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The development and testing of a multi-level, multi-component pilot intervention to reduce sexual and reproductive health disparities in a tribal community

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ABSTRACT

This manuscript presents the results from a multi-level, multi-component pilot intervention designed to reduce sexual and reproductive health (SRH) among American Indian (AI) youth living on a reservation in the Northwestern United States. Our theoretical framework included community based participatory research (CBPR) and Ecological Systems Theory (EST). The pilot intervention was a school-based curriculum for youth and parents and a cultural mentoring program. Mixed methods were used including a pre/post test design and focus groups. Quantitative data was analyzed using McNemar's chi-square and a random effects model. Qualitative data was analyzed with grounded theory and content analysis. Parents reported increased communication about SRH topics with their children. Youth reported increased condom use self-efficacy, increased condom use, and positive agreement with attitudes toward pregnancy. Our results also suggest increased communication about SRH topics in parent dyads and the need for increased communication with elders. Future research is needed to test the efficacy of multi-level, multi-component tribally driven SRH interventions for AI youth and their families that integrate contemporary SRH issues with traditional values and beliefs.

KEYWORDS

Community based participatory research; pilot intervention; sexual and reproductive health; tribal communities

Introduction

American Indian (AI) populations have disproportionately high sexual and reproductive health (SRH) disparities (Centers for Disease Control and Prevention [CDC], 2014). Teen births, pre-term birth, low birth weight, miscarriages and ectopic pregnancies, and sexually transmitted infections (STIs) are much higher in AIs compared to other racial and ethnic populations (CDC, 2013, 2014). Also, the incidence of HIV and HCV in AI populations in the United States continues to rise (CDC, 2017a).

Current literature suggests that the experiences of Colonialization that AI populations have endured in the United States, such as sexual violence and rape, theft of land use and water rights, family denigration through boarding schools, the criminalization of cultural practices and forced sterilization of AI women, inform their SRH disparities (Arnold, 2014; Gurr, 2012). In addition, poverty, isolation, alcohol and other drug use, physical and sexual victimization, and lack of comprehensive and coordinated SRH education and clinical services influence unintended pregnancies and STIs in AI communities (De Ravello et al., 2014; Whitesell et al., 2014). Evidence also suggests that

ambivalence toward sex, social pressures, depression, and anxiety among AIs contribute to their poor SRH outcomes (Hanson et al., 2014).

This collective body of knowledge highlights that SRH among AI population is influenced by the combination of individual, historical, structural, and community dynamics. Thus, to improve SRH outcomes in AI populations, novel multi-level interventions are needed (Tingey et al., 2017). This manuscript presents the results from a multi-level, multi-component pilot intervention designed to reduce SRH among AI youth ages 15 to 18 years old. The purpose of this study was to refine and tailor a pilot intervention for a larger clinical trial with AI youth and their families on a reservation.

Pilot intervention model

Community based participatory research

Our pilot intervention was built on a 14-year partnership using community based participatory research (CBPR) between a tribal community in the Northern Plains and outside non-Indigenous researchers from a land grant research institution (Rink et al., 2016). Central to our use of CBPR was a community advisory board (CAB) and a tribal and outside non-Indigenous research team that worked collaboratively to design and implement the pilot intervention. The CAB provided oversight and guidance for the pilot intervention and included five tribal members representing an equitable distribution of gender, age and tribal affiliation reflective of the community in which the pilot intervention was conducted. The tribal research team consisted of three full to part time paid staff. There were two outside non-Indigenous researchers.

Pilot intervention design

Our pilot intervention was developed in collaboration with the CAB and the tribal and outside non-Indigenous research team. Over 12 months meetings were held to review and discuss our current data on the tribal youth that was gathered during an exploratory study that took place to identify community needs. Existing literature on SRH interventions was also reviewed and discussed by the CAB and research team. Based on this iterative, collaborative process the three levels of the pilot intervention were designed using Ecological Systems Theory (Table 1) (Bronfenbrenner, 1999).

The individual level component included the implementation of the school based SRH curriculum for AI youth called *Native Stand*. For the purpose of our pilot intervention, *Native Stand* was adapted from a 28-module SRH curriculum to 18-module. Content focused on SRH topics that were relevant to a tribal and culturally context in addition to general SRH education. Examples of topics addressed in *Native Stand* were culture and tradition, healthy relationships, and pregnancy and parenting within a tribal context, negotiation and refusal skills and effective communication. The family level component was based on an adaptation of *Native Voices* that was originally designed for AI youth. For the purposes of our pilot intervention we adapted 5 modules from *Native Voices* into 3 modules. The 3 *Native Voices* modules provided education to parents regarding how to communicate with their children about sensitive topics such as sex, condom and birth control use, and STIs. The community level component involved a cultural mentoring program that was designed by the tribal language and culture program. The cultural mentoring program provided male and female elders to mentor youth participating in the pilot intervention in traditional values, beliefs and practices related to kinship networks and concepts of family and genealogy, male/female roles and beliefs about healthy relationships, and cultural beliefs about sex and how to make decisions about sex that integrate traditional values.

The pilot intervention took place over 9 weeks. During the 9-week period *Native Stand* was implemented twice a week. *Native Voices* was implemented three times at the tribal community school in the early evening. The cultural mentoring program was implemented in small groups during the class periods that *Native Stand* was taught. As incentives, the youth received 10.00 USD Google Play or I-Tunes cards and the parents received 20.00 USD gift cards to a local convenience store.

Table 1. Pilot intervention conceptual model.

Community Based Participatory Research Process								
Community Identifies Needs *10 focus groups * 29 key informants * Discussions with tribal leadership	➔	Develop Ecological Systems Theory Framework * A holistic approach to SRH: individual, family, community	➔	Design and Implement Pilot Intervention * Pre/post test with youth and parents	➔	Evaluate Pilot Intervention * 2 focus groups with youth and parents * Analysis of pilot data	➔	Determine Next Steps for Behavioral Health Intervention
Ecological Systems Theory Framework of Intervention								
Individual Level Native Stand <i>18 session school based curriculum twice a week (NS)</i> NS 1: Introduction NS 2: Culture & Tradition – Part 1 NS 3: Culture & Tradition – Part 2 NS 4: Healthy Relationships – Part 1 NS 5: Healthy Relationships – Part 2 NS 6: Reproductive Health – Part 1 NS 7: Reproductive Health – Part 2 NS 8: Pregnancy & Parenting NS 9: Preventing Pregnancy NS 10: Condoms and Birth Control NS 11: Sexually Transmitted Diseases NS 12: HIV/AIDS & HCV NS 13: Drugs & Alcohol & Sex NS 14: Mental Health & Sex NS 15: Negotiation & Refusal Skills NS 16: Decision Making NS 17: Effective Communication NS 18: Putting It All Together			Family Level Native Voices <i>3 sessions delivered to parents in the early evening (NV)</i> NV 1: Introduction and talking with youth about topics related to sexual and reproductive health NV 2: Strategies for fostering healthy relationships in your child’s intimate relationships NV 3: Prevention of STIs, HIV/AIDS and HCV			Community Level Cultural Mentoring Program <i>3 cultural mentoring sessions delivered in small groups during class periods (CM)</i> CMP 1: Kinship networks and concepts of family and genealogy CMP 2: Traditional male/female roles and Cultural beliefs about healthy relationships CMP 3: Cultural beliefs about sex and how to make decisions about sex that integrate cultural values		

Materials and methods

Data collection

The pilot intervention took place on a reservation in the north western United States in one of the reservation’s smaller communities (population 225). The CAB suggested this particular setting because they believed the community’s small size would be instrumental in assisting with understanding the processes necessary to take when implementing a complex intervention. Youth and parents participating in the pilot intervention completed pre- and posttest surveys. Feedback on the pilot intervention was provided in two separate focus groups.

Sample and recruitment

In total, 17 youth participated in *Native Stand* and 12 parents participated in *Native Voices*. The youth and parents all completed pre-and post-intervention surveys. Two homogenously composed focus groups were conducted at the end of intervention’s implementation to get feedback on the strengths and weaknesses of the intervention content. One focus group included 6 youth who participated in the intervention and completed the student pre-post intervention survey. The other focus group included 4 parents who participated in the intervention and completed the parent pre-post intervention survey. The youth and parent participants all identified as AI. This sample size represented half of the total population of youth and their parents between the ages of 15 – 18 attending school in this community.

The youth and parents were drawn from the high school located in the community where the intervention was taking place using purposive selection. The members of the tribal research team worked closely with school administration and teachers to present and discuss the study and identify the most appropriate ways to approach youth and their parents to participate in the pilot intervention. The members of the tribal research team approached the youth in the 10th, 11th, and 12th grades during their health class

to talk about the pilot intervention and answer questions. Parents were mailed letters to their homes with information about the pilot intervention. In addition a parent meeting during after school hours was held to inform parents about the pilot intervention and to provide the parents an opportunity to ask questions to the tribal research team. Written consent was received from both the youth and their parent for youth participation in the study. Parents gave written consent for their participation. Youth and their parents were told they could withdraw from the study at any time. Institutional Review Board (IRB) approval for the study obtained from outside-non-Indigenous researchers home institution and the tribal IRB. The tribal IRB also reviewed and approved this manuscript for publication.

Questionnaires

The parent and youth questionnaires were administered prior to and immediately following the completion of the pilot intervention. Parent questionnaires included items on SRH topics they communicated about with their child/children. Youth questionnaire included items measuring sexual risk behaviors, parent/legal guardian communication, cultural identity, self-efficacy regarding condom use and birth control, knowledge and attitudes regarding pregnancy, healthcare accessibility, mental health and substance use. Our primary outcome measure was the ratio of condom use frequency relative to sexual intercourse frequency in the 30 days preceding questionnaire administration (Tingey et al., 2017). Questionnaires were administered using Computer Assisted Self Interview (CASI) (Ghanem et al., 2005).

Measures

The measures used in this study are presented in Table 2. Due to the limited sample size, individual items are reported for each measurement domain instead of reducing the number of items using factor analysis or other item-reduction techniques.

Focus groups

Following the completion of the pilot intervention, two focus groups were conducted by a member of the CAB. Open-ended questions were asked about the strengths and the challenges of the pilot

Table 2. Summary of data collection measures for student and parent survey.

Measure	Reference	Number of Items	Description
<i>Youth Survey</i>			
Attitudes regarding hypothetical pregnancy	(Mitchell et al., 2000)	13 items	Three-point Likert Scale 1 = <i>Disagree</i> , 3 = <i>Agree</i>
Self-efficacy regarding condom use	(Beckman et al., 1992)	12 items	Five-point Likert Scale 1 = <i>Not at all confident</i> , 5 = <i>Extremely confident</i>
Sexual risk behavior: Ratio of condom use to sexual engagement	(Bernstein et al., 2012)	2 items	Number of times of sex in past month Number of times condom was used in past month
Depression symptoms over past week	(Haroz et al., 2014)	10 items	0 = 0 days, 1 = 1–2 days 2 = 3–4 days 3 = 5–7 days
Substance use	(CDC, 2017b)	8 items	Sum of one-month history using alcohol, marijuana, meth, cocaine, ecstasy, heroin, steroids, and inhalants
Demographic information		4 items	Gender, age, town, sexuality
<i>Parent Survey</i>			
Parent/legal guardian-child SRH communication	(Beckett et al., 2010)	25 items	1 = <i>Yes</i> , 0 = <i>No</i>
Global ability to communicate with child and ability to communicate about sex	(Jerman & Constantine, 2010)	3 items	Five-point Likert Scale 1 = <i>Difficult</i> , 5 = <i>Easy</i>
Demographic information		4 items	Gender, age, highest education completed, marital status

intervention, perceived changes in youth behavior, the cultural mentoring component of the intervention, and experiences completing the pre- and posttest questionnaires. All focus group participants consented to participation. The focus groups were recorded and transcribed.

Data analysis

Quantitative and qualitative data were used in our pilot intervention. Quantitative data were analyzed using STATA 14 statistical software (StataCorp, 2015). Parent and youth datasets were separately examined to determine scores on key domains prior to (pre) and following (post) implementation of the intervention. McNemar's chi-square test was used to evaluate relationships between dichotomous communication measures pre- and post-intervention. Each variable with a Likert scale response set was evaluated using a random effects model, where random effects were specified for the constant (individual youth or parents). Due to the small sample size and the pilot nature of this project, we examined the relative direction of beta values and standard errors of the estimates and focused less on a statistical significance criterion.

For the qualitative research, we used grounded theory to systematically code and analyze data for emergent themes (Corbin & Strauss, 2008). The focus group transcripts were coded in Atlas.ti (ATLAS.ti). One coder used open codes to develop a set of axial codes. These axial codes were shared and discussed between the CAB, the tribal and the non-Indigenous research team. Changes in the axial codes based on this discussion were given back to the coder to develop new axial codes. Themes were then developed that were again discussed with the CAB, the tribal and the non-Indigenous research team. Based on this discussion, the coder finalized the themes that were then used to write the qualitative results section of the manuscript. This iterative, inclusive process ensured that themes in the qualitative data were relevant to the tribal community.

Results

Quantitative findings

Of the 12 parents participating in the baseline and follow-up surveys, 33% were male, 92% completed a high school education, 50% were married, and the majority (>50%) were older than 40 years of age. Two of the parents had multiple children who participated in the intervention. Among the 17 youth participating in both surveys, 52.9% were female, the majority were ≥ 16 years of age, 76.5% were from the community in which the pilot intervention took place, and 82.4% identified as heterosexual (Table 3).

Among the parents, there was an overall increase from 3.3 at baseline in self-evaluated ease in communicating with child about sex ($\beta = 0.75$, $SE = 0.27$, $p = .005$). Notable increases in communicating with children about condom use were observed following the pilot intervention. Increases were observed in communicating with children about what to do if a partner doesn't want to use a condom (from 41.7% at baseline to 75% at follow-up, McNemar's chi-square = 4.0, $p = .046$), how to use a condom (from 8.3% at baseline to 36.4% at follow-up, McNemar's chi-square = 3.0, $p = .083$), and how well condoms can prevent sexually transmitted infections (from 75% at baseline to 100% at follow-up, McNemar's chi-square = 3.0, $p = .083$) (Contact corresponding author for detailed results).

Youth attitudes regarding a prospective pregnancy moved in various directions relative to the intervention. There was less agreement with the statements: "it would take away my freedom" ($\beta = -0.47$, $SE = 0.2$, $p = .047$) and "my family would be upset or disappointed" ($\beta = -0.35$, $SE = 0.2$, $p = .107$). There were larger increases in agreement with the statements "it would encourage me to keep my job or look for a better job," ($\beta = 0.47$, $SE = 0.2$, $p = .005$) "it would fit in with my plans" ($\beta = 0.29$, $SE = 0.1$, $p = .033$), and "I would consider it a great gift" ($\beta = 0.29$, $SE = 0.2$, $p = .068$) (Contact corresponding author for detailed results).

Table 3. Characteristics of parents and youth participating in the pilot intervention.

Characteristics	N	%
<i>Parents</i>	12	
Gender		
Male	4	33.3%
Female	8	66.7%
Town ^a		
Community #1	2	16.7%
Community #2	10	83.3%
Education		
Did not complete high school	1	8.3%
Completed high school	11	91.7%
Marital status		
Married	6	50.0%
Single	3	25.0%
Living with a partner/boyfriend/girlfriend	3	25.0%
Age		
20–30	1	8.3%
31–40	2	16.7%
41–50	6	50.0%
51–60	2	16.7%
61+	1	8.3%
<i>Youth</i>	17	
Gender		
Male	8	47.1%
Female	9	52.9%
Age		
14	1	5.9%
15	1	5.9%
16	7	41.2%
17	3	17.7%
18	4	23.5%
19+	1	5.9%
Town ^a		
Community #1	3	17.7%
Community #2	13	76.5%
Community #3	1	5.9%
Grade level		
9th	3	17.7%
10th	7	41.2%
11th	2	11.8%
12th	5	29.4%
Sexual identification		
Straight/heterosexual	14	82.4%
Bisexual	3	17.7%

^aThe pilot intervention took place in one town on the reservation (Community 2). The majority of the participants came from that town (Community 2) with the remaining participants coming from outside the town (Community 1 and Community 3).

Increases in condom-use self-efficacy were observed across all items (Table 4). Items with larger effect sizes included confidence in one's ability to discuss using condoms with a partner (beta = 0.76, SE = 0.32, $p = .016$), using a condom with a partner after drinking (beta = 0.54, SE = 0.28, $p = .053$), and suggesting to use a condom even if there was fear that the partner would think you have an STD (beta = 0.68, SE = 0.36, $p = .061$).

There was an increase in the ratio of condom use to sexual engagement following the intervention (beta = 0.40, SE = 0.20, $p = .05$) after controlling for the potentially confounding effects of gender and grade level (see Table 5, Model 1). The direction of the effect remained after controlling for depression and substance use measures, despite a modest reduction in the effect size (beta = 0.31, SE = 0.19, $p = .106$) (Table 5).

Table 4. Self-efficacy outcomes among youth participating in the pilot intervention, n = 17.

	Unadjusted values							
	Pre-intervention		Post-intervention		Random intercepts model ^a			
	Mean	SD	Mean	SD	Constant (pre)	SD youth	Beta (post)	(SE)
<i>How confident ...</i> ^b								
are you that you could suggest using a condom even if you were afraid that your partner would reject you	3.4	(1.4)	3.3	(1.3)	3.4	0.33	-0.07	0.41
are you that you could suggest using a condom even if you were unsure of how your partner felt about condoms	3.2	(1.3)	3.5	(1.2)	3.2	0.60	0.23	0.32
are you that you could suggest using a condom even if you were afraid that your partner would think that you have had sex with another person before	2.8	(1.2)	3.3	(1.1)	2.8	0.18	0.50	0.37
are you that you could suggest using a condom even if you were afraid that your partner would think you have an STD	2.9	(1.4)	3.6	(1.)	3.0	0.35	0.68	0.36
do you feel in your ability to discuss using condoms with your partner	2.6	(1.4)	3.4	(1.2)	2.6	0.73	0.76	0.32
do you feel in your ability to use a condom correctly	3.1	(1.5)	3.5	(1.1)	3.1	0.91	0.41	0.28
do you feel in your ability to put a condom on without breaking the sexual mood with your partner	2.5	(1.5)	3.2	(1.4)	2.5	0.37	0.66	0.44
do you feel in your ability to buy condoms without feeling embarrassed	2.3	(1.3)	2.8	(1.4)	2.3	1.10	0.47	0.28
are you that you could remember to carry a condom with you in case you need one	2.4	(1.4)	2.9	(1.1)	2.4	0.67	0.56	0.32
do you feel in your ability to use a condom with your partner even after drinking	2.6	(1.5)	3.2	(1.2)	2.6	1.03	0.54	0.28
do you feel in your ability to use a condom with your partner even if you are high	2.6	(1.5)	2.9	(1.2)	2.7	0.54	0.28	0.39
do you feel in your ability to use a condom with your partner even if you are sexually excited	2.9	(1.6)	3.4	(1.3)	3.0	0.79	0.37	0.38

Abbreviations: SE Standard error

^aScores have been adjusted for clustering by youth (random intercepts model).

^bIndividual item response sets were 1 = Not at all confident, 2 = Slightly confident, 3 = Moderately confident, 4 = Very confident, 5 = Extremely confident

Table 5. Condom use ratio (# times condom used/# times had sex) relative to depression and substance use in random intercepts models^a among youth participating in the intervention, n = 17.

Covariates	Model 1		Model 2		Model 3		Model 4	
	Beta	SE	Beta	SE	Beta	SE	Beta	SE
Constant	-0.10	0.62	0.11	0.56	0.08	0.68	0.20	0.57
Gender (male is comparison)	0.17	0.26	0.27	0.24	0.15	0.28	-0.03	0.25
Grade level	0.03	0.12	-0.03	0.11	0.00	0.13	-0.02	0.11
Depression Score	-	-	-	-	0.00	0.02	-0.02	0.02
Number of substances used in the past 30 days			0.18	0.09	-	-	0.24	0.11
Intervention effect	0.40	0.20	0.31	0.18	0.31	0.21	0.31	0.19
SD (youth)	0.08	0.08	0.06	0.05	0.10	0.09	0.06	0.05

Abbreviations: SE Standard error

^aScores have been adjusted for clustering by youth (random intercepts model).

Qualitative findings

The primary theme that emerged from the focus groups addressed improved communication. Parents reported improved communication in the following areas: 1) feeling more comfortable talking with their child about SRH because they had talking strategies and techniques after participating in the pilot intervention; 2) more communication within the parent dyad about SRH topics and how as parents they could speak with their child about SRH; 3) awareness of how their own upbringing impacted how they communicate with their child about SRH; and 4) being more comfortable to take their child to Indian Health Services or another clinic for STI testing or birth control.

For youth, improved communication was reported as: 1) feeling less awkward to talk to their parents about SRH; 2) increased understanding of the importance of knowing your family's kinship network and genealogy in order to avoid having an intimate relationship with "a cousin"; 3) feeling more comfortable talking to elders about cultural topics related to SRH; and 4) understanding different ways to communicate with a sex partner other than having sex.

Also addressed in the focus groups were design comments related to the strengths of the pilot intervention as well as possible improvements. Youth identified several benefits to *Native Stand*, including, the inclusivity of LGBTQ issues, a helpful glossary of SRH terms, trustworthy facilitators, and useful SRH lessons. Youth suggested that the pilot intervention be accessible throughout the reservation for course credit. Areas for improvement included: 1) organizing the *Native Stand* booklet better to reduce redundancies in the information; and 2) increasing the number of learning activities and games that could reinforce key lessons learned during each module.

Parents commented that some of the cultural components presented in *Native Voices* were not relevant to all the tribal members on the reservation because although there are two main tribes living on the reservation, each family may choose to teach their children different cultural ways. Also parents commented that not all families on the reservation practice traditional culture so it would be important in future implementations of the intervention to address contemporary reservation culture in addition to traditional cultural practices related to SRH. Parents reiterated that the parental component of the pilot intervention (*Native Voices*) was beneficial if parents invest time into it. There were suggestions that perhaps an aunt or uncle may be a better guardian/role if the primary parent is unable to attend the *Native Voices* lessons. Parents described wanting more activities that could be used to initiate or maintain conversations with youth. Parents also described wanting more exposure to the materials that youth were receiving during *Native Stand* and the Cultural Mentoring Program.

Discussion and conclusion

The preliminary results from our pilot intervention demonstrate improved SRH outcomes in tribal communities when intervention elements focus on individual, familial, and community level factors. The outcome that appeared to have the greatest impact on sex was increasing parent-child communication. Parents and youth reported more comfort talking about sensitive topics related to sex post participation in our pilot intervention. Specifically parents reported increase in SRH knowledge, in particular knowledge about STIs, birth control, how to use a condom, increased strategies for speaking with youth about sex, and increased communication within their parent dyad relationship.

There are several implications to these findings. Simply because one is a parent does not mean that they know about different SRH topics or that they are comfortable talking with their children about sex. Our pilot intervention suggests the importance of providing parents with similar education as their children. The need to provide parents with SRH education may be particularly important within AI families because of cultural norms regarding who can speak with whom within a family about SRH as well as the legacy of sexual violence and trauma within AI families, which may make it awkward and difficult to talk about SRH. Reported increased engagement in intrafamilial communication between parent dyads in our pilot intervention is also promising.

These findings highlight the need to rebuild traditional pathways of communication about SRH within AI families. Traditionally topics related to SRH were passed down in families and kinship networks through grandparents, aunts and uncles either in private conversations or through ceremonies. This communication pathway and teaching mechanism were disrupted through children being forced to leave home to be raised in boarding schools, forbidden to practice their traditional ceremonies or speak their Native language (Bigfoot & Funderburk, 2011). Parent education programs that provide knowledge to parents about SRH topics and how to communicate about SRH can have a positive impact on strengthening and healing AI families from the SRH injustices that created the context for the SRH disparities in today's AI communities (White et al., 2006).

Youths' attitudes toward pregnancy demonstrated that pregnancy would not take away their freedom or create discord within their family. Youth also reported that pregnancy: 1) had a positive influence on their motivations to get a good job; 2) fit into their life plans; and 3) was a gift. Previous research on attitudes toward pregnancy and pregnancy dynamics in AI communities demonstrate that pregnancy is central to traditional and cultural beliefs about the sacredness of life, the continuation of family and sacred knowledge, and essential to the continuation of a tribe, clan or band of people. Historically, pregnancy prevention interventions with AI populations have promoted colonial, predominately Christian beliefs about pregnancy such as waiting to have children until marriage, completion of post-secondary education and job/financial security (Hagen et al., 2012; McMahon et al., 2015). These colonial Christian based values do not always resonate with AI communities and do not adequately take into account the history of cultural and structural violence perpetrated on AI communities, which have contributed to poor SRH outcomes among AIs. From a Christian based pregnancy prevention paradigm, the attitudes toward pregnancy expressed by the youth in our pilot intervention could be viewed as troublesome because the results indicate that pregnancy is a positive part of a youth's life and is not viewed as a barrier to achieving life goals. From an AI viewpoint our pilot intervention results resonate with cultural beliefs and values regarding pregnancy and suggest the need to decolonize attitudes toward pregnancy that are based on colonial, Christian ideals (Gurr, 2012).

Youth self-reported increases in condom use self-efficacy, condom negotiation skills with a partner while drinking, and understanding STI risks. These findings reinforce the importance of integrating SRH education into educational systems as a standard of practice. Youth demonstrated an increase in condom use during sex after participating in the pilot intervention, regardless of gender or age. Increased condom use during sex also held true after considering depression and substance use. These findings hold promise despite the small effect size and lack of statistical significance. Empowering youth to take responsibility for their choices can begin to reconstruct AI youth's concepts of bodily determination that were eroded during Colonialization as a result of policies aimed at undermining AI peoples' decisions about their reproduction (Lumsden, 2016).

The feedback from the parents and youth in our focus groups suggested positive impacts of the pilot intervention and constructive suggestions for improvements. For example, SRH educational support for parents while their children are in high school may be helpful. Parents also suggested that including extended family such as aunts or uncles in the parent component of our intervention would be useful if parents are not able to attend. Youth feedback demonstrated the importance of strengthening intergenerational communication about cultural beliefs and practices related to SRH. This suggestion demonstrates the importance of extended family involvement in AI communities in which kinship relationships beyond the nuclear family are integral to family functioning. The integration of extended family members in interventions for AI communities supports traditional practices within families in which aunts, uncles and grandparents participated in the raising of children (Hossain et al., 2011; Hungry Wolf, 1982).

Our study had limitations. We used validated measures in our study. We also used CASI to increase perceived privacy and mitigate social desirability bias (Ghanem et al., 2005). However, because of our limited sample size for youth and parents our effect sizes were small and warrant cautious interpretation despite the reliability of the measures we used and our computerized data collection method. We conducted two focus groups which may not have gleaned feedback that was reflective of all youth and parents that participated in our pilot intervention. Although cultural adaptations were made to the *Native Stand* and *Native Voices* curricula, cultural specificity may hinder applicability to other tribes in different cultural contexts. Our pilot intervention did not include a system's level that addressed the coordination and access of SRH services for youth on the reservation. Previous research has documented the challenges of SRH services for AIs, such as accessibility, cultural appropriateness, and mistrust of health care providers (De Ravello et al., 2012). A system's level component may have strengthened our pilot intervention.

In summary, the purpose of this manuscript was to present the findings from a pilot intervention for AI youth and their parents aimed at reducing SRH disparities. Our results provide evidence for the positive impact a multi-level, multi-component intervention has for: 1) increasing knowledge and skills necessary to reduce high risk sexual behavior which can lead to poor SRH outcomes in tribal communities; and 2) increasing intrafamilial and intergenerational communication about SRH topics. Our pilot intervention supports the need for tribally tailored SRH interventions for youth and families. In order to improve SRH outcomes that have plagued AI communities since the onset of Colonialization innovative multi-level interventions must be developed, implemented and evaluated. Future research is needed to test the efficacy of multi-level, multi-component tribally driven SRH interventions for AI youth and their families that integrate contemporary realities of SRH issues with traditional values and beliefs.

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References

- Arnold, S. B. (2014). Reproductive rights denied: The Hyde Amendment and access to abortion for Native American women using Indian health service facilities. *American Journal of Public Health, 104*(10), 1892–1893. <https://doi.org/10.2105/AJPH.2014.302084>
- ATLAS.ti Scientific Software Development GmbH. Version 7.5.16.GmbH, Berlin. <http://atlasti.com>. 2020.
- Beckett, M. K., Elliott, M. N., Martino, S., Kanouse, D. E., Corona, R., Klein, D. J., & Schuster, M. A. (2010). Timing of parent and child communication about sexuality relative to children's sexual behaviors. *Pediatrics, 125*(1), 34–42. <https://doi.org/10.1542/peds.2009-0806>
- Beckman, L. J., Harvey, S. M., & Murray, J. (1992). Dimensions of the contraceptive attributes questionnaire. *Psychology of Women Quarterly, 16*(2), 243–259. <https://doi.org/10.1111/j.1471-6402.1992.tb00253.x>
- Bernstein, E., Ashong, D., Heeren, T., Winter, M., Bliss, C., Madico, G., & Bernstein, J. (2012). The impact of a brief motivational intervention on unprotected sex and sex while high among drug-positive emergency department patients who receive STI/HIV VC/T and drug treatment referral as standard of care. *AIDS and Behavior, 16*(5), 1203–1216. <https://doi.org/10.1007/s10461-012-0134-0>
- Bigfoot, D., & Funderburk, B. (2011). Honoring children, making relatives: The cultural translation of parent-child interaction therapy for American Indian and Alaska Native families. *Journal of Psychoactive Drugs, 43*(4), 309–318. <https://doi.org/10.1080/02791072.2011.628924>
- Bronfenbrenner, U. (1999). Environments in developmental perspective: Theoretical and operational models. In S. L. Friedman & T. D. Wachs (Eds.), *Measuring environment across the life span: Emerging methods and concepts* (pp. 3–28). American Psychological Association.
- Centers for Disease Control and Prevention. (2013). *U.S. Teen pregnancy outcomes by age, race and hispanic ethnicity*. <https://www.cdc.gov/teenpregnancy/pdf/teen-pregnancy-rates-2013.pdf>
- Centers for Disease Control and Prevention. (2014). *Health disparities in HIV/AIDS, Viral Hepatitis, STDs, and TB American Indians/Alaska Natives*. <https://www.cdc.gov/nchhstp/healthdisparities/americanindians.html>
- Centers for Disease Control and Prevention. (2017a). *HIV among American Indians and Alaska Natives in the United States*. <https://www.cdc.gov/hiv/group/raciaethnic/aian/index.html>
- Centers for Disease Control and Prevention. (2017b). *Youth risk behavior survey*. <https://www.cdc.gov/healthyouth/data/yrbbs/questionnaires.htm>

- Corbin, J., & Strauss, A. (2008). *Basics of qualitative research: Techniques and procedures for developing grounded theory*. SAGE Publications.
- De Ravello, L., Everett Jones, S., Tulloch, S., Taylor, M., & Doshi, S. (2014). Substance use and sexual risk behaviors among American Indian and Alaska Native high school students. *Journal of School Health, 84*(1), 25–32. <https://doi.org/10.1111/josh.12114>
- De Ravello, L., Tulloch, S., & Taylor, M. (2012). We will be known forever by the tracks we leave: Rising up to meet the reproductive health needs of American Indian and Alaska Native youth. *American Indian and Alaska Native Mental Health Research, (Online), 19*(1), i. <https://doi.org/10.5820/aian.1901.2012.i>
- Ghanem, K. G., Hutton, H. E., Zenilman, J. M., Zimba, R., & Erbeling, E. J. (2005). Audio computer assisted self interview and face to face interview modes in assessing response bias among STD clinic patients. *Sexually Transmitted Infections, 81*(5), 421. <https://doi.org/10.1136/sti.2004.013193>
- Gurr, B. (2012). The failures and possibilities of a human rights approach to secure Native American women's reproductive justice. *Societies Without Borders, 7*(1), 1–28.
- Hagen, J. W., Skenandore, A. H., Scow, B. M., Schanen, J. G., & Clary, F. H. (2012). Adolescent pregnancy prevention in a rural Native American community. *Journal of Family Social Work, 15*(1), 19–33. <https://doi.org/10.1080/10522158.2012.640926>
- Hanson, J. D., McMahon, T. R., Griese, E. R., & Kenyon, D. B. (2014). Understanding gender roles in teen pregnancy prevention among American Indian youth. *American Journal of Health Behavior, 38*(6), 807–815. <https://doi.org/10.5993/AJHB.38.6.2>
- Haroz, E. E., Ybarra, M. L., & Eaton, W. W. (2014). Psychometric evaluation of a self-report scale to measure adolescent depression: The CESDR-10 in two national adolescent samples in the United States. *Journal of Affective Disorders, 158*, 154–160. <https://doi.org/10.1016/j.jad.2014.02.009>
- Hossain, Z., Skurky, T., Joe, J., & Hunt, T. (2011). The sense of collectivism and individualism among husbands and wives in traditional and bi-cultural Navajo Indian families on the Navajo reservation. *Journal of Comparative Family Studies, 42*(4), 543–562. <https://doi.org/10.3138/jcfs.42.4.543>
- Hungry Wolf, B. (1982). *The ways of my grandmothers* (1st Quill ed.). Quill.
- Jerman, P., & Constantine, N. A. (2010). Demographic and psychological predictors of parent–adolescent communication about sex: A representative statewide analysis. *Journal of Youth and Adolescence, 39*(10), 1164–1174. <https://doi.org/10.1007/s10964-010-9546-1>
- Lumsden, S. (2016). Reproductive justice, sovereignty & incarceration: Prison abolition politics & California Indians. *American Indian Culture and Research Journal, 40*(1), 1. <https://doi.org/10.17953/aicrj.40.1.lumsden>
- McMahon, T. R., Hanson, J. D., Griese, E. R., & Kenyon, D. B. (2015). Teen pregnancy prevention program recommendations from urban and reservation northern plains American Indian community members. *American Journal of Sexuality Education, 10*(3), 218–241. <https://doi.org/10.1080/15546128.2015.1049314>
- Mitchell, C., Keane, E., Yazzie, L., Cottier, N., & Crow, C. B. (2000). *Pathways of choice survey*. <http://www.ucdenver.edu/academics/colleges/PublicHealth/research/centers/CAIANH/NCAIANMHR/ResearchProjects/Documents/choicerv.pdf>
- Rink, E., Bird, E. A. R., Fourstar, K., Ricker, A., Runs-Above, W., Meyers, A. A., & Hallum-Montes, R. (2016). Partnering with American Indian communities in strength-based collaborative health research: Guiding principles from the Fort Peck ceremony of research project. *American Indian and Alaska Native Mental Health Research, 23*(3), 187. <https://doi.org/10.5820/aian.2303.2016.187>
- StataCorp. (2015). *Stata 14.1*. Stata Corporation.
- Tingey, L., Chambers, R., Goklish, N., Larzelere, F., Lee, A., Suttle, R., Rosenstock, S., Lake, K., & Barlow, A. (2017). Rigorous evaluation of a pregnancy prevention program for American Indian youth and adolescents: Tudy protocol for a randomized controlled trial. *Trials, 18*(1), 89. <https://doi.org/10.1186/s13063-017-1842-6>
- White, J., Godfrey, J., & Iron Mocassin, B. (2006). American Indian fathering in the Dakota Nation: Use of Akicita as a fatherhood standard. *Fathering A Journal of Theory, Research, and Practice about Men as Fathers, 4*(1), 49–69. <https://doi.org/10.3149/ft.0401.49>
- Whitesell, N., Asdigian, N., Kaufman, C., Big Crow, C., Shangreau, C., Keane, E., Mousseau, A. C., & Mitchell, C. (2014). Trajectories of substance use among young American Indian adolescents: Patterns and predictors. *Journal of Youth and Adolescence, 43*(3), 437–453. <https://doi.org/10.1007/s10964-013-0026-2>