

การตั้มแอลกอฮอล์ก่อนตั้งครรภ์

การรับรู้ความเสี่ยง การรับรู้ความรุนแรง

และการรับรู้สมรรถนะในการปฏิเสธการตั้ม

และการตั้มแอลกอฮอล์ขณะตั้งครรภ์ ในหญิงตั้งครรภ์ชาวภูฏาน

Pre-pregnancy alcohol consumption, perceived susceptibility, perceived severity, perceived drinking refusal self-efficacy and alcohol consumption during pregnancy among Bhutanese pregnant women

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บทคัดย่อ

การตั้มแอลกอฮอล์ขณะตั้งครรภ์เป็นปัญหาสุขภาพที่สำคัญระดับโลกและระดับประเทศ แม้ว่ามีการให้ข้อมูลแก่ผู้หญิงเกี่ยวกับการตั้มแอลกอฮอล์ตลอดระยะเวลาตั้งครรภ์ ยังพบมีอัตราการตั้มที่สูงและความเชื่อเป็นปัจจัยสำคัญของการตั้มแอลกอฮอล์ขณะตั้งครรภ์ การวิจัยครั้งนี้เพื่อศึกษาการตั้มแอลกอฮอล์และปัจจัยที่มีผลต่อการตั้มแอลกอฮอล์ของหญิงตั้งครรภ์ชาวภูฏาน ใช้ทฤษฎีความเชื่อเกี่ยวกับสุขภาพเป็นกรอบแนวคิดในการวิจัย กลุ่มตัวอย่างเป็นหญิงตั้งครรภ์ 100 คน ที่มีคลินิกรับฝากครรภ์โรงพยาบาลรัฐแห่งหนึ่ง ของประเทศภูฏาน เลือกกลุ่มตัวอย่างโดยการสุ่มแบบมีระบบ เก็บข้อมูลโดยการสัมภาษณ์ด้วยแบบสอบถามเชิงโครงสร้าง ผลการวิจัยพบว่า อัตราการตั้มแอลกอฮอล์ขณะตั้งครรภ์ค่อนข้างสูง (ร้อยละ 43.6) และผลการวิเคราะห์ถดถอยพหุคุณพบว่า การตั้มแอลกอฮอล์ในระยะก่อนตั้งครรภ์ การรับรู้ความเสี่ยง การรับรู้ความรุนแรง และการรับรู้สมรรถนะในการปฏิเสธการตั้ม เป็นปัจจัยร่วมที่มีผลต่อการตั้มแอลกอฮอล์ในขณะตั้งครรภ์ ถึงร้อยละ 67 ($F_{4,105} = 52.05, p < .001$) โดยการรับรู้ความเสี่ยงในการตั้ม ($\beta = -.20, p < .01$) การรับรู้ความรุนแรงของการตั้ม ($\beta = -.24, p < .001$) และการรับรู้สมรรถนะในการปฏิเสธการตั้ม ($\beta = -.47, p < .001$) เป็นปัจจัยที่มีอิทธิพลต่อการตั้มแอลกอฮอล์ ในขณะตั้งครรภ์ เมื่อควบคุมปัจจัยอื่น ผลการศึกษาเสนอแนะว่าการพยาบาลเพื่อป้องกันและลดการตั้มแอลกอฮอล์ ในขณะตั้งครรภ์ควรเน้นที่การปรับเปลี่ยนความเชื่อที่ไม่ถูกต้องของหญิงตั้งครรภ์

คำสำคัญ: การตั้มแอลกอฮอล์ หญิงตั้งครรภ์ ความเชื่อเกี่ยวกับสุขภาพ การตั้มแอลกอฮอล์ก่อนตั้งครรภ์ การรับรู้สมรรถนะในการปฏิเสธการตั้ม

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Abstract

Alcohol consumption during pregnancy is both a global and national public health issue. Despite health messages urging women to stay on complete alcohol abstinence during pregnancy, studies report high prevalence of pregnancy drinking. Literature suggests that women's belief factors might play an important role in explaining alcohol consumption during pregnancy. Thus, this study examined alcohol consumption and the predicting factors of alcohol consumption during pregnancy among Bhutanese pregnant women. The Health Belief Model was used as a research framework. A systematic random sampling technique was employed to recruit a sample of 110 pregnant women visiting the antenatal clinic at Jigme Dorji Wangchuk National Referral Hospital, Bhutan. Data were collected through a face-to-face interview, using well-structured questionnaire. Results showed quite a high (43.6%) prevalence of alcohol consumption in this group of pregnant women. Multiple regression analysis revealed that pre-pregnancy drinking, perceived susceptibility, perceived severity, and drinking refusal self-efficacy together explained a statistical significance of 67% variance in alcohol consumption during pregnancy ($R^2 = .67$ Adjusted $R^2 = .65$, $F_{4,105} = 52.05$, $p < .001$). Moreover, perceived susceptibility ($\beta = -.20$, $p < .01$), severity ($\beta = -.24$, $p < .001$), perceived drinking refusal self-efficacy ($\beta = -.47$, $p < .001$) showed unique role as independent predictors of alcohol consumption during pregnancy. Findings suggest that women's belief factors play an important role in alcohol consumption during pregnancy. Interventions targeted to prevent alcohol consumption during pregnancy should aim at changing women's false beliefs about alcohol consumption during pregnancy.

keywords: alcohol consumption, pregnancy, pre-pregnancy drinking, health belief model, drinking refusal self-efficacy.

Introduction

The direct, indirect, and intangible problems related to alcohol use and abuse is becoming a pressing public health issue today. According to the World Health Organization's global status report on alcohol and health (2014), alcohol use and abuse is a component cause of more than 200 disease and injury conditions in individuals.¹ Alcohol has been established as a teratogen since 19th century.² Alcohol consumption during pregnancy is associated with pregnancy complications such as miscarriage, stillbirth, placental abruption, and premature birth.³⁻⁶ If survived through the grave pregnancy consequences of fetal life, babies are at the risk of being born with

low birth weight; suffer from complications of prematurity; and have problems related to cognition, behavior, and developmental delays.^{7, 8} The most severe form of effect on the fetus is fetal alcohol spectrum disorder. Fetal alcohol spectrum disorder is a broad term that describes a wide range of physical, cognitive, and behavioral problems in children exposed to alcohol during prenatal life.⁸ According to the Center for Disease Control and Prevention (2009), fetal exposure of alcohol is one of the largest preventable causes of birth defects and developmental problems in the United States.⁹ The American College of Obstetrics and Gynecology, the Center for Disease Control and Prevention, and the

World Health Organization, all advise pregnant women, as well as women who are planning to conceive, to stay on complete alcohol abstinence.¹⁰⁻¹²

Despite these facts and in spite of the health messages urging pregnant women to stay on complete alcohol abstinence, a substantial number of women across the globe drink alcohol during pregnancy. According to Cochrane collaboration review, more than 20% of pregnant women worldwide consume alcohol.¹³ Despite many research evidences suggesting pregnant women to stay on complete alcohol abstinence throughout pregnancy, other studies from across the world have reported a high prevalence of pregnancy drinking. Some 30.3% of pregnant women were drinking alcohol in the United States of America;¹⁴ 72% of Australian pregnant women reported that they did not comply with their national guideline of complete alcohol abstinence during pregnancy;⁵ and 26.6% of indigenous women in Taiwan were drinking alcohol throughout pregnancy.¹⁵ A recent study in a South African country showed rate still as high as 34.6% of pregnant women drinking alcohol.¹⁶ All these reported rates of alcohol consumption during pregnancy, from across the globe signify the magnitude of problem of pregnancy drinking. As far as the author is informed, there is only one study on pregnancy drinking in Bhutan and the findings showed that 25.3%, 23.7%, and 10.9% of pregnant women consumed alcohol in the past three months, one month, and one week respectively.¹⁷ In addition, Bhutan reported one of the highest per capita alcohol consumptions in South Asia with 8.47 liters, much higher than the global rate of 6.2 liters.¹⁸ Moreover, alcohol related morbidity was ranked among top five killers by a

recent national health survey and the report predicted that alcohol is likely to become one of the main sources of disease burden in the country.¹⁹ With recent recognition of alcohol use and abuse as a rising public health issue in the country, the Royal Government of Bhutan targets to reduce alcohol related morbidity and mortality by 50% at the end of 2020.²⁰

Research studies seeking answers as to why a concerning number of pregnant women drink alcohol and how they can be helped, have all suggested numerous predictors but pre-pregnancy alcohol consumption remained to be the most significant predictor of alcohol consumption during pregnancy.^{5, 21-23} However, the role of this factor remains to be examined in alcohol consumption during pregnancy among Bhutanese pregnant women. The only previous study by Udon and Areesantichai (2012) among 312 Bhutanese pregnant women reported some 66% of the sample with pre-pregnancy drinking.¹⁷ In addition, although literature suggested numerous other predictors of alcohol consumption during pregnancy such as income, age, education, and so on, very few studies have focused on the role of women's belief factors. According to health belief model, it is what the person perceives and believes that make them want to act or behave in healthy or risky ways.²⁴ In fact, individual beliefs and perceptions are the most important determinants of healthy or risky behavior in individuals.²⁵ Previous studies have suggested that constructs of HBM such as perceived susceptibility, perceived severity, and perceived self-efficacy could significantly explain alcohol consumption behavior among adults, adolescents, college students, and even

pregnant women.²⁵⁻³⁰ However, a previous study on alcohol consumption during pregnancy had used only perceived susceptibility and perceived severity variables of HBM and did not use perceived self-efficacy. Pregnant women perceiving alcohol as a risk to pregnancy and fetal health leading to severe consequences are less likely to drink alcohol during pregnancy.²⁸ The perceived self-efficacy of HBM is often referred as drinking refusal self-efficacy in alcohol studies.^{26, 29} Though drinking refusal self-efficacy claims to have a significant role in explaining alcohol consumption in other sections of population such as adults, adolescents, and college students, its role in alcohol consumption during pregnancy remains to be explored.

Therefore, this study guided by both theory and literature used the Health Belief Model as the research framework. There were four factors that were examined in this study; pre-pregnancy alcohol consumption was derived from previous literature on alcohol consumption during pregnancy and the perception factors such as perceived susceptibility, perceived severity, and perceived drinking refusal self-efficacy were derived from the theory-HBM. Thus, the study was aimed at examining alcohol consumption and the predicting factors of alcohol consumption among Bhutanese pregnant women. Defining the role of women's perception and belief factors in alcohol consumption during pregnancy will allow health care providers, who are in charge of women's total antenatal care, to see the issue of alcohol consumption during pregnancy through the lenses of women's beliefs, which is a whole new dimension aimed to broaden the aspect of existing antenatal care.

Methodology

Study setting and sample. Participants were pregnant women visiting antenatal care at Jigme Dorji Wangchuk National Referral Hospital, Thimphu, Bhutan. They were selected using a systematic random sampling technique and 110 women were selected based on the following inclusion criteria: (1) Bhutanese national aged ≥ 18 years, (2) gestational age ≥ 12 weeks, (3) pregnancy without medical complications, and (4) both singleton and multiple pregnancies. For this predictive design study, sample size was calculated using the formula for predictive design sample size calculation by Green 1991 (cited in Tabachnick & Fidell, 2007),³¹ which has the sample (n) should be $\geq 104 + m$ (the number of independent variables) = 108 and rounded up to 110.

Instrumentation. This study employed five types of instruments: questionnaire for demographic information, Alcohol Use Disorder Identification Test-Consumption (AUDIT-C), Perceived susceptibility questionnaire (PsuQ), Perceived severity questionnaire (PseQ), and Drinking Refusal Self-efficacy Questionnaire-Revised (DRSEQ-R). The AUDIT-C and DRSEQ-R are standard tools with good reliability and validity and were used for the same purpose in many previous studies.^{25-27,32} The questionnaire for demographic information, PsuQ, and PseQ were developed by the principal investigator based on theory and literature review.

Alcohol consumption during pregnancy, defined in this study as consumption of any amount and frequency of alcohol containing drink during current pregnancy, was measured using the standard tool, 'Alcohol Use Disorder Identification Test-

Consumption' (AUDIT-C). The AUDIT-C is a 3-item tool available for public use, initially developed by the World Health Organization as a 10-item AUDIT tool and later modified to be the 3-item AUDIT-C. Based on AUDIT-C scoring of hazardous drinking, a score of 3 or more was considered as drinking at hazardous level. Pre-pregnancy alcohol consumption, defined in this study as pregnant women's alcohol consumption in past one year before the current pregnancy, was also measured by the AUDIT-C.

Perceived susceptibility was defined as pregnant women's belief about the alcohol consumption as a risk to her pregnancy and fetus. This was measured by Perceived Susceptibility Questionnaire (PsuQ) developed by the principal investigator based on literature review and definition of perceived susceptibility construct of HBM. The PsuQ tool has 10-items and pregnant women's perceived susceptibility was measured on a 4-point Likert scale. Higher scores meant higher perceived susceptibility.

Perceived severity was defined as pregnant women's belief about the seriousness of the consequences of alcohol consumption during pregnancy. This was measured by the Perceived Severity Questionnaire (PseQ) also developed by the principal investigator based on literature and the definition of perceived severity construct of HBM. The PseQ also has 10-items and pregnant women's perceived severity of alcohol consumption during pregnancy was measured on a 4-point Likert scale. Higher score meant higher perceived.

Perceived drinking refusal self-efficacy was defined as pregnant women's belief that she is

able to resist, refuse, or turn down alcohol on different occasions such as social, emotional, and opportunistic. It was measured by the Drinking Refusal Self-efficacy Questionnaire-Revised (DRSEQ-R), which has 19 items. This tool was developed by Oei, Hasking, and Young (2005) and the current study used the original tool without modification but with deletion of two items (item 16 & 17) as they were not suitable for our context of drinking³¹. Higher score meant higher perceived self-efficacy by pregnant women to refuse drinking alcohol.

Researcher developed instruments were tested for content validity by a panel of five experts. The average item level content validity index (I-CVI) was .98 for PsuQ and .94 for PseQ. For testing the reliability of the instruments, a pilot study was conducted with a sample of 30 pregnant women and the Cronbach's alpha was .96 for PsuQ and .97 for PseQ. Moreover, DRSEQ-R was also tested for reliability as this questionnaire though used widely among alcohol studies in other sections of population as adults, adolescents, and college students²⁵⁻²⁷ it was not used to study pregnancy drinking. The Cronbach's alpha for DRSEQ-R was .79.

Data collection. This study was approved by the Institutional Review Board for Graduate Studies, Faculty of Nursing, Burapha University (IRB approval number: 01-01-2558) and the Research Ethics Board of Health (REBH), Ministry of Health, Bhutan. Pregnant women meeting the study criteria were recruited from the antenatal clinic registration counter and were approached with study information and invitation letter while they were waiting for routine antenatal check-up.

Women were informed that their participation in the study was voluntary and if they were willing to participate, they were assured of their anonymity and safety. After they were done with their routine antenatal care, only then they were interviewed face-to-face in a comfortable warm room for about 10–15 minutes, using structured interview questionnaire.

Data analysis. Data were analyzed using statistical software and the level of significance was set at .05. Descriptive statistics, Wilcoxon signed rank test, and standard multiple regression were performed. Descriptive statistics commands such as mean, standard deviation, frequency, percentage, and range were used to provide general picture of the sample of the study. Wilcoxon signed rank test was used to compare the alcohol consumption between pre-pregnancy and during current pregnancy. Standard multiple regression analysis was done to

examine the factors predicting alcohol consumption during pregnancy including pre-pregnancy alcohol consumption, perceived susceptibility, perceived severity, and perceived drinking refusal self-efficacy.

Results

The age of participants ranged from 19 to 39 and majority (77.2%) of them were in the age group of 21–30 years. Most of the women sampled had only completed middle secondary school (30%) while 26.4% of them had never been to school. Almost half of the participants were housewives (46.4%) with no monthly income of their own (43.6%) and 23.6% of them were private employees. Majority of the women were in third trimester pregnancy (86.4%) and there was almost equal distribution of primiparous (44.5%) and multiparous (55.5%) in the sample.

Table 1 Frequency and percentage of sample's demographic characteristics (n = 110)

Variables	Frequency	Percent (%)
Age (years) Mean = 26.38, SD = 4.47, Range = 19–39		
< 20	8	7.25
21–30	85	77.25
31–40	17	15.50
Education level		
No education	29	26.35
Primary (6 years)	10	9.10
Lower secondary (8 years)	7	6.35
Middle secondary (10 years)	33	30.00
High secondary (12 years)	25	22.70
Degree or higher (≥ 15 years)	6	5.50

Table 1 Frequency and percentage of sample's demographic characteristics (n = 110) Cont.

Variables	Frequency	Percent (%)
Occupation		
Housewife	51	46.36
Private employee	26	23.64
Civil servant	18	16.36
Business	7	6.36
Farmer	6	5.45
Others	2	1.82
Monthly income (Ngultrums) Mean = 5,758.18 (approximately USD 93.3) SD = 7,211.69, Range = 0-30,000		
No income	48	43.60
< 10,000	39	35.50
10,001-20,000	18	16.40
> 20,000	5	4.50
Gestational age		
Second trimester (12-24wks)	15	13.60
Third trimester (>24wks)	95	86.40
Number of birth Mean = 0.79, SD = 0.85, Range = 0-3		
0	49	44.50
1	39	35.50
2	18	16.40
3	4	3.60

In the sample of 110 pregnant women, 70.9% had consumed alcohol in one year prior to current pregnancy. Majority of pre-pregnancy drinkers had non-hazardous level of drinking (54.5%), while 16.4% of them had hazardous drinking level. There were almost equal number of women who consumed alcohol during pregnancy (43.6%) and those who abstained from alcohol during pregnancy current

pregnancy (56.4%), indicating quite a high rate of pregnancy drinking in the sample. However, all pregnancy drinking had occurred at non-hazardous level except for one participant. When the alcohol consumption during pre-pregnancy and current pregnancy was compared by Wilcoxon signed rank test, a statically significant difference was seen between the two, indicating the change in alcohol

consumption during pregnancy compared to the consumption during pre-pregnancy. The sample showed moderate perceived susceptibility ($\bar{X} = 30.15$),

and quite high perceived severity ($\bar{X} = 36.40$) and perceived drinking refusal self-efficacy ($\bar{X} = 95.92$).

Table 2 Levels of alcohol consumption during pre-pregnancy and current pregnancy

Alcohol consumption	Pre-pregnancy		During pregnancy	
	Frequency	%	Frequency	%
Never (0 score)	32	29.10	62	56.40
Had non-hazardous drinking (1-2 scores)	60	54.50	47	42.70
Had hazardous drinking (≥ 3 scores)	18	16.40	1	0.90

Table 3 Range, mean, and standard deviation perceived susceptibility, severity, and drinking refusal self-efficacy

Variables	Possible range	Actual range	Mean	SD
Perceived susceptibility	1-40	20-40	30.15	5.04
Perceived severity	1-40	10-40	36.40	4.38
Perceived drinking refusal self-efficacy	1-102	82-102	95.92	6.50

Pearson's product moment correlation analysis showed alcohol consumption during pregnancy significantly ($p=.001$) correlated with pre-pregnancy drinking ($r=.57$), perceived susceptibility ($r=-.57$), perceived severity ($r=-.5$), and perceived drinking refusal self-efficacy ($r=-.75$). Standard multiple regression analysis revealed that pre-pregnancy drinking, perceived susceptibility, perceived severity, and perceived drinking refusal

self-efficacy could together explain a statistically significant 67 % variance in alcohol consumption during pregnancy ($R^2 = .67$, $Adjusted R^2 = .65$, $F_{4,105} = 52.05$, $p < .001$). Out of the four predictors entered, perceived drinking refusal uniquely acted as the most independent significant predictor of alcohol consumption during pregnancy ($\beta = -.47$, $p=.001$) followed by perceived severity ($\beta = -.24$, $p=.001$) and perceived susceptibility ($\beta = -.20$, $p=.01$).

Table 3 Multiple regression analysis for factors predicting alcohol consumption during pregnancy

Predictor variables	B	Se B	Beta	t	p-value	
Pre-pregnancy drinking	.06	.04	.12	1.52	.13	Intercept = 6.11***
Perceived susceptibility	-.02	.01	-.20	-2.86	.01	$R^2 = .67$
Perceived severity	-.03	.01	-.24	-3.74	.00	
Perceived drinking refusal self-efficacy	-.04	.01	-.47	-5.26	.00	$F_{4,105} = 52.05***$

DV = Alcohol consumption during pregnancy, ** $p < .01$, *** $p < .001$, B = un-standardized beta coefficient, Se B = standard error, Beta = standardized beta coefficient, t = t-test statistics.

Discussion

Alcohol consumption during pregnancy was quite high in this sample of pregnant women. Some 43.6% of the sample drinking alcohol during pregnancy is relatively higher rate than the rates reported by the only previous study on pregnancy drinking in the county¹⁷ and from other parts of the world. A very recent (2014) study from a South African country reported some 34.6% of pregnant women drinking alcohol during pregnancy¹⁶ and according to another study, 30.3% of pregnant women in the United States of America drank alcohol during pregnancy.¹⁴ A relatively higher rate of pregnancy drinking in our study could be because of changing demographics and gender roles with socio-economic development of the country in recent years. A definite answer for the higher prevalence of pregnancy drinking in our population is the well groomed drinking culture that we live in, where the culture don't stigmatize women drinkers or they enjoy the freedom to alcohol use as much as men do. Alcohol studies from other parts of the world concluded that alcohol consumption is not only

significantly associated with easy accessibility and availability of alcohol but also the easy acceptability of drinking behavior by the community increased alcohol use. Moreover, the only previous study in Bhutan on pregnancy drinking reported that pregnant women drank alcohol during pregnancy for various reasons such as to promote sleep, positive believe of physical and psychological benefit from alcohol use, culture and tradition, and not being able to refuse alcohol when offered by their family and friends.¹⁷ It is also believed that alcohol consumption kept people warm during the cold winter months in Bhutan as evident from increased alcohol sell and consumption during winter months. Thus, the quite a high prevalence of pregnancy drinking among this sample of pregnant women could be because of so many factors such as the favorable drinking culture in the country, high altitude and cold weather, easy accessibility and acceptability of alcohol use, false beliefs related to benefits of alcohol use.

In addition, similar to the pregnancy drinking patterns reported in previous studies, alcohol consumption during pregnancy occurred at

non-hazardous level of 1 or 2 standard drinks and there was a significant reduction in hazardous level of drinking from 16% pre-pregnancy to .9% during pregnancy.^{12, 22} This is an indication that, although many pregnant women drink alcohol, most of them understand that alcohol consumption during pregnancy is harmful, especially the hazardous level of drinking and thus, they quit drinking at hazardous levels during pregnancy. Never the less, health organizations and recent research evidences suggest complete alcohol abstinence as the safest choice during pregnancy; therefore, a mere reduction in hazardous level drinking may not be enough and women's efforts need to be fostered and encouraged if we are to achieve the goal of complete alcohol abstinence during pregnancy. A study from Sweden (2013) reported 84% of their study samples drinking prior to pregnancy and 14.6% of them drinking at hazardous level.²² The pre-pregnancy drinking rate and characteristics in our study is very similar to this study from Sweden as our results also showed both higher pre-pregnancy drinking and hazardous level of drinking. However, while our result was 43.6%, the Swedish sample showed only 6% of them drinking alcohol during pregnancy despite both higher rates of pre-pregnancy drinking and hazardous level of pre-pregnancy drinking. Many previous studies report pre-pregnancy drinking as one of the most significant predictor of alcohol consumption during pregnancy. Moreover, alcohol drinking habit is not something that women can change overnight on becoming pregnant. Therefore, it would be very interesting and educative to give some thoughts on how this could have happened and what could have happened in between

the pre-pregnancy drinking and pregnancy drinking time periods, leading to a significant reduction in alcohol consumption during pregnancy. This is no miracle but looks like an effective antenatal care system that have helped women with pre-pregnancy drinking to stop drinking alcohol on becoming pregnant. This also signifies that antenatal clinics might be the right place to help women with alcohol consumption during pregnancy, which although might be little late a preventive care to ensure complete fetal alcohol exposure as most women are 6 to 8 weeks pregnant by the time they visit clinic. Never the less, a good assessment tool and well planned alcohol interventions at the antenatal clinics will prevent further damage, prevent those who might be at risk of getting exposed in flowing trimesters or pregnancies, and might address the alcohol issues of women in general.

Findings demonstrated that pre-pregnancy alcohol consumption, perceived susceptibility, perceived severity, and perceived drinking refusal self-efficacy could predict alcohol consumption during pregnancy. While these four factors, together explained a significant 67% variation in alcohol consumption during pregnancy among Bhutanese pregnant women, pre-pregnancy drinking did not show any unique role as an independent predictor of alcohol consumption during pregnancy. Pre-pregnancy drinking was quite high among the sample and based on AUDIT-C scoring of hazardous drinking, one-fourth of the prior drinkers had alcohol at hazardous level of drinking. Our study results showing a significant association between pre-pregnancy drinking and alcohol consumption during pregnancy confirmed the findings of previous

studies.^{5,21-22} Previous studies concluded that women with pre-pregnancy drinking habits were more likely to drink during pregnancy. Yen and colleagues (2012), in their study among indigenous Taiwanese pregnant women showed that pre-pregnancy drinking was the most significant predictor of alcohol consumption during pregnancy and as many as 52% of pre-pregnancy drinkers continued to drink during pregnancy.¹⁵ Therefore, assessing pre-pregnancy drinking and the characteristics of drinking will help to identify women who might be at risk of alcohol consumption during pregnancy. In addition, women with hazardous level of pre-pregnancy drinking are not only at risk of drinking during pregnancy but also at risk of unintentionally exposing their fetus to high doses of alcohol during the early months of pregnancy, when fetus is in its most vulnerable form and women are not aware of the conception as most pregnancies are recognized not earlier than 4–8 weeks of gestation. Moreover, women who drink at hazardous level pre-pregnancy drinking are at risk of entering into pregnancy with poor maternal health during pregnancy. Thus, pre-pregnancy drinking factor plays an important role in alcohol consumption during pregnancy and interventions targeted to prevent fetal alcohol exposure should begin with assessment and correction of pre-pregnancy drinking.

Based on the concept of HBM, we hypothesized that, Bhutanese pregnant women who believed alcohol consumption during pregnancy to be a risk to pregnancy and fetus, who perceived that the pregnancy and fetal consequences of alcohol consumption during pregnancy were severe, and who perceived self-efficacious to refuse alcohol during

pregnancy were less likely to drink alcohol during pregnancy.

It did not come as a surprise when the sample, which had a high rate of alcohol consumption during pregnancy, showed only moderate level of perceived susceptibility, given the negative association between the two. Most women in the sample did not believe that consuming alcohol during pregnancy could put them at risk of many pregnancy and fetal complications; hence, higher rate of pregnancy drinking in the sample. The perceived severity and perceived drinking refusal self-efficacy were quite high among our sample. In particular, Bhutanese pregnant women viewed consequences related to physical symptoms such as facial abnormalities as more severe than emotional and cognitive related consequences such as lower IQ and anti-social behaviors. As for perceived drinking refusal-efficacy, while Bhutanese women perceived least self-efficacious to refuse alcohol drinks when their friends were drinking or when someone offered them a drink or when they were at dinner, they were not much of an emotional drinker as they perceived most self-efficacious to refuse alcohol while sad or nervous or angry. In line with the previous study findings perceived susceptibility, perceived severity, perceived drinking refusal self-efficacy did not only show strong association with alcohol consumption during pregnancy but also each of these factors showed a unique role as an independent predictor of alcohol consumption during pregnancy. Therefore, pregnant women who did not perceive alcohol consumption during pregnancy as a risk to fetus, who did not perceive the consequences of pregnancy drinking as severe, and who perceived that they were less

self-efficacious to refuse drinking during pregnancy were more likely to drink alcohol during pregnancy. Thus, it is confirmed that pregnant women's perception and belief factors play an important role in explaining alcohol consumption during pregnancy, reaffirming the theory of Health Belief Model.^{24,25}

Limitations

Some of the limitations to this study are: firstly, had this study included only those women nearing end of their pregnancy (37–41 weeks), this would have captured the whole 7–8 months of drinking experience. Secondly, the data collection though was done in an area where the population could represent the whole country; it is still possible that it will limit generalization to women in other parts of the country where the drinking environment might differ. Lastly, data was collected during the winter months in Bhutan (February and March) and around that time, it was Bhutanese New Year; the cold weather and festive mood might have altered women's alcohol consumption.

Implications

Findings of this study reaffirm the Health Belief Model's effectiveness in predicting risky behavior such as alcohol consumption during pregnancy. The findings can be used by health care providers, especially nurse-midwives at antenatal clinics in assessment of women at risk of pregnancy drinking. Since the belief factors play an important role in determining alcohol consumption during pregnancy, alcohol related interventions for pregnant women should incorporate interventions that can change women's false belief about pregnancy

drinking and boost women's self-efficacy to refuse alcohol drinks during pregnancy. In addition, early detection and correction of pre-pregnancy drinking at women's health clinics may prevent alcohol consumption during pregnancy and the fetal alcohol exposure.

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