COMMUNITY-BASED PARTICIPATORY RESEARCH TO IMPROVE PRECONCEPTION HEALTH AMONG NORTHERN PLAINS AMERICAN INDIAN ADOLESCENT WOMEN

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Abstract: Background: *Sacred Beginnings is a community-based participatory research project that examines the effectiveness of a culturally appropriate preconception health educational intervention developed by tribal community members and elders. The primary goal is to increase knowledge of preconception health and its benefits among adolescent females and tribal communities. Preconception health is an area of considerable concern among American Indians (AIs) in the Northern Plains region, as there are high rates of birth, infant mortality, unintended pregnancy, teen pregnancy, and sexually transmitted diseases in this area. We examined the effectiveness of implementing this intervention during a residential summer program for AI high school students.* Materials and Methods: *The educational intervention consisted of 15 preconception health education sessions and was piloted during a summer high school residential academic program. The intervention (N = 39) and non-intervention (N = 38) groups were comprised of incoming AI female freshmen representing comparable demographics. A pre- and post-intervention survey was administered to both groups.* Results: *Results indicated a significant difference in Time 2 (T2; post-intervention) scores, with the intervention group scoring higher than the non-intervention group in overall preconception health knowledge and obesity knowledge. In terms of intra-group score analysis between Time 1 (T1; pre-intervention) and T2, there were significant changes within the intervention group in knowledge of obesity and diabetes. Knowledge changes in smoking were approaching significance. Within the non-intervention group, there was a significant change from T1 to T2 in scores for diabetes knowledge only.* Discussion: *The key finding was that the intervention group had higher overall preconception health knowledge at T2 compared to the non-intervention group. Intervention*

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participants demonstrated an understanding of how preconception behaviors may affect birth outcomes and maternal health. Another key finding was that, among participants in the intervention group, the change in knowledge regarding smoking beliefs between T1 and T2 were approaching significance. Because smoking during pregnancy is a risk factor for poor birth outcomes, this finding emphasizes that future curriculum modification should address the effects of smoking, and the benefits of smoking cessation, prior to or during pregnancy. Study limitations such as small sample size, high baseline health knowledge, the need to add traditional knowledge variables, and shortened implementation timeframe reveal key areas for improvement. Possible future intervention modifications include expanding on areas that reached or approached significance, implementing the intervention over a longer period of time, identifying ways to translate traditional knowledge into quantifiable survey measures, and implementing the intervention with high-risk, reservation-based populations of AI youth.

INTRODUCTION

Preconception health refers to women's health before pregnancy. Improved preconception health can have positive influences on the developing fetus and on birth outcomes (Brundage, 2002). Several risk factors involving personal behaviors, medical conditions, environmental exposures, and psychosocial issues can be identified and potentially modified prior to conception through intervention and increased knowledge. Additionally, prevention of some conditions, complications, and behaviors can only happen before conception (Johnson, Posner, Biermann, & Cordero, 2006).

Chronic conditions such as asthma, obesity, cardiac disease, hypertension, diabetes, and thyroid disorder have been associated with complications for women and infants. Moreover, 11% of all pregnant women reported smoking during pregnancy, which is a risk factor for low birth weight (Martin et al., 2003). According to a Centers for Disease Control and Prevention (CDC) report analyzing Behavioral Risk Factor Surveillance System responses from women (All Races) ages 18 to 44 years, alcohol consumption during pregnancy, which is a risk factor for fetal alcohol syndrome, was reported by 10% of pregnant women and 55% of women not using contraception effectively, regularly, or at all (CDC, 2002). High-risk behaviors for sexually transmitted diseases (STDs) were also reported by some women (CDC, 2001). Furthermore, minority and low socioeconomic status have been associated with persistent increased disparities in birth outcomes (Haas, Meneses, &

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McCormick, 1999; Johnson et al., 2006). More specifically, socioeconomic status has been shown to directly and indirectly affect access to health care, risky environmental exposures, and health behavior risks (Adler & Newman, 2002; Huynh, Parker, Harper, Pamuk, & Schoendork, 2005).

Among American Indian (AI) women, preconception health is of considerable concern, as AIs have high fertility rates and high infant mortality rates compared to other U.S. racial and minority groups. Among AI women of a Northern Plains tribe (which is representative of the sample being studied), there are persistent maternal and infant health disparities. According to a regional report of births between 2003 and 2005, AIs in this area have twice the birthrate and a 74% higher infant mortality rate than other women in the nation (All Races). In addition, in comparison to national rates (All Races), approximately 15% of AI infants have high birth weights; 37.6% of AI mothers report smoking during pregnancy, compared to 13.2% of other women in the nation; 5% of AI women report drinking alcohol during pregnancy, compared to 1% of other women; and 65% more AI women with diabetes gave birth than all other U.S. women. Finally, environmental factors influencing AI women and infant health include poverty (45% below federal poverty level), rural living, and political issues. Living in poverty has been known to adversely affect health in various ways; for example, poverty can cause or exacerbate barriers to accessing health resources, exposure to health hazards, inadequate diet, and stress-related illness (Rinki, Weng, & Richards, 2008). Due to the tremendous difficulties experienced by AI women, efforts have been made to increase their access to health care, reduce risk behaviors, and change provider practice to improve maternal and infant health. In addition, AI health programs have identified early intervention as important and necessary to ensure proper and thorough communication about preconception health care.

Early behavioral and educational intervention regarding preconception care can be effective in reducing risk factors (Korenbrot, Steinberg, Bender, & Newberry, 2002). Improving preconception health is of considerable interest as it not only improves reproductive health outcomes, but also has a substantial influence on societal costs (Committee on Perinatal Health, 1993; Institute of Medicine, 1985; Moos & Cefalo, 1987; U.S. Department of Health and Human Services, 1989). Correspondingly, the CDC has endorsed recommendations on improving preconception health. To meet these goals, education on the association between health risk factors and reproductive health should be improved to aid in changing knowledge, attitudes, and behaviors related to reproductive health (Moos, 2004). The Institute of Medicine, several national committees, and a number of professional organizations have established guidelines regarding preconception health care importance and content. It has been suggested that evidence-based information about preconception health be distributed and utilized at public programs and as a part of integrated services (Johnson et al., 2006).

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Use of culturally and linguistically appropriate systems of care to enhance preconception health care services, with the ultimate goal of providing comprehensive evidence-based preconception health care, has also been recommended (Johnson et al., 2006). One avenue of promoting culturally appropriate preconception health care is community-based participatory research (CBPR), which was developed to increase the effectiveness of health promotion and prevention programs by involving target communities in their design, implementation, and evaluation. CBPR is seen as a more effective approach than research implemented by non-community members, which rarely proves to be influential or significant (Robert Wood Johnson Foundation National Program Office on Diabetes, 2002).

Although there are recommendations, guidelines, and numerous procedures available for improving preconception health, efforts to improve pregnancy outcomes through behavior modification interventions that focus on comprehensive strategies for addressing multiple issues have been inconsistent and sparsely utilized (Atrash, Johnson, Adams, Cordero, & Howse, 2006). Additionally, few studies have examined women's behaviors before pregnancy; the majority of studies on women's preconception health are retrospective reports (Elsinga et al., 2008; Hellerstedt et al., 1998; Inskip et al., 2009; Prager, Malin, Spiegler, Van Natta, & Placek, 1984; Tough, Tofflemire, Clarke, & Newburn-Cook, 2006). For example, although many national, state, and local public health promotion campaigns have focused on reducing smoking, alcohol abuse, obesity, HIV/STDs, and other health risk behaviors, a majority of adults in the U.S. report limited awareness of how these health and other lifestyle decisions influence reproductive health (Roth & Taylor, 2001). One study examining women's perceptions, knowledge, and awareness of preconception health care reported that, although a majority of women understand the importance of optimizing their health prior to conception, they also have deficiencies in their knowledge of risk factors that impact maternal and fetal health (Frey & Files, 2006).

In sum, preconception health has become important because of the overall impact of women's health on birth outcomes and children's health, as well as on the associated societal costs. Recommendations to promote and increase preconception health have been made by many organizations, with a recent focus on utilizing community organization and participation. In accordance with recent preconception health recommendations, and due to a lack of empirical evidence, the present study focused on utilizing a culturally and community-focused CBPR project to improve preconception health knowledge among AI adolescent women.

The Sacred Beginnings Project is based at a Northern Plains Tribal Health Administration department and is administered entirely at the tribal level, with the Health Administrator serving as the Principal Investigator. Preconception care was designated as a high priority as the direct result of a regional 2007 Perinatal Infant Mortality Review (PIMR). The goals of this specific PIMR were

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to examine significant social, economic, cultural, safety, and health system factors associated with infant mortality through individual case review to identify causes of infant death and develop action plans for decreasing infant mortality; and to engage community members in the implementation of community-based policies and interventions to combat infant mortality. As a result of the PIMR, preconception counseling was identified as a strategy for decreasing infant mortality rates (Cuny, 2011).

The Tribal Health Administration designed a multiyear Native American Research Centers for Health proposal aimed at increasing preconception health awareness and preconception counseling visits as a mechanism to combat infant mortality. The CBPR framework included the development of a tribal working group, composed of community members who are knowledgeable in preconception health as well as cultural teachings. This working group was instrumental in the development of the Sacred Beginnings curriculum, which includes cultural teachings on healthy relationships, motherhood, and womanhood. The working group is currently composed of 12 individuals from the following community sectors: the tribal health and human services committee, Indian Health Services midwifery department, tribal home visiting program, parent council, family and child education program, tribal health education, and school administration, as well as cultural instructors, tribal court judge, and domestic violence prevention workers. Members meet once per quarter to provide input on all media messages, manuscripts, survey instruments, and other areas of project implementation.

Another CBPR method utilized early in project design was focus groups with various community populations. The focus groups were utilized to develop key media messages to increase community knowledge of preconception health. Project staff also asked different focus group participants their preferred means of mass communication. As a result, our outreach campaign includes tribal radio shows, social media networking, outreach booths at community events, and newsletters.

The CBPR framework also includes collaboration with the tribe's previously established Tribal Research Review Board to ensure that the project is being implemented in accordance with human rights protection and research protocol standards.

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MATERIALS AND METHODS

Preconception Health Intervention

A major component of the Sacred Beginnings Project is a preconception health intervention that targets middle school-age girls, 11-14 years old, and aims to increase their understanding of healthy versus harmful lifestyle choices that may affect pregnancy. The focus is on providing young women with vital information so that, when they are ready to be parents, they will improve their chances of having healthy infants.

Lakota Cultural Components

The intervention strives to increase knowledge of women's health by introducing key health topics, while incorporating Lakota teachings and beliefs. The most distinctive feature of the Sacred Beginnings intervention is the emphasis on Lakota cultural practices relating to preconception health, pregnancy, and parenting. The sessions of the curriculum that include Lakota teachings were authored by local Lakota elderly women who have a strong background not only in cultural knowledge but also in teaching that knowledge to youth.

The Lakota people are part of the *Oceti Sakowin* (Seven Council Fires), known today as The Great Sioux Nation. One of the cornerstones of the Lakota culture is the womanhood rite of passage ceremony, called the *Isnati*. The *Isnati*, while varying by region, is common to most bands of *Oceti Sakowin* and takes place after a young woman has her first menses. In the sessions of the intervention focused on the *Isnati*, participants learn about ceremony protocol and, most importantly, Lakota teachings on becoming a woman, motherhood, and parenting. For example, many Lakotas still strongly believe in the values brought to the people by the White Buffalo Calf Maiden. From this perspective, a woman respects herself and others; nurtures healthy relationships; cares for her family; and holds virtuousness, truthfulness, humor, wisdom, courage, and generosity in high regard (St. Pierre & Long Soldier, 1995. This teaching is especially important because it capitalizes on the role of the woman in traditional Lakota culture—specifically, how a woman should respect herself and expect a man to respect her as well.

It is our intention not only to educate young women about their culture, but also to evaluate how the Lakota value of respect (of both oneself and others) may be a protective factor against high-risk behaviors. For example, alcohol use has become a popular rite of passage in mainstream American culture. This intervention presents the unique opportunity to evaluate how traditional Lakota teachings might affect adolescent beliefs toward alcohol. The sessions of the curriculum focused on culture also emphasize that a young girl should view her menstruation as a sacred time

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that should be set aside to learn about her culture, values, and traditional skills such as beading, sewing, and quillwork (St. Pierre & Long Soldier, 1995). Many cultural teachings of this type have been passed down through generations via stories; in keeping with the oral tradition, instructors shared stories from the curriculum as well as their own personal experiences. In future versions of the curriculum, we hope to document more personal accounts of the *Isnati* and Lakota parenting as told by tribal elders.

Implementation and Location

The educational intervention consisted of a 15-session preconception health class that was taught two to three times per week throughout a 6-week summer residential education program (described below). Class sessions lasted approximately 45 minutes and were taught in small groups of 10-15 students. Topics included nutrition; fitness and exercise; diabetes; prescription medication abuse; STDs; Lakota cultural perspectives on womanhood, pregnancy, and parenting; and alcohol, tobacco, and drug use. This study examined the effectiveness of the intervention among incoming freshman females in the summer residential program.

The summer residential program, focusing on academic enrichment for low-income minority high school youth, was the host for the intervention. The program is based on a college campus and enrolls over 200 male and female students in grades 9-12 from across the state in which the Sacred Beginnings Project was developed. Approximately 85% of the camp's students are AI, and many are potential first-generation college students.

Participants

All incoming freshmen females whose parents attended the parent orientation were eligible to participate in the intervention, which was optional. Project staff presented an overview of the intervention during the parent orientation and collected signed consent and assent forms from parents and students after the orientation. A large number of parents were not present at the initial parent orientation, thus making their children ineligible for participation in the intervention. Both the intervention and non-intervention (control) groups were randomly drawn from the 77 students who signed assent forms and whose parents signed consent forms: 39 participants were assigned to the intervention group, and the remaining 38 to the control group.

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Survey Instrument

The pre- and post-intervention survey (see Appendix A) consisted of 98 questions that were administered in paper format. Question types included true/false, Likert scale, and multiple choice. Question topics included preconception health knowledge, e.g., understanding of how pre-pregnancy weight, nutrition, physical activity, and alcohol/substance use might affect a future pregnancy.

For purposes of data analysis, we measured the preconception health knowledge variable as the number of participants who correctly answered question 20 under the Growing and Preconception Health Perceptions section of the survey. This question asks "How important do you think the following items are to helping a young woman be prepared to have a healthy pregnancy and a healthy baby?" followed by a list of activities that participants can rate on a scale from 1 = *Important* to 3 = *Not important*. The complete list is included in Appendix A.

Other preconception health-related questions included topics such as relationships/sexual activity, HIV/AIDS and STD knowledge, self-esteem, peer influence, and cultural knowledge. CBPR methodology was utilized in survey development by gathering input from tribal working group members and community health professionals familiar with survey design and implementation.

We also incorporated questions from the Youth Risk Behavior Survey in the areas of violence-related behaviors, alcohol and drug use, physical activity, and body image. Our variables for the survey instrument were based on existing instruments customized to AI and/or adolescent female populations. Many variables were adapted from the Wiconi Teca Waste Youth Survey (Kaufman, 2005) and the Preconception Health Survey (Takahashi, 2007). Although the *Isnati* is a major component of the overall curriculum, the *Isnati* variable was incorporated into a single question on the survey instrument: "Are you familiar with the *Isnati* (Lakota womanhood ceremony)?" Because the survey utilized variables from existing instruments, we were unable to identify any traditional knowledge variables that could be incorporated. However, for future survey modifications, we will identify ways to translate traditional Lakota knowledge into quantifiable survey measures based on feedback from the working group and Lakota knowledge experts.

On the first day of class, the survey was administered to both the intervention and non-intervention groups. The intervention group began the preconception health sessions on the second day of class, while the non-intervention group attended other program classes such as college preparation, financial literacy, and tribal government. (The intervention group had the opportunity to take these classes at a different time.) Ideally, non-intervention students were not to be exposed to any class that had the same content as the intervention group. However, the non-intervention students attended a two-hour seminar on diabetes education, in which they received general information on diabetes, Body Mass Index, exercise, and nutrition. The intervention content was more in-depth

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and emphasized the effects of preconception behaviors on future birth outcomes. At the end of the summer program, the post-intervention survey was administered to both the intervention and non-intervention groups.

Data Management and Analysis

To secure confidentiality, pre- and post-intervention data were identified by a randomly assigned subject ID number. While each participant had the same ID number at pre- and post-intervention, we only looked at aggregate results for this analysis. Consents were kept in locked file cabinets in the project study office. Data were entered into a Microsoft Excel 2008 file and converted to an SPSS data file for analysis.

To examine whether receiving the intervention led to increased preconception health knowledge, paired-sample *t*-tests and independent-sample *t*-tests were computed. A paired-sample *t*-test was performed to examine the difference (post-survey or Time 2 [T2] minus pre-survey or Time 1 [T1] scores) within the intervention group and within the non-intervention group on the dependent variables: overall preconception health knowledge, alcohol knowledge, smoking knowledge, obesity knowledge, diabetes knowledge, and condom use knowledge.

In addition, an independent sample *t*-test was conducted to examine the difference between the intervention and non-intervention groups on T1 scores and T2 scores of the same dependent variables mentioned above. In this analysis, the independent variable was the preconception health intervention (intervention and non-intervention). An independent-sample *t*-test was also conducted to compare differences in the dependent variables (T2 minus T1 scores) for the preconception health intervention independent variable (preconception health intervention and non-intervention). None of the variables were significantly skewed and kurtotic; therefore, no data transformations were utilized.

Research Protocol Review

The Oglala Sioux tribe Research Review Board, which serves as the tribal human subjects review board, approved the study, as did the host program.

RESULTS

Our sample—both the intervention and non-intervention groups—consisted of 77 adolescent females. The intervention group started with 39 students; of those, 11 did not complete the intervention, leaving the intervention group with 28 participants. Of the 38 students in the non-intervention group at the beginning of the summer, 30 completed the post-intervention survey. The participants who did not complete the post-intervention survey either withdrew from the overall

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summer program voluntarily or were released due to disciplinary infractions. Of the 39 participants in the intervention group, 100% self-identified as AI (either solely or in combination with another race), and only one did not belong to a Lakota or Dakota band of the *Oceti Sakowin*). In the non-intervention group, 90% (n = 34) self-identified as AI.

Comparing T1 to T2 Differences in Knowledge of Preconception Health within the Intervention Group and within the Non-Intervention Group

Table 1 provides a comprehensive view of the number and percentage of respondents in both the intervention and non-intervention groups who reported knowledge in the key preconception health areas at T1 and T2. Results showed significant changes in T1 and T2 scores within the intervention group in knowledge of obesity (28% vs. 44%, $p = .01$) and diabetes (36% vs. 72%, $p = .02$). Knowledge changes in smoking (56% vs. 76%, $p = .07$) were approaching significance. In contrast, there were no significant differences in T1 and T2 knowledge of preconception health ($p = .20$), alcohol influence ($p = .38$), and use of condoms for protection ($p = .15$) within the intervention group.

Table 1
Paired Sample *t*-tests among Intervention Group and Non-intervention Group

	Time 1		Time 2		
	Percent*	N	Percent	N	*P* Value
			Intervention Group		
Preconception knowledge	93%	39	96%	25	0.20
Alcohol use	73%	37	87%	26	0.38
Smoking	56%	33	76%	23	0.07
Obesity	28%	36	44%	28	0.00
Diabetes	36%	37	72%	28	0.02
Condom use	75%	36	78%	26	0.15
			Non-intervention Group		
Preconception knowledge	90%	37	90%	29	0.97
Alcohol use	75%	38	81%	29	0.45
Smoking	57%	29	67%	30	0.42
Obesity	30%	36	33%	29	0.27
Diabetes	43%	37	63%	30	0.02
Condom use	76%	34	74%	28	0.36

* Percentage of participants who demonstrated knowledge relative to the specific variable in their specific group. The N variation between variables is attributed to skipped questions.

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Within the non-intervention group, there was a significant change from T1 to T2 in scores for diabetes knowledge (43% vs. 63%, $p = .02$). Conversely, there were no significant changes in T1 and T2 knowledge of preconception health ($p = .97$), alcohol influence ($p = .45$), smoking ($p = .42$), obesity ($p = .27$), and use of condoms for protection ($p = .36$) within the non-intervention group.

Comparing T2 Changes in Knowledge of Preconception Health between the Intervention Group and the Non-Intervention Group

There was a significant difference in knowledge at T2 between the two groups, with the intervention group scoring higher than the non-intervention group in overall preconception health knowledge (96% vs. 90%, $p = .03$) and obesity knowledge (44% vs. 33%, $p = .01$; see Table 2). There were no significant differences in T2 scores between the intervention and non-intervention groups on knowledge of alcohol (87% vs. 81%, $p = .33$, smoking (76% vs. 67%, $p = .35$), diabetes (72% vs. 63%, $p = .34$, or use of condoms for protection (78% vs. 74%, $p = .12$).

Table 2
Independent Sample *t*-test for Intervention and Non-intervention Dependent Variable T2 Differences

	Intervention Group		Non-intervention Group		
	Percent	N	Percent	N	P Value
Preconception knowledge	96%	25	90%	29	0.03
Alcohol use	87%	26	81%	29	0.33
Smoking	76%	23	67%	30	0.35
Obesity	44%	28	33%	29	0.01
Diabetes	72%	28	63%	30	0.34
Condom use	78%	26	74%	28	0.12

Comparing T1 to T2 Differences in Knowledge of Preconception Health between the Intervention Group and the Non-Intervention Group

Results showed no significant differences in mean (M) values between the intervention group and non-intervention groups' scores (T2 minus T1) regarding knowledge of overall preconception health ($M = .84$ vs. $M = 0.04$, $p = .52$), alcohol influence ($M = 0.38$ vs. $M = 0.38$, $p = 1.00$), smoking influence ($M = 1.11$ vs. $M = 0.67$, $p = .66$), obesity ($M = 1.85$ vs. $M = 0.63$, $p = .09$), diabetes ($M = 1.26$ vs. $M = 1.10$, $p = .78$), and use of condoms for protection ($M = 1.52$ vs. $M = -1.17$, $p = .11$; see Table 3). Of note, there were no T1 differences between the intervention and non-intervention groups.

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Table 3
Independent Sample *t*-test for Intervention and Non-intervention Dependent Variable Differences (T2 minus T1 scores)

	Intervention Group			Non-intervention Group			
Variable	***M***	***SD***	**N**	***M***	***SD***	**N**	***P* Value**
Preconception knowledge	0.84	3.20	25	0.04	5.43	28	0.52
Alcohol use	0.38	2.06	24	0.38	2.65	29	1.00
Smoking	1.11	2.42	18	0.67	3.41	18	0.66
Obesity	1.85	2.09	26	0.63	2.91	27	0.09
Diabetes	1.26	1.89	27	1.10	2.30	29	0.78
Condom use	1.52	4.93	23	-1.17	6.11	24	0.11

DISCUSSION

Efforts to improve pregnancy outcomes through behavior modification interventions have been inconsistent and ineffectively utilized (Atrash et al., 2006). In addition, many adults in the U.S. are not fully aware of how risk behaviors can affect reproductive health (Roth & Taylor, 2001). Therefore, it is recommended that general health education in school be improved to promote reproductive awareness; however, no studies have examined the influence of a preconception health intervention among AI adolescent females. Thus, the current study examined the influence of a CBPR preconception health intervention among AI adolescent females. We focused on overall preconception health knowledge as well as on specific knowledge of the effects of alcohol, smoking, obesity, diabetes, and use of condoms for protection on women's health prior to pregnancy and how their behaviors may affect birth outcomes. To our knowledge, this is the first study to implement a culturally specific preconception intervention.

Our findings show a promising trend toward increased preconception health knowledge after the intervention, both within the intervention group and in the change in post-survey (T2) measurement between the intervention and non-intervention groups. Data indicate that there were significant increases in diabetes and obesity knowledge within the intervention group. In contrast, within the non-intervention group, significant changes were demonstrated only in diabetes knowledge scores. On the post-survey, the intervention group displayed significantly more changes in overall preconception health knowledge and obesity knowledge as compared to the non-intervention group.

These results further demonstrate the need for a community-based preconception health education intervention to increase preconception health knowledge. Previous literature has shown a lack of knowledge of preconception risk factors (Frey & Files, 2006) and the limited influence

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of health promotion campaigns on preconception and reproductive health (Roth & Taylor, 2001). However, participants in the current study who received the intervention had an increase in post-survey scores for diabetes and obesity, in contrast to those in the non-intervention group, who only demonstrated changes in post-survey scores for diabetes. It is important to note that the participants who did not receive the intervention nonetheless attended a diabetes prevention group, which may account for the change in their diabetes knowledge. Despite a change in diabetes knowledge, the non-intervention group's post-survey knowledge of obesity did not change. Obesity is related to diabetes; however, the specific repercussions of being overweight in relation to reproduction health were not covered in the diabetes prevention class that the non-intervention group received. These issues were discussed in detail in relation to preconception health in the intervention group. In addition, the intervention group had higher overall preconception health knowledge on the post-survey, compared to the non-intervention group. Thus, they may already have had a broad understanding of the negative influence of alcohol, diabetes, smoking, and condom use on preconception health, as these are general health risks. Yet, an understanding about the specific influence of the more intricate health risks associated with reproductive health would be useful in expanding preconception health knowledge. Lastly, participants (in both the intervention and non-intervention groups) initially perceived their health to be fair (23%, n = 18), good (48%, n = 37), or excellent (29%, n = 22). This finding indicates that participants may have had a partial understanding of general health knowledge. We do not know if we would discover the same baseline knowledge level in a less resilient or reservation-based sample.

Another key finding among the intervention group was that knowledge regarding smoking beliefs between T1 and T2 was approaching significance. Tobacco use is related to enormous health disparities among Northern Plains tribes. Considering that almost 40% of Northern Plains AI mothers report smoking during pregnancy (Rinki et al., 2008), and smoking during pregnancy is a risk factor for sudden infant death syndrome and other poor birth outcomes, this finding emphasizes that future curriculum modification should expand on the effects of smoking on preconception health—specifically, how preconception smoking beliefs can lead to further smoking during pregnancy or, conversely, to smoking cessation during pregnancy. Collaboration among tobacco programs and tribal health departments in addressing the importance of tobacco prevention/cessation during the preconception period could be helpful.

Limitations

Small sample size and the short period between pre- and post- surveys may have limited our ability to show a difference between the groups in any preconception health areas. We were initially limited to less than 40 participants per group. At the conclusion of the intervention, however, we had

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lost 19 participants, resulting in only 48 total participants who took the post- survey. The attrition rates of the intervention and non-intervention groups were 28% and 21%, respectively. The attrition rates and small sample size may indicate that the areas approaching significance, such as smoking knowledge, could have been significant in a larger sample.

The condensed time frame in which the intervention was implemented was another limitation. The curriculum originally was designed as a semester-long education intervention, whereas the host program only allowed a 5-week intervention. As a result, the students may not have had adequate time to capture the full benefits of the intervention. In addition, the teaching style encouraged discussion among participants. The disadvantage of this teaching style was that some students felt uncomfortable speaking in front of others and were less inclined to participate. These students did not participate in class discussions until they were more comfortable with their peers, limiting conversation to the latter half of the intervention. Future intervention efforts will include other methods of engaging students, such as small-group talking circles and journaling discussion.

Another limitation was that the participants in our sample were from an academic enrichment summer program; students had to fill out an application, write an essay, submit letters of recommendation, and report their grades in order to be admitted. It is important to note the distinctive feature of this sample of AI youth, as their baseline preconception health knowledge may have been influenced by factors such as high educational performance, supportive home environment, higher socioeconomic status (relative to other AI youth), and/or a preexisting healthy lifestyle. An additional limitation was that we only sampled students whose parents or guardians attended an orientation and gave consent; this process may have excluded students who have limited parental involvement. This possibility is significant because parental involvement is a major factor in helping teens avoid high-risk behaviors such as alcohol and drug use and sexual activity (U.S. Council of Economic Advisers, 2000).

Furthermore, the measurement scores for the different dependent variables were not uniform; some measures had more questions and, therefore, higher scores than others. Having a similar number of questions for each dependent variable would have given a better understanding of the dependent variables compared to each other. As the curriculum is still being developed and revised, future intervention protocols should emphasize each dependent variable's influence on preconception health, to ensure that this topic remains the primary focus of the course.

As mentioned previously, an especially crucial limitation was the inadequacy of the survey instrument in capturing cultural knowledge gained by the participants. The intervention incorporated several cultural components (especially the Isnati womanhood ceremony) that could positively influence behavior. Future survey instrument modifications will focus on identifying ways to translate traditional knowledge into quantifiable survey measures.

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Lastly, there is also a possibility that our sample was exposed to one or more health education classes during the summer program prior to our intervention. Although we made every attempt to isolate our sample from other classes that might offer content similar to that in our curriculum, our data may have also been skewed as a result of the closed environment (i.e., shared dorm rooms, mixed classes, small campus) shared by the intervention and non-intervention participants. Students may have discussed health information outside of class and been influenced by others' perceptions and knowledge.

Next Steps

The fact that intervention subjects were exposed to knowledge of traditional Lakota practices is of great importance, as Sacred Beginnings is a CBPR project. Future steps toward quality improvement include identifying ways to demonstrate the effectiveness of incorporating traditional Lakota teachings into our intervention activities. We hope to emphasize how CBPR methodology not only promotes behavior change but also empowers Indigenous populations through cultural revitalization.

High birth rates, coupled with challenging social and behavioral determinants of health, bear negatively on AI women's birth and reproductive health outcomes. Further research is needed to demonstrate the effectiveness of educational interventions in promoting behavior change and increasing preconception health knowledge in AI populations. Specifically, research is needed to focus on reservation-based AI populations that are at higher risk for poor reproductive and birth outcomes. The results of this intervention, coupled with the limitations (namely, the high attrition rate of an already small sample size and the high baseline knowledge of our sample), suggest that we might be able to show change in different populations of Native youth.

Our education intervention was, to our knowledge, the first of its kind to incorporate a traditional AI perspective on preconception health in promoting behavior change in an academic environment. While the results did not indicate a significant increase in knowledge in all curriculum areas, there was an overall change in post-survey preconception health knowledge and obesity knowledge for the intervention group compared to the non-intervention group, as well as a positive response to the incorporation of traditional Lakota teachings. Further research is needed to demonstrate whether the retention and comprehension of traditional preconception knowledge positively affects reproductive and birth outcomes. In the future, we plan to evaluate our intervention in a traditional middle or high school environment over the course of one or two semesters. In this setting, adequate time will be available to elaborate on measures that were approaching significance.

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Appendix A
Sacred Beginnings Preconception Health Survey

Sacred Beginnings Project

Preconception Health Survey

Sacred Beginnings/Otokahe Wakan Project

Thank you for helping us by answering these questions! Your honest answers are very important to us. There are a few things to keep in mind as you answer the questions.

- Many questions are personal and sensitive. *We truly appreciate your honest answers!!*
- We will not tell anyone what your answers are. Even if you tell us about illegal activities like using drugs or alcohol, we won't tell anyone.
- You can skip any question.
- You can stop at any time.
- Please mark the answers as best you can even if the question doesn't seem to apply to you.
- Please pay special attention to whether we ask about the last month, the last year, the first time you did something, or the last time you did something. We will bold the timeframe, to help you remember.
- There are no right or wrong answers, and you will not be graded on your answers.

Look for arrows (→) to explain section directions.

Who Am I?

→ **Please circle your answer for each of the following questions**

1. Your ethnicity/race or cultural group is **(Select one or more responses)**:
   A. American Indian/Alaska Native
   B. Asian or Asian American
   C. Black or African-American
   D. Hispanic or Latino
   E White, Caucasian, European (not Hispanic)

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Appendix A, Continued
Preconception Health Survey

2. Are you an enrolled member of _____ Tribe?
   A. No
   B. Yes

3. Are you an enrolled member of some other tribe?
   A. No
   B. Yes
   (If "Yes", Please name the tribe:_____)

4. In what grade are you?
   A. 6th grade
   B. 7th grade
   C. 8th grade
   D. Ungraded or other grade

5. What is your highest educational goal?
   A. I don't have any goals
   B. Complete my current year of school
   C. Graduate from high school
   D. Go into the military
   E. Go to college
   F. Graduate from college
   G. Go to more school after graduating from college

6. In general, would you say your health is...
   A. Poor
   B. Fair
   C. Good
   D. Excellent

→ **For the next part, please circle the number that best describes how much you agree or disagree with each statement.** For example:

	Strongly Disagree	Somewhat Disagree	Somewhat Agree	Strongly Agree
I like the color blue.	1	2	3	(4)

(This person shows that blue is a favorite color, by circling "4" to strongly agree)

	Strongly Disagree	Somewhat Disagree	Somewhat Agree	Strongly Agree
7. Being a part of my tribe or cultural group is important to me	1	2	3	4

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Appendix A, Continued
Preconception Health Survey

	Strongly Disagree	Somewhat Disagree	Somewhat Agree	Strongly Agree
8. I have a lot of pride in my tribe or cultural group	1	2	3	4
9. I speak or am learning to speak my tribal or cultural language	1	2	3	4
10. I listen, sing, or dance to traditional music	1	2	3	4
11. I feel good about my cultural and tribal background	1	2	3	4
12. I feel that I have many good qualities	1	2	3	4
13. I have a positive attitude	1	2	3	4
14. I think I am no good at all	1	2	3	4
15. I am satisfied with myself and my body	1	2	3	4

Friends

We are now going to ask you a few questions about your friends.

→ **Please circle the number that best describes your friends.**

How many of your friends...

	None	A few	Some	Many	Almost all or all
1. ...encourage you to disobey your parents?	1	2	3	4	5
2. ...volunteer or participate in community groups, like youth groups?	1	2	3	4	5
3. ...try to get you to do dangerous things?	1	2	3	4	5
4. ...get in trouble at school?	1	2	3	4	5
5. ...go to sweat/ceremony or church regularly?	1	2	3	4	5
6. ...get in a lot of fights with other kids?	1	2	3	4	5
7. ...think schoolwork is very important?	1	2	3	4	5
8. ...plan to go to college?	1	2	3	4	5

Growing and Preconception Health Perceptions

→ **Please circle or mark your answer for each of the following questions**

16. Have you ever had a menstrual period (been on your moon)?
    A. No
    B. Yes

17. How old were you when you had your very first menstrual period (first had your moon)?
    _____ Years old
    _____ I haven't had my period yet

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Appendix A, Continued
Preconception Health Survey

18. Are you familiar with the Isnati (womanhood ceremony)?

    A. No
    B. Yes
    C. Not sure

19. Have you participated in an Isnati (womanhood ceremony)?

    A. No
    B. Yes
    C. Not sure

20. How important do you think the following items are to helping a young woman be prepared to have a healthy pregnancy and a healthy baby?

Please circle the number that best describes the level of importance of the following phrases in helping young women to be well and healthy.

	Important	Somewhat Important	Not Important
A. Eating healthy foods	1	2	3
B. Being smoke and tobacco free	1	2	3
C. Not drinking alcohol	1	2	3
D. Being drug free	1	2	3
E. Taking vitamins	1	2	3
F. Seeing a doctor annually for a health check-up	1	2	3
G. Getting regular exercise	1	2	3
H. Staying a healthy weight	1	2	3
I. Abstaining from sexual activity	1	2	3
J. Avoiding unplanned pregnancies	1	2	3
K. Learning about Lakota culture and traditions for health and family	1	2	3

21. When do you think the best age is for woman to have her first baby? **(Circle one answer)**

    A. Age 12-15
    B. Age 16-18
    C. Age 18-21
    D. Age 22-29
    E. Age 30 or older

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Appendix A, Continued
Preconception Health Survey

Preconception Health Knowledge

Do you think the following statements are true or false?
→ **Circle the answer that you believe is correct**

Sexually Transmitted Diseases (STDs):

1. All sexually transmitted diseases (STDs) are curable	No	Yes	Unsure
2. Worldwide, HIV/AIDS is mostly a gay disease	No	Yes	Unsure
3. Condoms can help protect a person from getting STDs	No	Yes	Unsure
4. People only get HIV/AIDS by having sex with someone they don't know very well	No	Yes	Unsure
5. Some STDs can be gotten by kissing an infected person	No	Yes	Unsure
6. The HIV/AIDS virus attacks people's immune system; then, their bodies can't protect them from diseases any more	No	Yes	Unsure
7. Getting bit by a mosquito is a way to spread HIV/AIDS	No	Yes	Unsure
8. You can usually tell by looking at people if they have HIV/AIDS	No	Yes	Unsure
9. A mother with HIV/AIDS can pass it on to her baby by breast-feeding	No	Yes	Unsure
10. People can get shots to protect them from ever getting HIV/AIDS	No	Yes	Unsure
11. Showering or washing one's genitals or private parts after sex keeps a person from getting HIV/AIDS	No	Yes	Unsure
12. Abstinence, which means not having any kind of sex, is the best way to avoid getting HIV/AIDS and most other sexually transmitted diseases (STDs)	No	Yes	Unsure

Alcohol Consumption:

13. Alcohol can cause short-term and long-term damage to your body	No	Yes	Unsure
14. Drinking alcohol during pregnancy increases the chances of having a baby with:			
A. Reduced intellectual development	No	Yes	Unsure
B. Behavioral problems	No	Yes	Unsure
C. Lowered function of brain and spinal cord	No	Yes	Unsure
D. Facial abnormalities	No	Yes	Unsure
E. Slower physical growth	No	Yes	Unsure

Smoking:

15. The tobacco in cigarettes contains thousands of chemicals, including stuff that's in batteries, rat poison, and car exhaust	No	Yes	Unsure
16. Smoking during pregnancy increases the chances of:			
A. Giving birth early	No	Yes	Unsure

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Appendix A, Continued
Preconception Health Survey

B. Small/underweight babies	No	Yes	Unsure
C. A baby dying before they are born	No	Yes	Unsure
D. A baby dying after they are born	No	Yes	Unsure
E. Harm to mother or baby during baby's development	No	Yes	Unsure
F. Sudden Infant Death Syndrome (SIDS)	No	Yes	Unsure
Mental Health:			
17. A mother's mental health and emotional well-being can affect a baby's health	No	Yes	Unsure
Overweight and Obesity:			
18. Women who are overweight (Body Mass Index [BMI] of 25-29.9 kg/m^2) or obese (BMI $\geq$ 30) before getting pregnant have an increased chance of:	No	Yes	Unsure
A. Not being able to have children	No	Yes	Unsure
B. Diabetes	No	Yes	Unsure
C. High blood pressure	No	Yes	Unsure
D. Circulatory problems	No	Yes	Unsure
E. Needing medication to bring on labor	No	Yes	Unsure
F. Cesarean section (C-section)	No	Yes	Unsure
G. Having trouble with breastfeeding	No	Yes	Unsure
H. Keep the weight gained during pregnancy after giving birth	No	Yes	Unsure
19. Problems for the developing baby of an overweight or obese mother include:			
A. Death of a developing baby or newborn	No	Yes	Unsure
B. Abnormally large baby	No	Yes	Unsure
C. Birth defects, including heart defects	No	Yes	Unsure
D. Prematurity and/or small	No	Yes	Unsure
E. Childhood obesity	No	Yes	Unsure
Diabetes:			
20. Diagnosis and management of diabetes before getting pregnant and throughout pregnancy reduce the likelihood of:			
A. Miscarriage (losing the baby in early pregnancy)	No	Yes	Unsure
B. A baby dying before they are born	No	Yes	Unsure
C. Abnormally large baby	No	Yes	Unsure
D. Birth defects	No	Yes	Unsure

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Appendix A, Continued
Preconception Health Survey

School Programs:

We are going to ask you about some of the things that you may be learning about in school. Think about all your classes over the **last 4 weeks** while you were at school.

1. Do you remember learning about any of these topics in the last **4 weeks**?
   → **Circle Yes or No for each topic**

A. Self-esteem, decision-making, or values	No	Yes
B. Human growth or changes in your body as you grow up	No	Yes
C. Relationships with the opposite sex	No	Yes
D. What to do in risky situations such as parties with alcohol or drugs, or driving with someone who is drunk	No	Yes
E. A disease called HIV or AIDS	No	Yes
F. Diseases called sexually transmitted diseases, or STD's	No	Yes
G. Drugs or alcohol?	No	Yes

IF YOU ANSWERED "NO" TO ALL OF A-G ABOVE, SKIP TO NUMBER 4 ON THE NEXT PAGE

2. Who led most of the discussion(s)? **(Circle one or more responses)**
   A. Sacred Beginnings Class Instructor
   B. Another class instructor
   C. An adult from outside the school
   D. A young person or a group of young people, about your age
   E. Other. Please list: _____
   F. A family member

3. Think about the topics you marked A-G in number 1, above. In the **last 4 weeks of school**, how did you hear about these topics? **Circle Yes or No for each topic**

A. During the Sacred Beginnings class (including guest speakers)	No	Yes
B. During another class	No	Yes
C. Someone from outside the school came in and gave a special presentation for the whole school, such as at an assembly (not a Sacred Beginnings guest speaker)	No	Yes
D. Someone from outside the school came in and gave a special presentation, but just during one of my regular classes (not the Sacred Beginnings class)	No	Yes
E. Other. Please list _____	No	Yes

4. Before now, have you EVER been taught about AIDS or HIV in school?
   A. No
   B. Yes

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Appendix A, Continued
Preconception Health Survey

Attitudes and Opinions about Condoms:

→ **Please circle the number that best describes how sure you are about each statement. If you haven't had sex, mark how you think you would handle these situations.** There are no right or wrong answers. Just give your honest opinion.

	I would not do this	Not very sure	Kind of sure	**Completely sure I would** do this
	1	2	3	4
1. I would use a condom if I had sex with someone new	1	2	3	4
2. If neither of us had a condom, we would get one before we had sex	1	2	3	4
3. If I were turned on and about to have sex, I would forget to use a condom	1	2	3	4
4. If there was a chance that I was going to have sex, I'd make sure we used a condom	1	2	3	4
5. I know where to get condoms	1	2	3	4
6. I can get condoms whenever I want	1	2	3	4
7. I could use a condom correctly	1	2	3	4
8. I wouldn't mind going to the school nurse or clinic to get condoms	1	2	3	4
9. I can see myself buying condoms at a gas station or store	1	2	3	4
10. I would use a condom even if I were already using another kind of birth control	1	2	3	4

The next section of the survey will ask you to answer questions about your behavior. Answering the questions based on what you really do will help to improve health education for young people like yourself.

→ **Please circle your answer for each of the following questions**

The next 4 questions ask about violence-related behaviors.

1. Have you ever carried a **weapon**, such as a gun, knife, or club?
   A. Yes
   B. No

2. Have you ever been in a physical fight?
   A. Yes
   B. No

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Appendix A, Continued
Preconception Health Survey

3. Have you ever been in a physical fight in which you were hurt and had to be treated by a doctor or nurse?

   A. Yes
   B. No

4. During the past 12 months, did your boyfriend ever hit, slap, or physically hurt you?

   A. Yes
   B. No
   C. I haven't had a boyfriend in the last 12 months.

The next 8 questions ask about tobacco use.

5. Have you ever tried cigarette smoking, even one or two puffs?

   A. Yes
   B. No

6. How old were you when you smoked a whole cigarette for the first time?

   A. I have never smoked a whole cigarette
   B. 8 years old or younger
   C. 9 years old
   D. 10 years old
   E. 11 years old
   F. 12 years old
   G. 13 years old or older

7. During the past **30 days**, on how many days did you smoke cigarettes?

   A. 0 days
   B. 1 or 2 days
   C. 3 to 5 days
   D. 6 to 9 days
   E. 10 to 19 days
   F. 20 to 29 days
   G. All 30 days

8. During the past **30 days**, on the days you smoked, how many cigarettes did you smoke **per day**?

   A. I did not smoke cigarettes during the past 30 days
   B. Less than one cigarette per day
   C. 1 cigarette per day
   D. 2 to 5 cigarettes per day
   E. 6 to 10 cigarettes per day
   F. 11 to 20 cigarettes per day
   G. More than 20 cigarettes per day

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Appendix A, Continued
Preconception Health Survey

9. During the past **30 days**, how did you **usually** get your own cigarettes? (Select only **one** response.)

   A. I did not smoke cigarettes during the past 30 days
   B. I bought them in a store such as a convenience store, supermarket, discount store, or gas station
   C. I bought them from a vending machine
   D. I gave someone else money to buy them for me
   E. I borrowed (or bummed) them from someone else
   F. A person 18 years old or older gave them to me
   G. I took them from a store or family member
   H. I got them some other way

10. Have you ever smoked cigarettes **daily**, that is, at least one cigarette every day for 30 days?

   A. Yes
   B. No

11. During the past **30 days**, on how many days did you use **chewing tobacco, snuff, or dip** such as Redman, Levi Garrett, Beechnut, Skoal, Skoal Bandits, or Copenhagen?

   A. 0 days
   B. 1 or 2 days
   C. 3 to 5 days
   D. 6 to 9 days
   E. 10 to 19 days
   F. 20 to 29 days
   G. All 30 days

12. During the past **30 days**, on how many days did you smoke **cigars, cigarillos, or little cigars**?

   A. 0 days
   B. 1 or 2 days
   C. 3 to 5 days
   D. 6 to 9 days
   E. 10 to 19 days
   F. 20 to 29 days
   G. All 30 days

The next 2 questions ask about drinking alcohol. This includes drinking beer, wine, wine coolers, and liquor such as rum, gin, vodka, or whiskey. For these questions, drinking alcohol does not include drinking a few sips of wine for religious purposes.

13. Have you ever had a drink of alcohol, other than a few sips?

   A. Yes
   B. No

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Appendix A, Continued
Preconception Health Survey

14. How old were you when you had your first drink of alcohol other than a few sips?
    A. I have never had a drink of alcohol other than a few sips
    B. 8 years old or younger
    C. 9 years old
    D. 10 years old
    E. 11 years old
    F. 12 years old
    G. 13 years old or older

The next 2 questions ask about marijuana use. Marijuana also is called grass or pot.

15. Have you ever used marijuana?
    A. Yes
    B. No

16. How old were you when you tried marijuana for the first time?
    A. I have never smoked a whole cigarette
    B. 8 years old or younger
    C. 9 years old
    D. 10 years old
    E. 11 years old
    F. 12 years old
    G. 13 years old or older

The next 4 questions ask about other drugs.

17. Have you ever used **any** form of cocaine, including powder, crack, or freebase?
    A. Yes
    B. No

18. Have you ever sniffed glue, breathed the contents of spray cans, or inhaled any paints or sprays to get high?
    A. Yes
    B. No

19. Have you ever taken **steroid pills or shots** without a doctor's prescription?
    A. Yes
    B. No

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Appendix A, Continued
Preconception Health Survey

20. Have you ever taken a **prescription drug** (such as OxyContin, Percocet, Vicodin, codeine, Adderall, Ritalin, or Xanax) without a doctor's prescription?
    A. Yes
    B. No

The next 4 questions ask about sexual intercourse.

21. Have you ever had sexual intercourse?
    A. Yes
    B. No

22. How old were you when you had sexual intercourse for the first time?
    A. I have never had sexual intercourse
    B. 8 years old or younger
    C. 9 years old
    D. 10 years old
    E. 11 years old
    F. 12 years old
    G. 13 years old or older

23. With how many people have you ever had sexual intercourse?
    A. I have never had sexual intercourse
    B. 1 person
    C. 2 people
    D. 3 people
    E. 4 people
    F. 5 people
    G. 6 or more people

24. The **last time** you had sexual intercourse, did you or your partner use a condom?
    A. I have never had sexual intercourse
    B. Yes
    C. No

The next 5 questions ask about body weight

25. How do **you** describe your weight?
    A. Very underweight
    B. Slightly underweight
    C. About the right weight
    D. Slightly overweight
    E. Very overweight

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Appendix A, Continued
Preconception Health Survey

26. Which of the following are you trying to do about your weight?
    A. **Lose** weight
    B. **Gain** weight
    C. **Stay** the same weight
    D. I am **not trying to do anything** about my weight

27. Have you ever **gone without eating for 24 hours or more** (also called fasting) to lose weight or keep from gaining weight?
    A. Yes
    B. No

28. Have you ever **taken any diet pills, powders, or liquids** without a doctor's advice to lose weight or keep from gaining weight? (Do **not** include meal replacement products such as Slim Fast.)
    A. Yes
    B. No

29. Have you ever **vomited or taken laxatives** to lose weight or keep from gaining weight?
    A. Yes
    B. No

The next 5 questions ask about physical activity

30. During the past 7 days, on how many days were you physically active for a total of **at least 60 minutes per day**? (Add up all the time you spent in any kind of physical activity that increased your heart rate and made you breathe hard some of the time.)
    A. 0 days
    B. 1 day
    C. 2 days
    D. 3 days
    E. 4 days
    F. 5 days
    G. 6 days
    H. 7 days

31. On an average school day, how many hours do you watch TV?
    A. I do not watch TV on an average school day
    B. Less than 1 hour per day
    C. 1 hour per day
    D. 2 hours per day
    E. 3 hours per day
    F. 4 hours per day
    G. 5 or more hours per day

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Appendix A, Continued
Preconception Health Survey

32. On an average school day, how many hours do you play video or computer games or use a computer for something that is not school work? (Include activities such as Xbox, PlayStation, Nintendo DS, iPod Touch, Facebook, and the Internet.)

    A. I do not play video or computer games or use a computer for something that is not school work
    B. Less than 1 hour per day
    C. 1 hour per day
    D. 2 hours per day
    E. 3 hours per day
    F. 4 hours per day
    G. 5 or more hours per day

33. In an average week when you are in school, on how many days do you go to physical education (PE) classes?

    A. 0 days
    B. 1 day
    C. 2 days
    D. 3 days
    E. 4 days
    F. 5 days

34. During the past 12 months, on how many sports teams did you play? (Count any teams run by your school or community groups.)

    A. 0 teams
    B. 1 team
    C. 2 teams
    D. 3 or more teams

The next 2 questions ask about other health-related topics.

35. Has a doctor or nurse ever told you that you have asthma?

    A. I have never had asthma
    B. Yes
    C. No
    D. Not sure

36. Do you still have asthma?

    A. I have never had asthma
    B. Yes
    C. No
    D. Not sure

This is the end of the survey. Thank you very much for your help!

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