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Beliefs about Fetal Alcohol Spectrum Disorder Among Men and Women at Alcohol Serving Establishments in South Africa

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Abstract

BACKGROUND—South Africa has one of the highest rates of fetal alcohol spectrum disorder (FASD) in the world; however, little is known about what men and women, who attend alcohol serving establishments, believe about alcohol use during pregnancy and how these beliefs may be related to alcohol use.

OBJECTIVES—To understand FASD beliefs and related behaviors among men and women attending alcohol-serving establishments.

METHODS—We surveyed 1,047 men (n=565) and women (n=482) -including pregnant women and men with pregnant partners- attending alcohol serving establishments in a township located in Cape Town, South Africa. **RESULTS:** Among both pregnant (n=53) and non-pregnant (n=429) women, 54% reported drinking alcohol at least 2–4 times per month, and 57% reported having at least 3–4 alcohol drinks during a typical drinking session. Pregnant women were less likely to believe that they should not drink alcohol and that alcohol can harm a fetus when compared to non-pregnant women. Similar findings were observed between men with pregnant partners compared to men without pregnant partners. Among women, beliefs about how much alcohol pregnant women can safely drink were associated with self-reported alcohol use.

CONCLUSIONS—Efforts to address FASD need to focus on understanding how men and women perceive alcohol use during pregnancy and situational factors that contribute to alcohol consumption among pregnant women attending alcohol serving establishments. Structural and individual-level interventions targeting women at alcohol serving establishments should be prioritized to mitigate alcohol use during pregnancy.

INTRODUCTION

South Africa is affected by rates of fetal alcohol spectrum disorder (FASD) that are among the highest in the world(1). The Western Cape of South Africa in particular has the highest

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rates of FASD ranging from 43.8–89.2 per 1,000 children whereas the United States and Canada have rates generally observed at 1 per 1,000 children(2–5). FASD is directly linked to a multitude of negative health outcomes including deficiencies in the growth and development of mental and physical capabilities, particularly damage to the central nervous system. The effects of FASD are life-long with only limited treatment available(6–8). Furthermore, FASD has had a devastating impact on the Western Cape economy and health care system(9).

Rates of alcohol use among South Africans are among the highest in the world. In particular, within many townships in the Western Cape of South Africa, heavy alcohol use occurs in informal drinking establishments or shebeens and taverns(10–17). Among alcohol users, South Africa has one of the highest per-capita rates of alcohol consumption in the world(18, 19). Likewise, patterns of detrimental alcohol use(20–22) tend to be more severe in South Africa, compared to other parts of the world(18).

Heavy drinking among men and women, including pregnant women, in South Africa can be traced back to a time during apartheid when workers, in particular persons of mixed race (Coloureds), were paid in the form of alcohol, also known as the ‘dop’ system. The ‘dop’ system itself has existed for hundreds of years in the Western Cape as an efficient way to both compensate farmers and dispose of wine considered unfit to drink(23). Many attribute this pattern of alcohol consumption as leading to the establishment of informal drinking venues, and ultimately the high levels of drinking currently observed in townships across the Western Cape(24–28).

Given the devastating health outcomes associated with FASD and the alarmingly high rates of FASD in South Africa, concerted efforts must be made to prevent these illnesses(8, 19, 29, 30). However, to date, limited data exists to inform our understanding of predictors of alcohol intake during pregnancy. This lack of information, in turn, has stymied efforts to intervene and provide prevention options(31). Specifically, it is unknown what men and women, including pregnant women, and men with pregnant partners, believe about the relationship between alcohol use during pregnancy and FASD(32). Although negative beliefs about alcohol use during pregnancy may be ubiquitous in developed countries, it is possible that basic information about maternal health care is not reaching poorer populations in developing countries.(33–35) Research on FASD has generally focused on understanding how alcohol affects fetal development rather than psycho-social factors that can contribute to a women’s likelihood of consuming alcohol while pregnant(36–39). Furthermore, paternal influence has been identified as a critical yet understudied factor in shaping maternal health; therefore, it is important to consider perspectives of both men and women(40–45).

The limited data we do have on psycho-social factors relating to alcohol use during pregnancy has generally focused on countries with a relatively low rate of FASD(46). We are unaware of any available data on FASD related beliefs among men and women living in townships in the Western Cape of South Africa who attend drinking establishments. With devastatingly high rates of FASD in South Africa, we must garner greater information about the alcohol use patterns of women of childbearing ages; in particular we must focus our

efforts towards women residing in townships within this country because townships tend to have an elevated concentration of cases of FASD.

For the current study we used cross sectional surveys to assess pregnancy status, alcohol intake, and beliefs about FASD among men and women attending drinking establishments in the Western Cape of South Africa. Prior research on drinking establishments, in particular bars and shebeens, has highlighted these venues as important focal points in understanding risk behavior associated with alcohol use.(47) First, we set out to gain an understanding of the prevalence of pregnant women at drinking establishments. Next, given the documented high rates of FASD in the Western Cape, we predicted that alcohol use among pregnant women would be comparable to their non-pregnant counterparts. Similarly, we believed that high rates of alcohol use and problematic drinking would be commonly reported. Furthermore, given the lack of information on FASD related beliefs among both men and women, findings regarding this specific construct were considered exploratory in nature. However, we did hypothesize that elevated alcohol consumption and frequency would be related to FASD beliefs among women.

METHODS

Participants and Setting

Participants were men and women attending alcohol serving venues in a peri-urban township in Cape Town, South Africa. The township is located within 20 kilometers of Cape Town's central business district and consists of both people of historically mixed race (i.e., Coloureds) and Black Africans. A relatively new township, the community was established in 1990 and is one of the first townships in South Africa to racially integrate. Large numbers of indigenous Black Africans started settling in and around the township during the 1990's after government policies of racial segregation during Apartheid ended.

Venue selection

Using an adaptation of the Priorities for Local AIDS Control Efforts (PLACE) community mapping methodology(48), we located and defined alcohol serving establishments in the township for the current study. Alcohol serving venues were systematically identified by approaching a total of 210 members of the community at public places such as bus stands and markets, and asking them to identify places where people go to drink alcohol. Venues were eligible if they had space for patrons to sit and drink, reported >50 unique patrons per week, had >10% female patrons, and were willing to have the research team visit over the course of a year. Because venues attracted customers who were primarily either Black African (Xhosa speaking) or Coloured (Afrikaans speaking), three of each type were selected. Given that ethnicity varied by venue, this variable was controlled for when analyzing data.

Study procedures

Anonymous surveys were collected between October 2009 and February 2010 from patrons attending the six alcohol-serving venues. Individuals inside the venue were approached by field workers to complete the 9-page survey questionnaire, which took on average 10–15

minutes to complete(49). Care was taken to approach people as soon as they entered the venue in order to complete the assessment process before they became intoxicated. The field workers consisted of six staff members matched based on ethnicity to the majority of patrons in a given venue. Black African field workers spoke Xhosa and English, and Coloured field workers spoke Afrikaans and English. Surveys were administered in participants' preferred language. Field workers obtained verbal consent and allowed participants to complete the survey on their own, offering assistance with reading and understanding survey items when needed. Only 7% of participants required field staff assistance to complete the survey. Participants were given a small token of appreciation for completing surveys, such as a keychain or coffee mug. A total of 1,126 individuals were approached to participate, and 1,047 (93%) agreed. Surveys were scanned into a database using Remark Office OMR Version 6 (Gravic, Inc., Malvern, PA) and manual checks were done to identify errors. All study procedures were approved by the ethical review boards of Stellenbosch University, the University of Connecticut, and Duke University.

Measures

Measures were adapted from previous research conducted in South Africa and were administered in the three languages spoken throughout the township; English, Xhosa and Afrikaans. All of the measures were translated and back-translated to produce parallel forms.

Demographics and pregnancy status—Participants were asked to report gender, age, education, marriage, employment, ethnicity, whether their house has electricity or running water, whether they have children, HIV status, if they or their partner was currently pregnant, how far into the pregnancy are they or their partner (1–3, 4–6 or 7–9 months), and whether the pregnancy was planned.

Alcohol Use—Alcohol use was assessed using various measures each capturing unique components of alcohol intake(50). Alcohol frequency: Participants were asked to report how often they have a drink containing alcohol; responses ranged from '*never*' to '*more than 4 times a week*'. Alcohol consumption: Participants reported how many drinks containing alcohol they have on a typical day when they are drinking; responses ranged from '*I don't drink*' to '*10 or more*'. Heavy episodic drinking: Participants reported how often they have six or more drinks in a single occasion; responses ranged from '*never*' to '*daily or almost daily*'. We used six or more drinks to define binge drinking as this cut-off is based on a widely used scale (Saunders, 1993) and, therefore, allows for comparisons across multiple contextual and cultural settings.(50) Current drinking: Participants were asked if they planned on drinking at the bar that evening; responses were a dichotomous yes/no.

Broad-based and consumption-related FASD beliefs—Participants were asked four questions about their broad beliefs about FASD (see Table 4). Items included, in part: "Drinking alcohol while pregnant can harm the baby" and "Drinking alcohol while pregnant can lead to life-long health problems for the baby." Participants were asked whether they agreed or disagreed with items. Next, participants were asked two consumption-related FASD beliefs: "How many drinks containing alcohol can a pregnant woman have a day

without harming the baby?” Responses ranged from ‘*none*’ to ‘*9 or more*’. Finally, participants were asked “How often can a pregnant women drink alcohol without harming the baby?” Responses ranged from ‘*never*’ to ‘*daily or almost daily*’.

Data analyses

Data were analyzed separately for men and women, and we analyzed data for similarities and differences by pregnancy status (for women, pregnant or not; for men, partner pregnant or not). However, given the focus of assessing alcohol use among women when investigating FASD, we only report women’s data for our alcohol use section and our multivariate analyses section that includes alcohol use. We conducted descriptive analyses of sample demographic characteristics, alcohol use, and beliefs about FASD. Chi-square analyses for categorical variables and t-tests for continuous variables were conducted. In order to assess the relationships between FASD related beliefs and alcohol use we used generalized linear modeling. This modeling controlled for pregnancy and significant demographic differences between pregnant and non-pregnant women. There was less than 5% missing data for any given variable. For all analyses, we used $p < .05$ to define statistical significance. PASW Statistics version 18.0 (SPSS Inc., Chicago, IL) was used for all analyses.

RESULTS

Demographics

Eleven percent of women were pregnant and 20% of men had pregnant partners. Participants in the study reported similar ages, levels of education, and marital status regardless of pregnancy status (see Table 1). Pregnant women were more likely to be employed and report Black African ethnicity than non-pregnant women. Pregnant women were less likely to report that their house had indoor plumbing but equally likely to report that their house had electricity compared to non-pregnant women. No differences were observed among pregnant women in regards to their reporting on whether they had children. For men, no differences by partner’s pregnancy status were evident for ethnicity, housing status or having children. Responses to how far along the pregnancy was varied and many participants reported being unsure of gestational length. Around half of both men and women reported that the pregnancy was planned. Around 8% of women and 6% of men reported being HIV positive.

Alcohol use

High rates of alcohol use were reported by women regardless of pregnancy status. Alcohol use patterns were similar for both pregnant and non-pregnant women (see Table 2). Among pregnant women, 53.8% reported consuming alcohol at least 2–4 times a month; 56.8% report having at least 3–4 alcohol drinks during a typical drinking session; and 59.6% report heavy episodic drinking (having 6 or more drinks in one occasion) at least on a monthly basis. A majority of both pregnant and non-pregnant women reported attending the shebeen that evening to consume alcohol.

Broad-based and consumption-related FASD beliefs

Forty percent of pregnant women and 29% of non-pregnant women disagreed with the item stating that pregnant women should not drink alcohol (see Table 3). Thirty-seven percent of pregnant women and 21% of non-pregnant women disagreed that drinking alcohol while pregnant can harm the baby (pregnant women were significantly more likely to disagree with this item than non-pregnant women). Among men, those who had pregnant partners were more likely to disagree that alcohol use during pregnancy was problematic; men with pregnant partners were generally twice as likely to disagree with these items compared to men without pregnant partners. In terms of how often and how much a pregnant woman can drink alcohol without harming the fetus, responses varied by pregnancy status and results were similar for men and women. Around half of pregnant women and men with pregnant partners reported that a pregnant woman can consume alcohol during pregnancy without harming the fetus (significantly more so than non-pregnant women or men with pregnant partners). Thirty-one percent of pregnant women believed that they could have 3 or more drinks per day without causing harm vs. 8.1% of non-pregnant women. In contrast, around a quarter of non-pregnant women and men without pregnant partners reported that a woman can safely consume alcohol during pregnancy. Similar patterns were observed for how often a pregnant woman can consume alcohol. Pregnant women and men with pregnant partners were more likely to report that women could drink at various frequencies that would not harm the baby. Thirty-five percent of pregnant women believed they could drink at least monthly vs. 9.2% of non-pregnant women.

Multivariate analyses of FASD related beliefs and alcohol use

We used broad-based and consumption-related FASD beliefs as the independent variables in a series of multi-variate models with alcohol frequency and alcohol consumption as the dependent variables (See Table 4). These models controlled for pregnancy status and significant demographic characteristics, and were conducted among women only. For alcohol frequency we found that the more likely women were to disagree with believing that alcohol use is a problem within their community the greater frequency they reported alcohol use. Furthermore, the number of drinks women thought that pregnant women could safely consume predicted the frequency at which women drank. For alcohol consumption, we found no relationship between broad-based FASD beliefs and alcohol use consumption. However, we did find relationships between consumption-related FASD beliefs and alcohol use. How much and how often women believed that pregnant women could safely consume alcohol were predictors of their own alcohol consumption.

DISCUSSION

This study is the first to assess beliefs about FASD among men and women attending alcohol serving venues in a country with the highest rate of FASD in the world. Consistent with high rates of FASD, a substantial portion of our sample did not believe that alcohol use during pregnancy was harmful. Furthermore, data from the current study confirm the pregnant women attending drinking establishments consume high rates of alcohol. A majority of pregnant women report that they regularly consume moderate to heavy amounts of alcohol. Patterns of alcohol use were similar for non-pregnant women. Patterns of alcohol

use among non-pregnant women are alarming as there is evidence through our formative research that these women have very limited access to pregnancy tests and are likely to learn of their pregnancy after the first trimester. Therefore, consumption of alcohol prior to learning of pregnancy is of critical concern among the current population. Data indicate the urgent and ongoing need to intervene with pregnant women who continue to attend alcohol serving establishments.

A considerable proportion of both men and women believed that alcohol consumption among pregnant women was not harmful to the fetus. Overall, these rates were higher among pregnant women and men with pregnant partners. Based on the findings, it is evident that many of the men and women surveyed do not have an accurate understanding of how alcohol affects the fetus. Consumption-related FASD beliefs suggest that these items are an important predictor of alcohol use during pregnancy as these items were generally associated with alcohol use. However, it is possible that participants used their own experiences with alcohol as a point of reference to report on how much alcohol pregnant women can safely consume.

With this information, we surmise that interventions to mitigate alcohol use among pregnant women must focus on understanding misbeliefs regarding alcohol use during pregnancy. Furthermore, the social context surrounding alcohol consumption among these women is likely critical for intervention.⁽⁵¹⁾ With high rates of alcohol consumption and frequency being reported, pregnant women would likely need to considerably change daily routines and social connections in order to reduce alcohol use. Likewise, although partners within couples were not linked in the study, we do know that substantial numbers of men believed alcohol use is safe during pregnancy. This finding underscores the need to address the immediate social environment that influences of alcohol use. Given our recruitment at drinking establishments, we must also consider the role of these venues in intervention delivery. These establishments clearly offer opportunities to interact with pregnant women who are in need of maternal health services. Although challenges exist to intervening in alcohol establishments, interventions have been delivered in these settings and at the least could serve as an important venue for initial contact with women in need of services.^(52–54) Overall, these data suggest the pressing need to disseminate accurate information on the harmful effects of alcohol use during pregnancy and to address the misbeliefs many people harbor on the relationship between alcohol intake and FASD.

Findings from the current study should be viewed in light of their limitations. Results are limited to men and women attending shebeens and can't be generalized to the larger population. Likewise, data describing pregnant women are limited to women who are attending alcohol serving establishments and are likely not representative of women in the townships at-large. Findings related to FASD beliefs and alcohol use are likely to vary between people who do and do not attend shebeens. Data were cross sectional, which prevents reporting on causal findings. We also relied on self-report of potentially stigmatizing behaviors, which could potentially bias responses. Participants with partners were not linked in the study, which precludes us from the ability to draw dyadic level conclusions with the current data.

Our definition of heavy episodic drinking included having six or more drinks, however, NIAAA (2004)(55) has defined heavy episodic drinking as having 5 or more drinks consumed by a man and 4 or more drinks consumed by a woman. Due to this discrepancy in how we measured heavy episodic drinking it is likely that there are men and women in our sample who were not considered to have engaged in heavy episodic drinking when, based on NIAAA definition, they would have been included. Also, how we defined heavy episodic drinking does not take into consideration gender-specific differences in regards to this measure. Prior research has found that using gender-specific cut-offs for binge drinking improves accuracy in alcohol use assessments for women.(56) As such, future research in these areas should take into consideration these important caveats to assessing this form of drinking.

There exists an urgent need to better and more fully address alcohol use behaviors among pregnant women residing in South African townships. The high rates of FASD demand considerable action to raise awareness about the negative effects of alcohol use during pregnancy. Focusing on the environment wherein alcohol use occurs will likely be a critical objective in curbing alcohol use among pregnant women. A combination of structural-level interventions to highlight the harms associated with alcohol use during pregnancy and individual-level counseling interventions should be prioritized. Interventions aimed at reducing alcohol use among pregnant women should also focus on the broader context of these women's lives that may be contributing to high levels of alcohol intake. Without concentrated efforts to address alcohol use during pregnancy, rates of FASD in South Africa will continue to be among the highest in the world.

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Table 1
Demographic characteristics of men and women separated by pregnancy status (N=1047).

	Women					Men				
	Pregnant (n=53)		Not Pregnant (n=429)			Group Differences		Partner Pregnant (n=114)		
	M	SD	M	SD	t			M	SD	t
<i>Age</i>	30.40	11.63	32.15	11.42	1.04			30.60	8.96	3.14
<i>Education</i>	2.35	.65	2.21	.83	1.17			2.72	.91	.91
	n	%	n	%	X ²			n	%	X ²
<i>Married</i>	13	24.5	104	24.2	.02			112	24.8	.11
<i>Employed</i>	20	39.2	107	25.2	4.59*			267	59.7	.71
<i>Ethnicity</i>					8.89*					
Black	30	56.6	172	40.1				301	67.2	3.93
Coloured	20	37.7	248	57.8				138	30.8	
Other	3	5.7	9	2.1				9	2.0	
<i>House has electricity?</i>	49	94.2	392	91.6	.43			407	91.3	.07
<i>House has indoor water?</i>	37	71.2	373	86.9	9.19**			366	81.5	.39
<i>Do you have any children?</i>	43	84.3	325	75.8	1.87			306	68.9	6.43
<i>HIV status</i>										
Positive	6	11.3	26	6.1	2.11			24	5.3	1.10
Negative/Unknown	47	88.7	403	93.9				427	94.7	
<i>How far along into the pregnancy are you or your partner?</i>										
1–3 months	18	34.0	n/a					n/a		
4–6 months	12	22.6								
7–9 months	14	26.4								
Don't know	9	16.9								
<i>Was the pregnancy intended?</i>										
Yes	28	52.8	n/a					55	48.2	n/a
No	8	15.1						22	19.3	

	Women				Men			
	Pregnant (n=53)		Not Pregnant (n=429)		Partner Pregnant (n=114)		Partner Not Pregnant (n=451)	
	M	SD	M	SD	M	SD	M	SD
<i>Don't know</i>	17	32.0			35	30.7		

Notes:
* $p<.05$,
** $p<.01$,
*** $p<.001$; Group differences column includes *t-test* for continuous variables and χ^2 for categorical variables.

Table 2

Alcohol use among women separated by pregnancy status (N=482).

	Female Sample				Group Differences χ^2
	Pregnant (n=53)		Not Pregnant (n=429)		
	n	%	n	%	
Alcohol Frequency					
How often do you have a drink containing alcohol?					.59
Never	9	17.3	73	17.1	
Monthly or less	15	28.8	105	24.6	
2-4 times a month	13	25.0	112	26.3	
2-3 times a week	10	19.2	96	22.5	
More than 4 times a week	5	9.6	40	9.4	
Alcohol Consumption					
How many drinks containing alcohol do you have on a typical day when you are drinking?					3.69
I don't drink	7	13.7	67	15.6	
1-2	15	29.4	117	27.3	
3-4	7	13.7	92	21.4	
5-6	13	25.5	71	16.6	
7-9	4	7.8	33	7.7	
10 or more	5	9.8	49	11.4	
Heavy Episodic Drinking					
How often do you have 6 or more drinks on one occasion?					3.11
Never	11	21.2	79	18.5	
Less than monthly	10	19.2	103	24.1	
Monthly	13	25.0	95	22.2	
Weekly	13	25.0	129	30.2	
Daily or almost daily	5	9.6	21	4.9	
Current Drinking					
Came to bar to drink tonight?					2.66
Yes	38	73.1	262	61.5	

Notes:

*
 $p < .05$,
 **
 $p < .01$,

 $p < .001$; Group differences column includes t -test for continuous variables and χ^2 for categorical variables.

Table 3
Beliefs regarding alcohol use while pregnant among men and women separated by pregnancy status (N=1047).

	Women				Men			
	Pregnant (n=53)		Not Pregnant (n=429)		Pregnant (n=53)		Not Pregnant (n=429)	
	n	%	n	%	n	%	n	%
Pregnant women should not drink alcohol.								
<i>disagree</i>	21	40.4	123	28.9	59	51.8	145	32.3
<i>agree</i>	31	59.6	302	71.1	55	48.2	304	67.7
Drinking alcohol while pregnant can harm the baby.								
<i>disagree</i>	19	36.5	89	20.9	53	47.7	115	25.7
<i>agree</i>	33	63.5	337	79.1	58	52.3	333	74.3
Drinking alcohol while pregnant can lead to life-long health problems for the baby.								
<i>disagree</i>	16	31.4	96	22.5	63	55.8	121	27.0
<i>agree</i>	35	68.6	330	77.5	50	44.2	327	73.0
Drinking alcohol among pregnant women is a problem in my community								
<i>disagree</i>	17	34.0	123	28.8	50	43.9	125	27.8
<i>agree</i>	33	66.0	304	71.2	64	56.1	324	72.2
How many drinks containing alcohol can a pregnant woman have a day without harming the baby?								
None	26	51.0	327	76.8	54	48.2	341	75.9
1-2	9	17.6	65	15.3	23	20.5	55	12.2
3-4	6	11.8	11	2.6	9	8.0	14	3.1
5-6	5	9.8	5	1.2	9	8.0	4	.9
7-8	3	5.9	2	.5	5	4.5	6	1.3
9 or more	2	3.9	16	3.8	12	10.7	29	6.5
How often can a pregnant woman drink alcohol without harming the baby?								
Never	29	55.8	344	80.8	65	57.0	351	78.2
Less than monthly	5	9.6	43	10.1	12	10.5	31	6.9
Monthly	11	21.2	5	1.2	19	16.7	14	3.1
Weekly	3	5.8	17	4.0	13	11.4	21	4.7

	Women				Men			
	Pregnant (n=53)		Not Pregnant (n=429)		Pregnant (n=53)		Not Pregnant (n=429)	
	n	%	n	%	n	%	n	%
Daily or almost daily	4	7.7	17	4.0	5	4.4	32	7.1
				χ^2				χ^2

Notes:

* $p<.05$,

** $p<.01$,

*** $p<.001$; Group differences column includes t -test for continuous variables and χ^2 for categorical variables.

Table 4

Relationships between broad-based and consumption-related FASD beliefs, and alcohol frequency and consumption among women (N=482).

	Total Female Sample	
	Alcohol Frequency RR 95%CI	Alcohol Consumption RR 95%CI
Pregnant women should not drink alcohol.	.93 (.84–1.03)	1.04 (.92–1.17)
Drinking alcohol while pregnant can harm the baby.	1.03 (.91–1.31)	1.10 (.96–1.27)
Drinking alcohol while pregnant can lead to life-long health problems for the baby.	1.04 (.93–1.16)	1.12 (.97–1.28)
Drinking alcohol among pregnant women is a problem in my community	.89 (.80–.99)*	1.01 (.88–1.16)
How many drinks containing alcohol can a pregnant woman have a day without harming the baby?	1.16 (1.05–1.23)**	1.19 (1.06–1.35)**
How often can a pregnant women drink alcohol without harming the baby?	1.10 (.99–1.22)	1.23 (1.08–1.41)***

Notes:

* $p<.05$,

** $p<.01$,

*** $p<.001$

Analyses controlled for pregnancy status, ethnicity, and employment