Published in final edited form as:

Alcohol Clin Exp Res. 2020 January ; 44(1): 196–202. doi:10.1111/acer.14229.

Acceptability of an eHealth intervention to prevent alcohol exposed pregnancy among American Indian/Alaska Native teens

Jessica D. Hanson, PhD¹, Tess L. Weber, MPH², Umit Shrestha, PhD³, Valerie J. Bares, PhD², Michaela Seiber, MPH², Karen Ingersoll, PhD⁴

¹.University of Minnesota Duluth, Duluth, MN USA

².Sanford Research, Sioux Falls, SD USA

³.Colorado School of Public Health, Aurora, CO USA

⁴.University of Virginia School of Medicine, Charlottesville, VA USA

Abstract

Introduction—A tribally-led CHOICES (Changing High-Risk Alcohol Use and Increasing Contraception Effectiveness Study) Program has successfully decreased the risk of alcohol-exposed pregnancies (AEPs) among adult American Indian/Alaska Native (AI/AN) women by either reducing risky drinking or increasing contraception use. However, a community needs assessment revealed a need to implement a similar intervention with AI/AN teens. The goal of the project was to develop and establish the acceptability of CHOICES for AI/AN teens.

Methods—Key-informant interviews were conducted to review the existing OST CHOICES intervention. After modifications to the existing program, focus groups with AI/AN teens were conducted to ensure validity and to finalize the OST CHAT (CHOICES for American Indian Teens) intervention.

Results—Key-informant (N=15) participants suggested that a web-based intervention may increase teen engagement by making the intervention more interactive and visually stimulating. Based on this formative research, CHAT was developed via REDCap (Research Electronic Data Capture). Feedback on the online CHAT curriculum was given by focus groups comprised of AI/AN adolescents, and participants felt that this type of intervention would be both acceptable and able to implement with a community of reservation-based teens.

Conclusions—This study outlines the development of a web-based intervention for an AEP intervention for AI/AN teens and will inform future prevention efforts. Implications include an expansion of the evidence-based CHOICES intervention for AI/AN teens and also development of a web-based intervention for rural, reservation-based AI/AN communities.

Keywords

Alcohol-exposed pregnancy; REDCap; American Indian; teens/adolescents

Background

Prenatal alcohol consumption is a public health concern due to the potential lifelong physical and cognitive effects in offspring, often presenting in the form of fetal alcohol syndrome (FAS) or other fetal alcohol spectrum disorders (FASDs) (May et al., 2004, Tan et al., 2015). Rates of FAS among Great Plains American Indians/Alaska Natives (AI/AN) range as high as 9 per 1,000 live births (May et al., 2004), although more recent literature on FASD surveillance found no difference in FAS diagnosis by race (May et al., 2018) and a study with one AI/AN community found rates of FASD similar to that of the general population (Montag et al., 2019). In addition, drinking during pregnancy is higher among some subpopulations compared to other communities. For example, one study found 16.2% of Great Plains AI/AN women seen at a prenatal clinic reported drinking alcohol during pregnancy (May et al., 2004), in contrast to a national study which found that 10.2% of pregnant women drank (Tan et al., 2015). However, estimating rates of prenatal alcohol exposure varies based on how data is collected, and more surveillance data is needed.

Because damage from alcohol exposure often occurs before pregnancy recognition, preconceptional alcohol-exposed pregnancy (AEP) risk reduction is crucial, especially when pregnancy is unintended (Floyd et al., 1999). A preconceptional approach might be particularly important with adolescents, especially AI/AN youth, given that few teen pregnancies are planned and experimentation with substances is typically initiated in this age group. For example, while teen pregnancy has generally been decreasing (Hamilton et al., 2013), 21% of AI/AN teen girls become mothers compared to 16% of teen girls nationwide (The National Campaign to Prevent Teen Pregnancy, 2009). AI/AN adolescents are also more likely to have consumed alcohol in their lifetime and have higher rates of binge drinking compared to Caucasian adolescents (Rees C, 2014, Spear S, 2005, Friese B, 2011, Friese B, 2008).

Previous research among adult AI/AN women has focused on collaborations with tribal communities to develop tailored, culturally sensitive AEP prevention interventions that decrease binge drinking and/or increase contraception use. In one such intervention, researchers modified the evidence-based CHOICES (Changing High-Risk Alcohol Use and Increasing Contraception Effectiveness Study) intervention for use with a Great Plains AI/AN reservation community (Project CHOICES Intervention Research Group, 2003, Hanson and Pourier, 2016, Floyd et al., 2007). This intervention is conducted via in-person motivational interviewing (MI) sessions and includes activities such as readiness rulers, decisional balance exercises, and goal setting (Project CHOICES Intervention Research Group, 2003). An efficacy study found that CHOICES significantly reduced AEP risk among adult AI/AN women (Hanson et al., 2017). Lacking in the recent published literature, however, is the inclusion of AI/AN teens in an AEP prevention program. A previous needs assessment with a Great Plains AI/AN tribal community highlights the necessity of including adolescents within (Jensen et al., 2016).

In addition to including AI/AN teens within AEP prevention efforts, there is a need to adjust in-person interventions to meet the needs of rural and remote communities. Challenges of implementing in-person interventions in remote, reservation communities are complex and

multifaceted. CHOICES and other in-person interventions require women to visit study sites in-person to participate with a trained interventionist, which is costly to implement. Transportation is often problematic in these areas as many must travel long distances to the nearest town for services and inclement weather often exacerbates this barrier (Noren et al., 1998). As in many rural communities, healthcare facilities are often understaffed and resources dedicated to prevention programming are lacking.

Therefore, online or ‘app’ versions of interventions are essential to reaching high-risk and hard-to-reach AI/AN women and teens, especially as society has become more digitally connected (National Telecommunications & Information Administration, 2013). Internet interventions may be particularly engaging for young adults and adolescents because they are one of the first generations that have grown up with readily available technology such as cell phones and the Internet. Computer-assisted self-interviews have been shown to work well for data collection with adolescents regarding tobacco, alcohol, and marijuana, with no significant difference in response rate from self-administered questionnaires (Webb et al., 1999). It is important to note that media technologies, such as the Internet, cell phones, and video games, have been previously effective with AI/AN youth (Bowen et al., 2012, Markham and Shegog, 2011, Leston et al., 2012).

Efforts have been made to modify CHOICES into an online format. For example, the Contraception and Alcohol Risk Reduction Internet Intervention (CARRII) has been pilot tested with a general population, showing an online version of CHOICES was “acceptable, feasible, and promising to reduce AEP risk” in a general population (Ingersoll et al., 2018). Nonetheless, there remains a need to conduct this same process with AI/AN women and teens. Therefore, the two purposes of this formative study were to: 1) gather input from local experts to determine any needed changes to the current CHOICES curriculum for AI/AN teens; and 2) gather additional data on the acceptability of CHOICES to teen AI/AN females, with a specific focus on CHOICES as an eHealth intervention for this group. The potential of adapting CHOICES for use with teens via an online, interactive intervention would make primary AEP prevention available to more AI/AN teens at risk, representing a new option for prevention with the potential for profound public health impact.

Methods

Development

Institutional review board approval was obtained at both the tribal level and at the principal investigator’s institution. As noted elsewhere, CHOICES with AI/AN already underwent substantial formative work to make it community-based and culturally relevant (Hanson and Pourier, 2016, Hauge et al., 2015). CHOICES with AI/AN included several MI-focused activities already embedded in the existing CHOICES intervention, including: 1) readiness rulers, which asks participants, on a scale from 1 to 10, how ready they were to change their drinking/birth control, how important it was to them, and how sure they were that they could change (Nieman et al., 2005); 2) decisional balance exercises which asks participants to list the good things and not so good things about their current drinking/use of birth control and also the good things/not so good things about changing current drinking/contraception behaviors; 3) temptation/confidence exercises related to alcohol consumption and birth

control utilization, based on the Brief Situational Confidence Questionnaire (Breslin et al., 2000) and the Self-Efficacy for Contraception Scale (Grimley et al., 1996); and 4) goal setting, where participants are asked various questions about their goals for drinking and birth control behavior.

To develop CHOICES for AI/AN Teens, called the CHAT Program, we first conducted key informant interviews with professionals in the community to discuss potential changes to the existing CHOICES intervention. In total, 15 in-depth interviews were conducted. Snowball sampling was employed to recruit interviewees who were primarily working with adolescents in the community. These were completed in collaboration with the project's local program coordinator, who is a tribal member with several years of experience in child and adolescent behavioral health. We solicited feedback on specific activities of the existing CHOICES curriculum and whether such activities would be of interest to teen girls in the community. The interviews were audio recorded and later transcribed. The transcriptions were used for qualitative analysis to find major themes on suggested changes and components of CHOICES to create the CHAT curriculum.

To develop a CHOICES intervention for AI/AN teens that utilized technology, we utilized REDCap (Research Electronic Data Capture) and built the activities within this free online data capture system. The CHAT curriculum was developed in the secure web application as an interactive and user-guided learning experience. Programmed branching logic allowed the user to choose the order in which they completed the topics within the intervention (i.e. alcohol or contraception). Quizzes were programmed to give users instant feedback on their answers. The REDCap API was utilized by securely pulling data into R through a Shiny app to generate easy to visualize responses to temptation and confidence questions pertaining to both alcohol and birth control (Chang et al., 2018, R Core Team, 2018).

Once the CHAT intervention was created and programmed within REDCap, we conducted focus groups with AI/AN teens in the community. AI/AN teens were recruited from across the community to participate. Recruitment was completed by advertising in local newspapers and radio, distributing flyers across the communities, and through community contacts and word-of-mouth. Focus groups occurred in private meeting rooms in various locations in the community. Written informed consent was obtained before data collection began and parental consent was obtained when appropriate. The interviews lasted approximately one hour and was facilitated by an individual from the research team and the local program coordinator. Each participant received a gift card of \$25 for compensation. In addition, snacks were served at each focus group as is custom in this tribal community.

Each focus group began by asking participants to reflect on the issues of fetal alcohol syndrome, substance use, and teen pregnancy in their community. To assess acceptability, focus group participants were asked about use of technology in general, such as Internet access within the reservation, preferred device types (e.g., laptop versus smart phones), and usability of the intervention, specifically by asking how they both feel about a web-based prevention program and how likely young community members are to complete such a web-based program. Focus group participants were then asked to reflect on the CHAT intervention by providing feedback on the language, look and feel, cultural referents, and

other features. Focus group participants reviewed each section of the curriculum as a group. To complete this, the drafted REDCap-based CHAT intervention was displayed on a projector or an iPad and the groups were asked about their opinion of the activities, graphics, readability/wording of questions, flow of the curriculum and design of the intervention.

Data analysis

Data analysis was conducted by two team members with qualitative data analysis training. The same data analysis procedure was employed to analyze data from the key-informant interviews and focus group discussions. The coders specifically sought themes that represented suggestions for changes to the existing CHOICES curriculum and the drafted CHAT curriculum made by the interviewees and focus group participants, respectively. The primary coder began by analyzing the transcripts for emergent themes. The primary coder used the repetition technique, which allowed the coder to identify a recurring pattern within the data (Ryan and Bernard, 2003). Afterwards, the secondary coder analyzed the data using the emergent themes, while also looking for new themes. In order to solidify the reliability of the findings of the study and to maintain rigor, both coders discussed the themes they discovered and any discrepancies were resolved with the help of the principal investigator. The research team met regularly to determine how to finalize the CHAT curriculum based on themes. Qualitative data were analyzed using textual analysis software Nvivo (version 11; QSR International Pty Ltd., Melbourne, Australia).

Results

Creation of CHAT

To develop CHAT, a total of 15 key informant interviews were conducted with both women (n = 11) and men (n = 4) who ranged in age from 27 – 78 and were American Indian (n = 14) or African American (n = 1). All were individuals working within the reservation community or with AI/AN in an off-reservation community approximately two hours away from the reservation. The interviewees worked as health care professionals in the community (n = 10), within schools (n = 3), or were elders with vast knowledge of culture (n = 2). Input from these key informant interviews and changes made to the intervention are located in Table 1.

Acceptability of CHAT

After modifications were made based on the key informant interviewee's input, three focus groups were held with n = 15 adolescent AI/AN females with ages ranging from 15–19 years old (mean = 17 years old). All lived in the community where CHOICES occurred with adult women and where CHAT was being proposed. The majority (n = 10) were current high school students; three had high school diplomas but were currently unemployed, and two had no high school diploma and were unemployed. As noted, participants were asked open-ended questions about FAS, contraception, and alcohol and were asked to reflect on the CHAT curriculum displayed via a projector or iPad.

Based on feedback from the focus groups, CHAT, as both an AEP prevention program for youth and specifically as one provided via electronic means, was acceptable to participants

and had great potential with AI/AN teens. In general, participants stressed that an AEP prevention program for youth is very necessary in this particular AI/AN community. As one young participant stated, “Native Americans are gonna go back to do what they’re gonna be doing. You know, but if you keep on trying, repeating it and repeating it, there is a possible chance that it could be prevented. But you just gotta give us a chance.” A preconception approach was vital because, as one focus group member stated, “... if you reduce your drinking, then when you have the baby, you’re just gonna drink again, you know,” indicating that including women before and after pregnancies was important to prevent AEP.

In addition, the AI/AN teen participants believed that an eHealth or Internet-based intervention was entirely possible in this community. According to participants, most teens and women in the community have regular access to the Internet. Participants stated, a local Internet service provider “gives out free WiFi for free sometimes” and, “I don’t think anybody in my community could live without-live without it [WiFi].” There are also community businesses that offer free wireless Internet access for individuals to use.

With regard to devices to access the Internet, participants said that the majority of community members have their own cellular device because a local cellular service organization “gave out free iPhones.” Both laptops and phones were feasible ways of providing an eHealth prevention program, with several focus group participants specifically stating they have laptops and iPads in addition to their cell phones. With all having access to some type of technology to access the Internet, participants said that calling and texting is a good way to reach them and that an eHealth intervention “would be good.”

In addition, participants gave input into the formatting, activities, and visual educational opportunities as “cool,” “helpful,” and “useful.” One participant in particular felt that it “would help people. Especially people that didn’t see a problem ‘cause it-it kind of helps like-or can tell there is a problem and that they can get help and stuff.”

After hearing about the CHOICES intervention, which is traditionally face-to-face, many participants felt that having CHOICES available by via the Internet might be more acceptable due to the sensitive nature of the topic. In particular, focus group participants felt that providing the birth control information via an online format was extremely valuable. For example, one focus group participant stated, “Like, if it was a link on Facebook about it, then I’m pretty sure everybody would go to it, but they won’t tell you that you went to it. Like, some people would probably be embarrassed to come to this. That’s what I’m saying. To be talking about their problems.” Another respondent agreed, stating, “Yeah, some people are probably embarrassed to talk (in-person) about that.” Overall, focus group participants liked how the birth control information was presented, with one stating, “That’s pretty, um, important for people to see to see what’s most effective and least effective.”

With regards to providing interactive birth control information, many participants felt that the information was new to AI/AN girls living in the community. One participant revealed that birth control information, “Makes me kind of scared...’cause I’m not sexually active, so I-I don’t deal with that sex.” Another focus group member stressed that “I think it [birth control] should get introduced to more girls, I mean some girls that have kids today, they

didn't plan on it." Participants felt that the information and activities on birth control were sensitive but necessary. As one participant concluded, "I mean, it might be personal, but... she has to be true about it."

Focus group members also were very accepting about the optional visit to a healthcare provider to discuss birth control in-person, a major component of both CHOICES and CHAT. They liked the idea of encouraging a birth control visit as "they may need this little intro to do it and stuff to, some people don't have that person to show them and stuff so yeah, it be good." A visit to a health care provider appeared to be a "safer" and more "trustworthy" option than relying on parents or family members to provide education. As one focus group participant stated, "Yeah, they're more-a lot of girls are more scared to talk to their parents about it," with another clarifying that, "the midwife will understand, 'cause, you know, knowing the midwife, how she heard, what, 10,000 stories about it. So, she's probably be more-like, she would probably be more-be more useful than your parents."

In addition to the interactive birth control education provided by CHAT, the alcohol activities also resonated with participants. According to the focus groups, many AI/AN adolescents did not have strong knowledge regarding standard drink sizes and several focus group participants felt that general information on alcohol types and drink sizes would be "new to them." CHAT included opportunities to quiz participants on the number of standard drink calculations for different drinks that are commonly drank among AI/AN youth in the community, but several participants either didn't know what a standard drink was, had "never thought about" standard drinks, or were admittedly guessing to the number of drinks (e.g., "so we gonna guess"). Participants seemed interested in the drink size quiz, with one stating "actually learned something about it [alcohol]" and another concluding that "I didn't know, like, how much could be in that." The focus group members felt that providing interactive alcohol education via the CHAT intervention would be beneficial as "at least then they'll know how much they're drinking and what's in them."

Finally, members of the focus groups responded positively to the online CHAT intervention. For the readiness rulers, some participants were initially confused by the similarities in the exercise questions (e.g., expect to change, want to change, and intend to change), but several also stated that the confusion was mainly around birth control utilization for people who were not currently sexually active. Focus group members endorsed the decisional balance exercise (e.g., good things and not so good things about behavior and changing behavior) as appropriate; as one focus group participant stated, "[this exercise] makes them think, like, what are the good things and what are the bad things about it, you know?"

Most of the input on the CHAT exercises centered on the temptation/confidence exercises, which gives certain situations that might increase risk for drinking or being less likely to use birth control. Participants seemed to personalize these situations, stating things like, "Because I don't really drink, but I know when I'm stressed or if I'm mad then I drink," and when asked about having sex without using birth control if under the influence of alcohol or drugs, responding by "...that's weird to think about" and "Um, not weird, but it's kind of scary for me, ew." In general, though, focus group participants felt the situations given in the

temptation/confidence exercises were appropriate for AI/AN teens, and one participant even added a situation for not using birth control: “Maybe a guy wants a kid, I don’t know.”

Discussion

The goal of the paper was to describe the process by which community input was gathered to develop an eHealth intervention to prevent AEP with AI/AN. A two-tiered, qualitative process was used, wherein the key informant interviews were conducted with stakeholders and individuals with experience working with AI/AN youth. The feedback from the key informant interviewees advised on changes to the existing CHOICES intervention, with the outcome being the creation of the CHAT intervention, an online version of CHOICES. Once developed using REDCap, focus groups with AI/AN teens were vital to gathering additional input on the acceptability of CHAT and an online intervention with AI/AN teens. Specifics on suggested changes to the CHOICES curriculum for AI/AN teens are reported in more detail in an earlier paper from this team and include options for making alcohol and birth control information and activities more appealing to teens (Shrestha et al., 2019).

With input from key informant interviewees to better tailor appropriate visuals, language, and graphics for AI/AN teen girls, our focus group data helped determine the great potential of a web-based intervention on AEP prevention for young AI/AN adolescents. Research on CHOICES and other AEP prevention efforts has recently begun utilizing technology for data collection (Delrahim-Howlett et al., 2011, Gorman et al., 2013, Montag et al., 2015, Farrell-Carnahan et al., 2013), but never with AI/AN teens, so the research findings presented here are timely. Results showed that eHealth interventions appear acceptable with rural, reservation AI/AN communities, particularly with youth and young people. The findings from this research back up what is known on eHealth interventions for AI/AN communities and for AI/AN youth specifically. REDCap specifically has been utilized with other tribal communities in health outcomes and intervention development research. In addition, media technologies, such as the Internet, cell phones, and video games, have been previously effective with AI/AN youth (Bowen et al., 2012, Markham and Shegog, 2011, Rushing and Stephens, 2011, Leston et al., 2012).

Limitations

Participants of this study were living in an AI/AN community in the Great Plains, which limits the generalizability of results. Therefore, other rural or tribal communities may need to apply a similar methodology if interested in developing a program like CHAT or CHOICES. The sample size was also a small convenience sample, although appropriate for a formative, qualitative study. The results from this study point to the need to continue work in AEP prevention with AI/AN youth, as well as additional feedback on the feasibility and acceptability of eHealth and web-based interventions with tribal communities. Additional research on the feasibility and effectiveness is necessary via the implementation of the actual CHAT program.

Conclusions

This study has implications for AEP prevention programs specifically catered to AI/AN teen girls. This paper provides formative, qualitative research on the adaptation of a preconceptional prevention of AEP for in AI/AN teens in a tribal community. Although previous community-driven research has modified CHOICES to be culturally valid, additional feedback was needed in the development of CHOICES for AI/AN teens. This is particularly true given the mindset of many prevention programs with AI/AN adolescents, which often compartmentalizes behavioral change. For example, many previous prevention efforts with AI/AN teens targeted either substance use (Allen et al., 2014, Dickerson et al., 2016, Donovan et al., 2015, Gilder et al., 2017, Komro et al., 2017, Kulis et al., 2017, Liddell and Burnette, 2017, Philip et al., 2016) *or* contraception/sexual activity (Garwick et al., 2008, Hohman-Billmeier et al., 2016, Kenyon et al., 2019, Schanen et al., 2017, Shegog et al., 2017, Tingey et al., 2017) separately, which is problematic as alcohol consumption can have an impact on the consistency of birth control utilization (Campo et al., 2010). Other researchers conclude that interventions addressing *both* substance use and sexual risk-taking behaviors, such as the CHOICES/CHAT interventions, are essential to reduce risk for AEP (Chambers et al., 2016, Markham et al., 2015).

Acknowledgements

Special thanks to Julie He Crow, who assisted with data collection.

Sources of Support: The authors disclosed receipt of the following financial support for the research, authorship, and publication of this article. Funding for this project comes from the National Institute of General Medical Sciences of the National Institutes of Health under grant number 5P20GM121341. The content is solely the responsibility of the authors and does not necessarily represent the official views of the NIH.

References

- ALLEN J, MOHATT GV, BEEHLER S & ROWE HL 2014 People awakening: collaborative research to develop cultural strategies for prevention in community intervention. *Am J Community Psychol*, 54, 100–11. [PubMed: 24903819]
- BOWEN DJ, HENDERSON PN, HARVILL J & BUCHWALD D 2012 Short-term effects of a smoking prevention website in American Indian youth. *J Med Internet Res*, 14, e81. [PubMed: 22659390]
- BRESLIN FS, SOBELL LC, SOBELL MB & AGRAWAL S 2000 A comparison of a brief and long version of the Situational Confidence Questionnaire. *Behavior Research and Therapy*, 38, 1211–1220.
- CAMPO S, ASKELSON NM, SPIES EL & LOSCH M 2010 Preventing unintended pregnancies and improving contraceptive use among young adult women in a rural, Midwestern state: health promotion implications. *Women Health*, 50, 279–96. [PubMed: 20512746]
- CHAMBERS R, TINGEY L, MULLANY B, PARKER S, LEE A & BARLOW A 2016 Exploring sexual risk taking among American Indian adolescents through protection motivation theory. *AIDS Care*, 28, 1089–96. [PubMed: 27064364]
- CHANG W, CHENG J, ALLAIRE JJ, XIE Y & MCPHERSON J 2018 shiny: Web Application Framework for R. R package version 1.2.0.
- DELRAHIM-HOWLETT K, CHAMBERS CD, CLAPP JD, XU R, DUKE K, MOYER RJ 3RD & VAN SICKLE D 2011 Web-based assessment and brief intervention for alcohol use in women of childbearing potential: a report of the primary findings. *Alcohol Clin Exp Res*, 35, 1331–8. [PubMed: 21410488]

- DICKERSON DL, BROWN RA, JOHNSON CL, SCHWEIGMAN K & D'AMICO EJ 2016 Integrating Motivational Interviewing and Traditional Practices to Address Alcohol and Drug Use Among Urban American Indian/Alaska Native Youth. *J Subst Abuse Treat*, 65, 26–35. [PubMed: 26306776]
- DONOVAN DM, THOMAS LR, SIGO RL, PRICE L, LONCZAK H, LAWRENCE N, AHVAKANA K, AUSTIN L, LAWRENCE A, PRICE J, PURSER A & BAGLEY L 2015 Healing of the canoe: preliminary results of a culturally tailored intervention to prevent substance abuse and promote tribal identity for Native youth in two Pacific Northwest tribes. *Am Indian Alsk Native Ment Health Res*, 22, 42–76. [PubMed: 25768390]
- FARRELL-CARNAHAN L, HETTEMA J, JACKSON J, KAMALANATHAN S, RITTERBAND LM & INGERSOLL KS 2013 Feasibility and promise of a remote-delivered preconception motivational interviewing intervention to reduce risk for alcohol-exposed pregnancy. *Telemed J E Health*, 19, 597–604. [PubMed: 23763608]
- FLOYD RL, DECOUFLE P & HUNGERFORD DW 1999 Alcohol use prior to pregnancy recognition. *Am J Prev Med*, 17, 101–7. [PubMed: 10490051]
- FLOYD RL, SOBELL M, VELASQUEZ MM, INGERSOLL KS, NETTLEMAN MD, SOBELL L, MULLEN PD, CEPERICH SD, VON STERNBERG K, BOLTON B, SKARPNESS B & NAGARAJA J 2007 Preventing alcohol-exposed pregnancies: a randomized controlled trial. *American Journal of Preventive Medicine*, 32, 1–10. [PubMed: 17218187]
- FRIESE B G. J 2008 Differences in drinking behavior and access to alcohol between Native American and white adolescents. *J Drug Educ*, 28, 273–284.
- FRIESE B, G. J., SENINGER S, PASCHALL MJ, MOORE RS 2011 Drinking behavior and sources of alcohol: differences between Native American and White youths. *J Stud Alcohol Drugs*, 72, 53–60. [PubMed: 21138711]
- GARWICK AW, RHODES KL, PETERSON-HICKEY M & HELLERSTEDT WL 2008 Native Teen Voices: adolescent pregnancy prevention recommendations. *J Adolesc Health*, 42, 81–8. [PubMed: 18155034]
- GILDER DA, GEISLER JR, LUNA JA, CALAC D, MONTI PM, SPILLANE NS, LEE JP, MOORE RS & EHLERS CL 2017 A pilot randomized trial of Motivational Interviewing compared to Psycho-Education for reducing and preventing underage drinking in American Indian adolescents. *J Subst Abuse Treat*, 82, 74–81. [PubMed: 29021119]
- GORMAN JR, CLAPP JD, CALAC D, KOLANDER C, NYQUIST C & CHAMBERS CD 2013 Creating a culturally appropriate web-based behavioral intervention for American Indian/Alaska Native women in Southern California: the healthy women healthy Native nation study. *Am Indian Alsk Native Ment Health Res*, 20, 1–15.
- GRIMLEY DM, PROCHASKA GE, PROCHASKA JO, VELICER WF, GALAVOTTI C, CABRAL RJ & LANSKY A 1996 Cross-validation of measures assessing decisional balance and self-efficacy for condom use. *American Journal of Health Behavior*, 20, 406.
- HAMILTON BE, HOYERT DL, MARTIN JA, STROBINO DM & GUYER B 2013 Annual summary of vital statistics: 2010–2011. *Pediatrics*, 131, 548–58. [PubMed: 23400611]
- HANSON JD, NELSON ME, JENSEN JL, WILLMAN A, JACOBS-KNIGHT J & INGERSOLL KS 2017 Impact of the CHOICES intervention in preventing alcohol-exposed pregnancies in American Indian women. *Alcoholism: Clinical and Experimental Research*, 41, 828–835.
- HANSON JD & POURIER S 2016 The Oglala Sioux Tribe CHOICES Program: Modifying an existing alcohol-exposed pregnancy intervention to use with an American Indian community. *International Journal of Environmental Research and Public Health*, 13, 1–10.
- HAUGE CH, JACOBS-KNIGHT J, JENSEN J, BURGESS KM, PUUMALA SE, WILTON G & HANSON JD 2015 Establishing survey validity and reliability for American Indians through “think aloud” and test-retest methods *Qualitative Health Research*, 25, 820–830. [PubMed: 25888693]
- HOHMAN-BILLMEIER K, NYE M & MARTIN S 2016 Conducting rigorous research with subgroups of at-risk youth: lessons learned from a teen pregnancy prevention project in Alaska. *Int J Circumpolar Health*, 75, 31776. [PubMed: 27938637]

- INGERSOLL K, FREDERICK C, MACDONNELL K, RITTERBAND L, LORD H, JONES B & TRUWIT L 2018 A Pilot RCT of an Internet Intervention to Reduce the Risk of Alcohol-Exposed Pregnancy. *Alcohol Clin Exp Res*, 42, 1132–1144. [PubMed: 29741798]
- JENSEN J, KENYON DB & HANSON JD 2016 Preventing alcohol-exposed pregnancy among American-Indian youth. *Sex Educ*, 16, 368–378. [PubMed: 27429593]
- KENYON DB, MCMAHON TR, SIMONSON A, GREEN-MAXIMO C, SCHWAB A, HUFF M & SIEVING RE 2019 My Journey: Development and Practice-Based Evidence of a Culturally Attuned Teen Pregnancy Prevention Program for Native Youth. *Int J Environ Res Public Health*, 16.
- KOMRO KA, LIVINGSTON MD, WAGENAAR AC, KOMINSKY TK, PETTIGREW DW & GARRETT BA 2017 Multilevel Prevention Trial of Alcohol Use Among American Indian and White High School Students in the Cherokee Nation. *Am J Public Health*, 107, 453–459. [PubMed: 28103073]
- KULIS SS, AYERS SL & HARTHUN ML 2017 Substance Use Prevention for Urban American Indian Youth: A Efficacy Trial of the Culturally Adapted Living in 2 Worlds Program. *J Prim Prev*, 38, 137–158. [PubMed: 27943031]
- LESTON JD, JESSEN CM & SIMONS BC 2012 Alaska Native and rural youth views of sexual health: a focus group project on sexually transmitted diseases, HIV/AIDS, and unplanned pregnancy. *Am Indian Alsk Native Ment Health Res*, 19, 1–14.
- LIDDELL J & BURNETTE CE 2017 Culturally-Informed Interventions for Substance Abuse Among Indigenous Youth in the United States: A Review. *J Evid Inf Soc Work*, 14, 329–359. [PubMed: 28628397]
- MARKHAM C & SHEGOG R 2011 It's your game American Indian/Alaska Native youth: innovative approaches to preventing teen pregnancy among underserved youth [Online]. The University of Texas Prevention Research Center: The University of Texas School of Public Health Available: <https://sph.uth.edu/tprc/2011/11/22/its-your-game-american-indianalaska-native-youth-innovative-approaches-to-preventing-teen-pregnancy-among-underserved-youth/> [Accessed March 6, 2015].
- MARKHAM CM, CRAIG RUSHING S, JESSEN C, LANE TL, GORMAN G, GASTON A, REVELS TK, TORRES J, WILLIAMSON J, BAUMLER ER, ADDY RC, PESKIN MF & SHEGOG R 2015 Factors Associated With Early Sexual Experience Among American Indian and Alaska Native Youth. *J Adolesc Health*, 57, 334–41. [PubMed: 26299560]
- MAY PA, CHAMBERS CD, KALBERG WO, ZELLNER J, FELDMAN H, BUCKLEY D, KOPALD D, HASKEN JM, XU R, HONERKAMP-SMITH G, TARAS H, MANNING MA, ROBINSON LK, ADAM MP, ABDUL-RAHMAN O, VAUX K, JEWETT T, ELLIOTT AJ, KABLE JA, AKSHOOMOFF N, FALK D, ARROYO JA, HERELD D, RILEY EP, CHARNNESS ME, COLES CD, WARREN KR, JONES KL & HOYME HE 2018 Prevalence of Fetal Alcohol Spectrum Disorders in 4 US Communities. *Jama*, 319, 474–482. [PubMed: 29411031]
- MAY PA, GOSSAGE JP, WHITE-COUNTRY M, GOODHART K, DECOTEAU S, TRUJILLO PM, KALBERG WO, VILJOEN DL & HOYME HE 2004 Alcohol consumption and other maternal risk factors for fetal alcohol syndrome among three distinct samples of women before, during, and after pregnancy: the risk is relative. *Am J Med Genet C Semin Med Genet*, 127c, 10–20. [PubMed: 15095467]
- MONTAG AC, BRODINE SK, ALCARAZ JE, CLAPP JD, ALLISON MA, CALAC DJ, HULL AD, GORMAN JR, JONES KL & CHAMBERS CD 2015 Preventing alcohol-exposed pregnancy among an American Indian/Alaska Native population: effect of a screening, brief intervention, and referral to treatment intervention. *Alcohol Clin Exp Res*, 39, 126–35. [PubMed: 25623412]
- MONTAG AC, ROMERO R, JENSEN T, GOODBLANKET A, ADMIRE A, WHITTEN C, CALAC D, AKSHOOMOFF N, SANCHEZ M, ZACARIAS M, ZELLNER JA, DEL CAMPO M, JONES KL & CHAMBERS CD 2019 The Prevalence of Fetal Alcohol Spectrum Disorders in An American Indian Community. *Int J Environ Res Public Health*, 16.
- NATIONAL TELECOMMUNICATIONS & INFORMATION ADMINISTRATION. 2013 Household broadband adoption climbs to 72.4 percent. ntia.doc.gov [Online].
- NIEMAN LZ, VELASQUEZ MM, GROFF JY, CHENG L & FOXHALL LE 2005 Implementation of a smoking cessation counseling module in a preceptorship program. *Fam Med*, 37, 105–11. [PubMed: 15690250]

- NOREN J, KINDIG D & SPRENGER A 1998 Challenges to Native American health care. *Public Health Rep*, 113, 22–33. [PubMed: 9885525]
- PHILIP J, FORD T, HENRY D, RASMUS S & ALLEN J 2016 Relationship of Social Network to Protective Factors in Suicide and Alcohol Use Disorder Intervention for Rural Yup'ik Alaska Native Youth. *Interv Psicosoc*, 25, 45–54. [PubMed: 27110094]
- PROJECT CHOICES INTERVENTION RESEARCH GROUP 2003 Reducing the risk of alcohol-exposed pregnancies: a study of a motivational intervention in community settings. *Pediatrics*, 111, 1131–1135. [PubMed: 12728125]
- R CORE TEAM 2018 R: A language and environment for statistical computing. Vienna, Austria: R Foundation for Statistical Computing.
- REES C, F. A., WINFREE LT JR. 2014 The Native American Adolescent: SOcial Network Structure and Perceptions of Alcohol Induced SOcial Problems. *J Youth Adolesc*, 43, 405–425. [PubMed: 24061859]
- RUSHING SC & STEPHENS D 2011 Use of media technologies by Native American teens and young adults in the Pacific Northwest: exploring their utility for designing culturally appropriate technology-based health interventions. *J Prim Prev*, 32, 135–45. [PubMed: 21805055]
- RYAN GW & BERNARD HR 2003 Techniques to Identify Themes. *Field Methods*, 15, 85–109.
- SCHANEN JG, SKENANDORE A, SCOW B & HAGEN J 2017 Assessing the Impact of a Healthy Relationships Curriculum on Native American Adolescents. *Soc Work*, 62, 251–258. [PubMed: 28460025]
- SHEGOG R, CRAIG RUSHING S, GORMAN G, JESSEN C, TORRES J, LANE TL, GASTON A, REVELS TK, WILLIAMSON J, PESKIN MF, D'CRUZ J, TORTOLERO S & MARKHAM CM 2017 NATIVE-It's Your Game: Adapting a Technology-Based Sexual Health Curriculum for American Indian and Alaska Native youth. *J Prim Prev*, 38, 27–48. [PubMed: 27520459]
- SHRESTHA U, HANSON J, WEBER T & INGERSOLL K 2019 Community Perceptions of Alcohol Exposed Pregnancy Prevention Program for American Indian and Alaska Native Teens. *Int J Environ Res Public Health*, 16.
- SPEAR S, L. D., MCCAFFREY D, ELLICKSON P. 2005 Prevalence of substance use among White and American Indian young adolescents in a Northern Plains State. *J Psychoactive Drugs*, 37, 1–6. [PubMed: 15916246]
- TAN CH, DENNY CH, CHEAL NE, SNIEZEK JE & KANNY D 2015 Alcohol use and binge drinking among women of childbearing age - United States, 2011–2013. *MMWR Morb Mortal Wkly Rep*, 64, 1042–6. [PubMed: 26401713]
- THE NATIONAL CAMPAIGN TO PREVENT TEEN PREGNANCY. 2009 American Indian/Alaska Native youth and teen pregnancy prevention [Online]. Washington, D.C. Available: http://www.thenationalcampaign.org/resources/pdf/SS/SS39_NativeAmericans.pdf [Accessed January 15, 2014].
- 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: study protocol for a randomized controlled trial. *Trials*, 18, 89. [PubMed: 28241775]
- WEBB PM, ZIMET GD, FORTENBERRY JD & BLYTHE MJ 1999 Comparability of a computer-assisted versus written method for collecting health behavior information from adolescent patients. *J Adolesc Health*, 24, 383–8. [PubMed: 10401965]

Table 1.

Creation of the CHAT Program

Key Informant Interview Input	Modifications Made
Too wordy	<ul style="list-style-type: none"> * Utilized bullet points instead of sentences. * Tailored curriculum to a 6th grade reading level
Make the program more interactive and visual	<ul style="list-style-type: none"> * Added videos and quizzes to make more interactive * Activities and intervention made more interactive using REDCap and specific skip patterns
Privacy & protection of confidential/sensitive information	<ul style="list-style-type: none"> * Utilized REDCap, a secure web application for building and managing online data capture * Removed the use of a daily diary to track health behaviors
Use drinks that are common in community/something the girls can relate to	<ul style="list-style-type: none"> * Worked with AI/AN staff to create tailored visuals on types of alcohol and drink sizes that were relevant to the community
Use contraceptives that are common and available at the local IHS	<ul style="list-style-type: none"> * Created visually appealing, easy-to-understand educational images portraying different types of contraceptives and their effectiveness at preventing pregnancy * Obtained input from Ob/GYN provider regarding best way to present contraceptive information