Community-Specific Risk and Protective Factors for Risky Alcohol Consumption in American Indian Women of Reproductive Potential: Informing Interventions

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Abstract

Objective: To explore the effect of community-specific risk and protective factors on risky alcohol consumption and vulnerability to having an alcohol-exposed pregnancy in women within a Southern California American Indian community. **Methods:** A sample of 343 American Indian women of childbearing age was enrolled in a study of risky drinking. All participants completed a questionnaire including alcohol consumption, other health behaviors, the T-ACE risky alcohol consumption screen and the PHQ-9 to measure depression and functionality. A subset of 80 women additionally answered focus group-derived questions about why they choose or do not choose to drink. **Results:** Risk and protective factors varied among sample subgroups. Broadly, factors affecting risk and protection included: depression, perception of other women's drinking, children/family, perception of risk to the unborn child, and feeling pressured to drink. Women's drinking was highly influenced by female friends and relatives. Women were most likely to drink with a girlfriend. Nearly 40% of all participants asked felt pressured to drink. Depression was associated with riskier alcohol consumption, less effective contraception, and testing positive for risky drinking using the T-ACE screen. Depressed women were more likely to binge drink because of stress, trauma, and "to escape my problems", and more likely to have been exposed to trauma including sexual assault. **Conclusions:** Interventions should incorporate community-specific factors. In the present sample, two separate strategies are indicated by the data: an information campaign to increase women's awareness of true social norms and the risks of prenatal alcohol-exposure; and screening for and treating depression.

Keywords

Alcohol, women, AIAN, prevention research, fetal alcohol spectrum disorders

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Introduction

Alcohol exposed pregnancies result in a range of persistent cognitive, behavioral and adaptive function deficits termed Fetal Alcohol Spectrum Disorders (FASD) (Jones & Smith, 1973; Riley et al., 2011; Secretary of Health and Human Services, 2000; Streissguth, 2007). Interventions to prevent risky alcohol consumption and FASD may be more effective when specifically targeted (Caldwell, 2005; Fisher et al., 2007; Griner & Smith, 2006; Kreuter et al., 2000; Montag et al., 2012; Skinner et al., 1999). For this reason, a good understanding of both risk and protective factors for risky alcohol consumption among women of reproductive potential is of high importance.

In the general population, the strongest known risk factor for an alcohol-exposed pregnancy (AEP) is drinking prior to pregnancy (Ethen et al., 2009; Palma et al., 2007). Other risk factors often cited but not always significantly associated include higher maternal age, gravidity and parity; being unmarried or unemployed; heavy alcohol consumption by spouse or partner; psychological stress; being less religious or spiritual; smoking; and illegal drug use (Bakhireva et al., 2011; Cannon et al., 2015; Flynn & Chermack, 2008; Green PP, 2016; McLeod, 1993; Naimi et al., 2003; Palma, et al., 2007; Tsai et al., 2009; Waterson et al., 1990). Depression has also been associated with problem alcohol consumption in women (Helzer & Pryzbeck, 1988; Kessler et al., 1997; KUO et al., 2006; Parker et al., 2010; Slade et al., 2013; Tsai, et al., 2009).

In addition, cultural norms influence the consumption of alcohol leading to varying vulnerabilities to an AEP (Balachova et al., 2012; Green PP, 2016; Nilsen et al., 2008; O'Keeffe et al., 2015; Roozen et al., 2016). Variations in these norms are of high relevance in the various distinct American Indian/Alaskan Native (AIAN) populations across the U.S. (Beals et al., 2003; May & Gossage, 2001; O'Connell et al., 2005; Spicer et al., 2003; Yuan et al., 2010). However, risk factors for an AEP have not been well characterized for these communities. Similar to the general population, depression in AIAN communities may play a role (Beals et al., 2005; Dillard et al., 2012; Duran et al., 2004; Gone & Trimble, 2012); and among several AIAN population samples, problem drinking and depression have been linked (Dillard, et al., 2012; Kunitz, 2006; Montag et al., 2015; O'Connell et al., 2006). As in other communities, healthcare provider advice may be largely ignored (O'Connor & Whaley, 2006a) and women may not understand the extent to which they are at risk (Kaskutas, 2000), nor appreciate the true amount of alcohol they consume (Branco & Kaskutas, 2001).

In addition to risk factors shared by the general population, there may be other risk and resiliency factors specific to AIAN communities (Allen et al., 2006; Hawkins et al., 2004; Whitbeck et al., 2004). Historical loss, trauma, and discrimination resonate throughout AIAN life today, and mistrust of research and externally imposed interventions may be important factors (Caldwell, 2005; Davis, 2002; Szlemko et al., 2006; Whitbeck, et al., 2004). Conversely, enculturation may be a source of resilience (Gray et al., 2010; Torres Stone et al., 2006; Whitbeck, et al., 2004), and family and community may exert protective influences for an AEP (LaFromboise et al., 2006).

In this manuscript we describe the risk and protective factors in a specific AIAN community for risky drinking and an AEP using data from a study of AIAN women of reproductive age. This community-based study can inform prevention strategies specifically targeted to the risk and protective factors for that community. Given the known variability in AIAN communities' characteristics, an intervention's potential to succeed may depend upon the degree to which it is grounded in community-specific factors.

Methods

Ethics

This study was approved by University of California at San Diego (UCSD), San Diego State University (SDSU), and Southern California Tribal Health Clinic (SCTHC) Institutional Review Boards. A Certificate of Confidentiality (CoC), obtained from the National Institutes of Health (NIH), further protected the confidentiality of participants' data. All participants provided informed consent through a process where the consent form was read aloud and all staff members completed human subjects' protections training.

Sample Source

American Indian Alaska Native (AIAN) women from 18 to 45 years of age, of childbearing potential, were recruited from one of three AIAN health clinics located in Southern California between April 2011 and April 2014.

Recruitment and Study Protocol

Potential participants were approached by project staff, local AIAN community members, in waiting areas of health clinics and screened for eligibility. Interested and eligible participants were brought to a private room where they were taken through the consenting procedure, assigned a unique identifier, and completed a self-administered paper and pencil survey. The majority of women who completed the paper-based survey then completed a web-based survey, while a randomly selected subset was instead asked to complete an additional paper-based survey. Participants had the opportunity to be referred for professional substance problem use treatment following completion of each survey. Participants were provided incentives in the form of a \$10 gift card and a choice of a project fan or t-shirt emblazoned with the project logo at baseline.

Data Collection

Data was collected by project staff members who were trusted local AIAN community members.

Entire sample

Paper and pencil questionnaire. The self-administered, paper-based questionnaire included questions regarding current relationship situation (an eight response option question reduced to “cohabitating” or not), employment, religiosity, gravidity, parity, birth control use and frequency of correct usage, current use of prescription and non-prescription medications, smoking, illegal drug use, awareness of FASD, and alcohol consumption including number of standard drinks consumed per week and per occasion, and number of binge episodes in the past two weeks (binge defined in this setting as consuming ≥ 3 standard drinks/occasion). They were asked to complete a T-ACE and a PHQ-9 questionnaire.

Sample subgroups

Web-based questionnaire. Participants selected for the web-based survey self-reported additional information by computer regarding alcohol consumption over the past two weeks, pregnancy status, family history of alcohol problems, the age they began drinking alcohol, and contraceptive use. Illustrations of various alcoholic beverage containers were used to prompt recall.

Paper and pencil questionnaire. These questions were the result of feedback from the community obtained through a focus group and interview process described in detail elsewhere (Montag et al., 2017). Topics included whether and, if yes, when women felt pressured to drink; why they drank when they binge drank and why they chose not to when they did not drink; who they drank with when they were binge drinking and questions about this person’s drinking; and whether they had experienced trauma or abuse. At each point of contact, participants were offered referrals for professional treatment.

Measures

The nine item Patient Health Questionnaire (PHQ-9) measured depression and functionality. In a variety of studies it has been found to have a sensitivity of 73% and specificity of 94% for major depression (Kroenke & Spitzer, 2002; Kroenke et al., 2001; Spitzer et al., 1999). In 2016, the PHQ-9 was adopted as a HEDIS (Healthcare Effectiveness Data and Information Set) measure of depression and incorporated into the majority of healthcare plans in the US. Despite extensive validation among other groups and use within AIAN communities, the PHQ-9 has not been specifically validated among AIAN women of childbearing age. However, using NHANES data, the PHQ-9 was found to be invariant across race/ethnicity and education level groups (Patel, 2017). Depression variables derived from this measure included “depression” (depressed or not depressed), and “functionality” (impaired or not impaired) and were calculated as follows: Depression: a participant scoring >5 was identified as “depressed”; Functionality: a participant scoring 2 or 3 was identified as having their “functionality impaired”.

T-ACE (Tolerance, Annoyed, Cut down, Eye-opener) is a validated screening instrument of four questions structured to identify risky drinking (Sokol et al., 1989) shown to be valid in an AIAN population (Gale et al., 1998). The T-ACE questions and scoring were as follows: How many drinks does it take to make you feel tipsy/high? ($\leq 2 = 0$ points, $> 2 = 2$ points); Have people annoyed you by criticizing your drinking? (No = 0 points, Yes = 1 point); Have you felt you ought to cut down on your drinking? (No = 0 points, Yes = 1 point); Have you ever had a drink first thing in the morning to steady your nerves or to get rid of a hangover? (No = 0 points, Yes = 1 point). A score of ≥ 2 was considered positive for risky drinking (“T-ACE positive” variable). Sensitivity of the instrument has been estimated at 80-90% and specificity at 40-70% (Chang, 2001; Chang et al., 1998; Chiodo et al., 2010; Russell et al., 1994; Russell et al., 1996).

Contraceptive effectiveness defined as by WHO (see <http://www.fphandbook.org/>). *Using Birth Control Correctly* was defined as responding that birth control was used correctly every time or most of the time, as opposed to some of the time or none of the time.

The “Vulnerability to Alcohol-Exposed Pregnancy” variable was defined in four categories: “not at risk”, “at risk”, “not at high risk”, and “at high risk”. Being “at risk” for an AEP was defined as 1) currently using alcohol and 2) using a less than highly effective contraceptive method. The NIAAA defines “risky drinking” for women as more than 3 drinks at one time or more than 7 drinks per week (NIAAA, 2011). For the purposes of this study, we defined “binge” or “risky” drinking as 3 or more standard drinks per occasion and/or 8 or more drinks per week as this level of consumption has been predictive of risk of adverse pregnancy outcomes in other studies (May et al., 2013; May et al., 2007; May et al., 2008; May et al., 2004; May & Phillip Gossage, 2011). Being “at high risk” for an AEP was defined as “at risk” coupled with either consuming ≥ 3 drinks per occasion or consuming ≥ 8 drinks per week. The categories of vulnerability to AEP were not mutually exclusive, i.e., all “at high risk” women were also included in the “at risk” category.

“Regret” was measured by asking “Imagine you drank alcohol while you were pregnant and your child was born with fetal alcohol syndrome. How much would you regret drinking during your pregnancy?”

Statistical Analyses

Comparison of continuous, dichotomous, or categorical variables in tables of demographics, alcohol consumption, birth control use, knowledge questions (Appendix C), and depression were conducted using t-tests (continuous), χ^2 (dichotomous), Fisher’s exact test (dichotomous with small cell sizes), ANOVA, or nonparametric analyses (for data not normally distributed and not log-transformed). Normality in continuous variables was investigated by looking at skewness and kurtosis. ANOVA was used to examine associations among population characteristics. Regression was used to test for predictors of depression / impaired functionality and for vulnerability to AEP. First, each predictor was

tested to determine whether there were significant independent associations with that factor and depression/ functionality/ vulnerability to AEP. Then multiple logistic regression analysis was used to examine all variables previously found to be significant. All two-way interactions among significant variables were tested. Statistical significance was defined as 2-sided, p-value of <0.05. Statistical analyses were carried out using SPSS (PASW 18, SPSS Inc., Chicago, IL).

Results

Total Sample

A total of 343 women were recruited into the study, 33 of whom were pregnant. All women were included in analysis and tables indicate number responding to each question. Half of participants reported not currently consuming alcohol. As shown in Table 1 (see Appendix A), those reporting that they currently consumed alcohol were more likely to be employed, to have had more pregnancies, to use effective birth control and use it correctly, to smoke tobacco and to take illegal drugs. Drinkers and non-drinkers did not differ in the proportion who wanted more children, who were religious, or who were cohabitating. Furthermore, they did not differ in proportion identified as depressed or functionally impaired, or in FASD awareness.

Participants who did drink tended to drink in a heavy episodic pattern (binge drinking). Of 113 women responding to T-ACE questions, 73.5% (a quarter of the total sample) were T-ACE positive, identified as a risky drinker. A quarter of participants used no form of contraception (including abstinence) and less than a quarter used highly effective birth control. Applying the definitions specified in the methods section, we found 42.3% of participants to be “at risk” of having an alcohol-exposed pregnancy and more than a third, 35.2%, “at high risk” of AEP.

The level of awareness of FASD (nearly $\frac{3}{4}$ of participants had heard of FAS or FASD) and familiarity with community members affected by prenatal alcohol exposure (more than a third of participants knew someone affected) did not differ across the study subgroups (Tables 1 and 2, see Appendix B).

The level of knowledge regarding the risks of alcohol to pregnancies was relatively high. Risky drinkers were slightly less likely to answer questions correctly (Table 3). The level of knowledge regarding the risks of alcohol to women and prevalence of local alcohol consumption was relatively low and not different across the study subgroups.

Table 3.

Knowledge Questions (percent answering correctly)

Type Questions	Comparator Group	n	Selected Subgroup	n	p-value
	Not current drinker		Current drinker		
Relating to Pregnancy	95.9	62	92.0	58	.040
Relating to Women's Health	34.4	61	31.0	58	.542
Total	84.6	62	80.9	58	.043
	Not risky drinker		Risky drinker		
Relating to Pregnancy	95.8	69	91.5	51	.025
Relating to Women's Health	36.0	68	28.4	51	.175
Total	84.8	69	80.0	51	.009
	Not depressed		Depressed		
Relating to Pregnancy	94.7	78	92.8	40	.339
Relating to Women's Health	33.3	78	30.8	39	.668
Total	83.5	78	81.3	40	.263

More than a third of our sample (115 women) was identified as depressed. The proportion of participants categorized as depressed did not differ among current drinkers and abstainers. Nearly 14% of these women reported that their functionality was impaired. Women identified as depressed were more likely to consume alcohol in a risky fashion and to perceive a higher social norm regarding how many drinks are consumed by women of childbearing age in their community than women not identified as depressed (Table 2). In addition, they were less likely to use birth control (trend) and less likely to use it effectively; more likely to take prescription and illegal drugs; and more likely to test positive for risky drinking using the T-ACE screen. In this study, depression was associated with risk factors for having an alcohol-exposed pregnancy.

Subset Sample

Among the 80 women in our subset sample, 39% reported feeling pressured to drink. The times women reported feeling most pressured to drink were "Girl's Night Out" (22.4% of total and 56.7% of those feeling pressured), "Holidays/occasions" (22.4%), and "when I'm at the casino" (7.9%).

When binge drinking, women were by far most likely to drink with a girlfriend, followed by partner/spouse, sister, and cousin (Table 4). This is true among the sample of all women responding to the question "On occasions when you drink 3 or more drinks in one sitting, who are you most often drinking with?" (n=69) and among the more limited sample of current drinkers responding (n=51). The

proportion choosing to binge drink with a girlfriend increased as the level of risk for an alcohol-exposed pregnancy increased. More risky drinkers and women at high risk for an AEP responded that they drank with a girlfriend than those not identified as risky drinkers or at high risk for AEP. While depressed participants reported binge drinking with a girlfriend more than with anyone else, they were statistically less likely to drink with a girlfriend than non-depressed participants ($p=.038$).

Table 4.

The Person Participants Reported Drinking with when Binge Drinking. (Percent among indicated sub-sample of 69 persons responding.)

Person drinking with	Total Sample N=69	Current drinkers n=51	Risky drinkers n=39	At high risk for AEP N=29	Depressed N=22
Partner/spouse	30.4	31.4	33.3	27.6	22.7
Mom	13	13.7	10.3	10.3	4.5
Dad	8.7	7.8	7.7	6.9	4.5
Sister	25.1	27.5	30.8	24.1	18.2
Brother	8.7	7.8	10.3	6.9	9.1
Myself; I drink alone	17.4	21.6	25.6	20.7	22.7
Grandparent	2.9	2	2.6	3.4	0
Cousin	24.6	27.5	25.6	37.9*	31.8
Uncle	4.3	2	2.6	3.4	4.5
Aunt	7.2	2	2.6	3.4	13.6
Friend (girlfriend)	58	66.7	71.8*	79.3*	40.9*
Coworker	11.6	11.8	15.4	13.8	4.5
Other	7.2	7.8	10.3	6.9	0

The most common reasons, in order, that non-drinkers cited for not drinking were children, health, and family. Other reasons included “don’t like alcohol”, “I’m a recovering alcoholic”, and “lost loved ones to alcohol related incidents”. Current drinkers, when choosing not to drink, reported doing so because of children, having to drive or having to work or go to school. Risky drinkers cited “no money” significantly more often than non-risky drinkers. Women at high risk for an AEP were significantly more likely to credit having to work or drive. Women identified as depressed were significantly more likely to say they choose not drink because they “don’t like alcohol”.

The top reasons cited for why participants binge drink were “to relax”, “to help me enjoy time with friends or partner”, “because of stress”, and “to get buzzed”. Subgroups differed slightly with risky drinkers significantly more likely to drink to relax ($p<0.001$) or escape their problems ($p=0.007$) than non-risky drinkers. Depressed women were more likely than non-depressed women to drink to escape

their problems ($p=0.010$), or because of stress ($p=0.004$) or trauma ($p=0.013$). They were more likely to have been exposed to sexual assault ($p=0.032$).

Depressed women were slightly less likely ($p=.024$) than non-depressed women to regret drinking during pregnancy when imagining that they had given birth to a child with FASD, and slightly less likely ($p=.008$) to worry about their baby being harmed if they were to consume alcohol while pregnant (data not shown).

Of the 80 women in the paper-and-pencil subgroup sample, 17 declined to answer the abuse/trauma questions. Among the participants responding, 44.4% had been exposed to physical abuse, 50.8% to emotional abuse, and 61.9% to verbal abuse. Thirty-seven percent (36.5%) had been exposed to trauma and 36.5% had witnessed a traumatic event. Of the entire responding sample, 27% had been exposed to sexual assault. This did not differ by current drinker status, which was true for all abuse/trauma questions, but women identified as depressed were significantly more likely to have experienced sexual assault.

Regression analysis reveals that approximately 40% of variation in the amount alcohol women consumed per week could be explained by their perception of risk to a potential pregnancy, their perception of the drinking patterns of other women, how much their drinking partner drinks, whether they smoke, and whether they feel pressured to drink or not.

Limitations

Data in this study were self-reported and may have been biased by social acceptability. In view of this possibility, we strove to ensure and convey confidentiality by a variety of means including a Certificate of Confidentiality from the NIH. Approval and support was obtained from the Tribal IRB. Preparation of materials (detailed elsewhere, Montag, et al., 2017), recruitment, and interactions with participants were carried out by trusted community members trained as research staff. Participants were self-selected volunteers and may not represent all women of child-bearing age within the community. However, recruitment occurred at locations throughout the community to allow equal access for all. Validity may have been threatened by our use of 2-week increments when assessing alcohol consumption. A longer period of time may have provided more precise data.

Discussion

High risk drinking is increasing among women in the US including AIAN women (Grant et al., 2017). To maximize the benefit of interventions to reduce risky drinking and prevent FASD, it may be prudent to target efforts to address specific risk and protective factors among differing subgroups.

In the present study, the relevance of specific risk and protective factors varied depending upon alcohol consumption and depression status. Some factors found to affect drinking in general population

samples did not do so in the present sample including age, employment, religiosity, and being married or cohabitating. Other factors identified elsewhere as important were also found to be important in our study such as depression, smoking, and trauma. The strength of our finding that women's drinking is influenced by female friends and family members is interesting. As Table 4 shows, the influence of female friends grows with increased risk of harmful alcohol consumption. We did not specify "cousin" as male or female but, consistent with our other findings, many women verbally reported drinking with female cousins.

How do women make choices regarding alcohol consumption? As in previous literature, healthcare provider advice was not cited as a reason to abstain in the present study and appears to be largely ignored (O'Connor & Whaley, 2006b). Decision making strategies of drinkers and non-drinkers may differ. Reasons cited by non-drinkers for not drinking tended to reflect a more well thought-out or long-term strategy than those cited by current drinkers.

Among study participants, 115 women (34.2%) were identified as depressed (36.7% non-drinkers, 31.4% current drinkers, NS). This rate is high; comparable studies using the same depression instrument found a national prevalence of 14% (Farr et al., 2010) and an Alaska Native sample prevalence of 20% (Dillard, et al., 2012). Depression is an independent risk factor for risky drinking and was found to be meaningful in this study. The good news is that there are effective treatments for moderate and severe depression, and that depressed women may be identified using brief, culturally acceptable, inexpensive screening. Present results are being used to inform community response.

Implications for Prevention

- Differences in risk and protective factors exist among communities and community subgroups necessitating modification and targeting of interventions to maximize impact
- Two strategies are recommended for the present community based on study results:
 - 1a) Community wide ("girl power") intervention campaign, geared to all women, seeking to shift cultural norms by empowering women to protect friends/female relatives. This would include broad information dissemination regarding the reality of lower community alcohol consumption and risks of drinking to women and pregnancies (FASD), as well as encouraging friend-networks focused on support. Self-assessment of drinking may be encouraged by the campaign and required at each clinic interaction;
 - 2a) Screening for depression to help identify women at increased risk for AEP; and 2b) treating depression to prevent alcohol-exposed pregnancies.

Conclusion

Risk and protective factors varied among community subgroups. In our sample, girlfriends and female relatives played an important role in influencing the level of risk associated with alcohol consumption. Their impact could be harmful or protective. Perception of community drinking norms was skewed in that participants at greater risk believed the amount of drinking by their peers to be greater. Protective factors, beyond the perception of a lower social norm of drinking, included knowledge of the risks of alcohol consumption, drinking with people who consume less alcohol, and certain decision-making strategies. Consistent with previous literature, children were the top factor inducing AIAN women to stop or reduce drinking (Bezdek et al., 2004).

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Appendix A

Table 1.
Characterization of Sample by Alcohol Consumption Status

Variable	Not Current Drinker	n	Current Drinker	n	P value
Age (years)	28.0 ± 0.62	161	28.9 ± 0.57	179	.282
Has had a child	67.7	161	64.0	178	.479
Pregnancies (number)	2.44 ± 0.20	154	1.86 ± 0.15	176	.018
Children (number)	1.63 ± 0.14	161	1.44 ± 0.11	178	.269
Wants more children	59.5	148	59.8	174	.955
Employed	35.0	160	50.3	173	.005
Religious	84.8	151	87.3	166	.507
Cohabiting	43.8	160	42.4	177	.799
Birth Control Effectiveness		145		161	<.001
High	9.0		17.4		
Medium High	22.1		35.4		
Medium Low	25.5		20.5		
Low	0		1.2		
No birth control	43.4		25.4		
Using Birth Control Correctly	72.2	133	83.9	155	.016
Smoker	26.3	160	38.2	178	.019
Taking illegal drugs	8.1	161	15.1	172	.046
Taking prescription drugs	41.3	160	35.2	175	.273
Depression medication	9.2	131	6.5	123	.432
Depressed	36.7	158	31.4	175	.310
Functionality impaired	7.5	134	5.2	154	.428
Heard of FASD/FAS	75.8	153	72.1	172	.446
Know someone affected by FASD/FAS	36.4	154	35.7	154	.906
Alcohol consumption variables					
Total Sample					
Age at first drink	15.4 ± 0.3	143	15.0 ± 0.3	178	.423
Perception of Other Women's Drinking					
Drinks per week	7.13 ± 0.81	139	9.03 ± 0.72	165	.080
Drinks per occasion	3.23 ± 0.31	140	4.43 ± 0.28	168	.004
Depressed Subset					
Age at first drink	15.6 ± 0.6	55	13.9 ± 0.4	55	.023
Perception of Other Women's Drinking					
Drinks per week	7.38 ± 1.26	49	13.4 ± 1.9	47	.008
Drinks per occasion	2.87 ± 0.34	50	4.98 ± 0.53	51	.001

Appendix B

Table 2.

Characterization of Sample by Depression Status

Variable	Not Depressed	n	Depressed	n	P value
Age (years)	28.2 ± 0.5	221	29.1 ± 0.8	115	.332
Has had a child	63.2	220	73.0	115	.070
Pregnancies (number)	2.08 ± 0.15	213	2.28 ± 0.21	114	.436
Children (number)	1.45 ± 0.10	220	1.74 ± 0.15	115	.111
Wants more children	58.6	210	62.2	111	.642
Employed	45.4	218	38.4	112	.223
Religious	87.3	205	84.4	109	.475
Cohabiting	46.6	219	36.8	114	.089
Birth Control Effectiveness		201		104	.038
High	14.9		11.5		
Medium High	29.4		28.8		
Medium Low	24.9		16.3		
Low	0		1.9		
No birth control	30.9		41.4		
Using Birth Control Correctly	83.2	196	67.8	90	.003
Smoker	29.4	221	37.7	114	.123
Taking illegal drugs	8.2	219	18.0	111	.015
Taking prescription drugs	31.4	220	53.6	112	<.001
Depression medication	4.8	165	14.9	87	.006
Functionality impaired	1.2	169	13.9	115	<.001
Heard of FASD/FAS	75.7	210	70.8	113	.337
Know someone affected by FASD/FAS	36.1	202	35.6	104	.923
Alcohol consumption variables					
Total Sample					
Drinks per week	2.88 ± 0.35	203	6.10 ± 1.18	108	.001
Drinks per occasion	2.31 ± 0.27	206	2.29 ± 0.37	110	.972
Binge episodes / 2 weeks	0.95 ± 0.12	202	2.04 ± 0.45	108	.004
Age at first drink	15.5 ± 0.3	204	14.7 ± 0.4	110	.069
Perception of Other Women's Drinking					
Drinks per week	7.04 ± 0.58	203	10.2 ± 1.1	98	.006
Drinks per occasion	3.78 ± 0.29	203	3.89 ± 0.33	103	.805
Current Drinkers					
Drinks per week	5.15 ± 0.53	114	12.4 ± 2.1	53	<.001
Drinks per occasion	4.06 ± 0.40	117	4.67 ± 0.60	54	.400
Binge episodes / 2 weeks	1.64 ± 0.19	117	4.15 ± 0.83	53	<.001
Age at first drink	15.6 ± 0.3	119	13.9 ± 0.4	55	.002
Perception of Other Women's Drinking					
Drinks per week	7.07 ± 0.61	115	13.4 ± 1.9	47	<.001
Drinks per occasion	4.07 ± 0.33	114	4.98 ± 0.53	51	.137

Appendix C.

Knowledge Questions

Knowledge Questions (Percent Answering Correctly)
<i>Questions Relating to Pregnancy</i>
When a woman drinks alcohol when she is pregnant, the alcohol enters the baby's bloodstream. (T)
Just having a FEW drinks (1-3) during pregnancy is safe for the baby. (F)
Babies of women who drink alcohol during pregnancy are at risk for developing physical, mental and behavioral problems. (T)
Drinking alcohol is OK during the last 3 months of pregnancy. (F)
If a woman is already pregnant but does not know it yet and she is drinking alcohol, she can have a child with an Alcohol Related Birth Defect. (T)
During pregnancy, it is OK to drink during the morning. (F)
If you are breastfeeding and you drink alcohol, the alcohol can be passed to the baby through the milk. (T)
It is OK to drink wine during pregnancy. (F)
If you are nauseous or feel sick to your stomach during pregnancy, you should drink a beer. (F)
<i>Questions Relating to Women's Health</i>
Women are at a greater risk for developing alcohol-related problems than men. (T)
Most women aged 18-44 who are members of Southwestern Tribes currently drink alcohol. (F)