerational role in SRH

Table 5
Symptoms of depression and sexual behavior in a sample of AI youth living on the reservation, n = 296.

Symptoms of depression ^a	Has engaged in sex				Condom use during last sexual encounter			
	No	Yes	aOR ^b	95% CI	Used condom	Did not use condom	aOR ^b	95% CI
	(n = 147)	(n = 149)			(n = 79)	(n = 66)		
I felt depressed	0.8 (1.0)	1.0 (1.1)	1.3	(0.9–1.9)	0.8 (1.0)	1.4 (1.2)	1.6	(1.3–1.9)***
I felt that I could not shake off the blues even with help from my family or friends.	0.7 (1.0)	0.8 (1.0)	1.1	(0.8–1.4)	0.5 (0.9)	1.1 (1.1)	1.7	(1.3–2.1)***
I thought my life had been a failure	0.6 (1.0)	0.9 (1.1)	1.4	(1.1–1.8)*	0.7 (1.0)	1.2 (1.2)	1.5	(1.2–1.9)***
I felt fearful	0.5 (0.9)	0.7 (1.0)	1.3	(0.9–1.8)	0.4 (0.8)	1.0 (1.2)	1.7	(1.3–2.3)***
I felt lonely	0.9 (1.1)	1.1 (1.2)	1.2	(1.0–1.4)*	0.8 (1.1)	1.6 (1.3)	1.7	(1.3–2.3)***
I had crying spells	0.6 (0.9)	0.7 (1.0)	1.2	(1.0–1.5)*	0.4 (0.7)	1.0 (1.2)	1.9	(1.7–2.1)***
I felt sad	0.8 (1.0)	1.2 (1.0)	1.5	(1.1–2.0)**	0.9 (0.9)	1.5 (1.1)	1.7	(1.1–2.6)**
CESD-7 score ≥ 9	23.3%	32.6%	1.7	(0.8–3.7)	17.6%	50.0%	4.5	(3.1–6.6)***
Total CESD-7 score	4.9 (5.8)	6.4 (6.4)	1.0	(1.0–1.1)*	4.4 (5.1)	8.7 (7.0)	1.1	(1.1–1.2)***

Abbreviations: aOR Adjusted Odds Ratio; CI Confidence Interval; SD Standard Deviation.

*p < 0.05, **p < 0.01, ***p < 0.001.

^a Symptoms were measured with the following response set: 0 = None of the time (0 Days), 1 = Rarely or A little of the time (1–2 days), 2 = Some of the time (3–4 days), 3 = Most or all of the time (5–7 days).

^b Results are derived from a logistic regression controlling for the effects of age and gender, with standard errors adjusted for study site.

outcomes for local AI youth. Placing AI youth SRH outcomes in the context of local narratives of laws and policies that have denigrated Indigenous health is one way to document and acknowledge the deleterious effects of colonial violence that have structured SRH outcomes over time.

Known risk factors for poor health outcomes that reflect patterns of structural violence against indigenous people, such as poverty, unemployment, exposure to violence, trauma, and early childhood adversity (Brookie et al., 2015; Sarche and Spicer, 2008; Manson et al., 2005; Anastario et al., 2013; Hillis et al., 2000) were some of the same factors that arose during interviews and were evident in the quantitative data. In particular, the prevalence of childhood adversities among youth in our sample point to the way in which youths' SRH prospects are structurally compromised within their current life cycles. Many of the ACEs examined in our study reflect the social circumstances of parents or caregivers who may have had similar experiences during their own childhoods, and it is probable that the risk factors structured for AI youth are intergenerational. A graded relationship has previously been reported between ACEs and a self-reported history of sexually transmitted infections among adults (Hillis et al., 2000). Further, in a separate study of youth from a different Northern Plains tribe, assault by a family member was positively associated with number of sexual partners for women, and witnessing a trauma was positively associated with number of sexual partners for men (Kaufman et al., 2004). In our sample, we detected an average of > 3 adverse childhood experiences among youth engaging in sex and > 4 experiences among those engaging in sex who did not use a condom at last sexual contact. As we have shown in our study, experiences of childhood adversity among AI youth have been in part structured by the state with serious consequences playing out over generations.

Remembering colonial violence in the context of a study about SRH among AI youth is one way that we attempt to honor the perspectives of tribal members who depict "a reality that is temporally much richer and more multilayered than can be known by the forgetter ..." (Gross, 2011). Because of these historical events and the ways that they are recollected and narrated among indigenous communities, there are methodological dilemmas related to engaging tribal communities in research (Cochran et al., 2008; Wilson, 2008). One such dilemma includes our partial reliance upon settler epistemological assumptions to document and exhibit quantitative SRH outcomes of an intergenerational process of colonial violence, which was explicated using both constructivist and Indigenous epistemological practices.

Epistemological pluralism is a strategy we attempted to employ in this manuscript and that we recommend for future SRH research with AIs. However, we caution that local legacies of settler colonialism are pervasive in mainstream research practices, and require ongoing attention in collaborative projects that aim to decolonize public health knowledge production. In the 1970s, the anthropologist Luis Kemnitzer wrote that the first response of the Lakota to questions about White men involves *fears about the outcome of the encounters*, where a sense of lack of control is reinforced by "the seemingly whimsical appearance and disappearance of government programs, vetoes of tribal council actions, experiences with White owners and clerks in trading posts, and experiences of children and parents with White teachers." Kemnitzer's assertion that the underlying Lakota view of illness is that "disease is a result of conquest by Whites" (Kemnitzer, 1976) bears similarity to our rendering of SRH in the context of colonial violence, approximately four decades later. *Re-socializing* SRH outcomes among AIs means that ongoing narratives of SRH issues in AI communities are not waiting "to be discovered," but rather serve as guiding frames to conceptualize quantitatively documented SRH outcomes and associations in the present lifespan.

The adult and elder tribal members who participated in the semi-structured interviews identified crucial strategies for healing and transforming the SRH disparities among the current generation of tribal youth. Interviewees described desires for reimplementing traditional spiritual practices and coming of age ceremonies with youth, improving family cohesion and parent-child communication about topics related to SRH, and orienting agencies on the reservation to better serve the SRH needs of youth. These topics are far more than cultural considerations that would inform an externally conceptualized intervention – these are guiding principles for Indigenous interventions. Interviewees discussed the need for long-term SRH interventions that acknowledge the inevitability of colonial impact and simultaneously cultivate intra-reservation capacity to develop sexually responsible youth. Strategies such as these may reduce SRH disparities among AI youth as they concurrently experience structural-historical forces that impact their SRH in the present time, as illustrated by our current study.

Finally, this study was conducted on the behest of the Tribal Executive Board to university researchers to address tribal leadership concerns about SRH disparities among youth on the reservation. While CBPR has become an established methodological framework for partnering with AI communities to conduct research, research regarding the effects of colonial violence on SRH is sparse. CBPR has the potential to

facilitate thoughtful SRH intervention development and implementation in AI communities, given its amenability to honoring the voices of tribal members in the research process (Israel et al., 2008; Wallerstein and Duran, 2003, 2006).

4.1. Limitations

Our results regarding colonial violence cannot be generalized to other reservations or tribes, and our quantitative findings can only be generalized to the population of youth surveyed on the reservation. Absenteeism affected the response rate (nearly 30% absent), and it is possible that absent students could perhaps present more risk behaviors than those present. Furthermore, high absenteeism rates on the reservation are common and dependent on the time of year. Nevertheless, surveying in schools was our best and most efficient method for contacting youth. Social desirability may also have impacted the implementation and results of our study as the interviewers were known to participants, and survey administrators were known to the youth survey respondents. However, in keeping with our study's CBPR framework, it was the members of the study's community advisory board that made the decisions regarding the data collection procedures for the semistructured interviews. The use of known tribal members was felt to increase the interviewees depth of responses on such a culturally sensitive topic in AI communities as those related to SRH. Similarly, the community advisory board and school administrators felt that youth would be more comfortable with known survey administrators. Nonetheless, we did use CASI to administer the youth survey, which has the potential to mitigate social desirability bias in surveys regarding sensitive health risk behaviors (Ghanem et al., 2005; Macalino et al., 2002; Newman et al., 2002). Further, due to space considerations, we did not include measures of historical trauma in the youth survey, which may have provided further quantitative information to support the arguments made in this manuscript. Finally, even though this study was carefully designed in partnership with tribal community members, it was focused on problematic aspects of SRH (as opposed to behavioral strengths or resiliency) and only focused on perceivably salient and retrievable memories regarding facets of colonial violence that could be narrated as having a direct impact on sexual risk behaviors. There are indeed other narratives, events, and aspects of colonial violence that could vary by health outcome and/or resilience to the violence itself, and the local AI community in which it materializes.

5. Conclusion

Understanding the extent to which the legacy of colonial violence impacts SRH among AI youth is necessary for the biological longevity and cultural rejuvenation of future generations of AIs. In this multi-phase, mixed methods study, we presented tribal narratives from adults and elders regarding how the legacy of colonial violence was conceptualized as affecting alcohol and substance use, mental health, and sexual risk behaviors among youth. Further, we integrated results from a survey of tribal youth to delineate how alcohol and substance use, and mental health related to sexual risk behaviors among contemporary AI youth. In particular, we described how eroded traditional cultural practices, the boarding school era, the introduction of alcohol, and altered living arrangements results in SRH consequences for AI youth in the present. Future SRH intervention research is warranted that honors and re-socializes public health issues with Indigenous conceptualizations of health. Present day, tribally-driven desires to reestablish traditional coming of age practices, increase familial responsibilities in the education of their children about SRH, and build the capacity within their communities to meet the SRH needs of youth demand that alternative paradigms be employed to understand and intervene.

Credit author statement

Elizabeth Rink was the Principal Investigator for this research study and provided the overall conceptual development, analysis, writing and preparation of the manuscript. Mike Anastario conducted the analysis as well as the conceptual development and writing of the manuscript. Paula FireMoon also provided conceptual development, analysis and writing of the manuscript. In addition, Paula FireMoon and Elizabeth Rink were responsible for the study's implementation. All authors have reviewed the submitted manuscript and approve the manuscript for submission.

Declaration of competing interest

None.

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