ASSESSMENT OF ALCOHOL CONSUMPTION AMONG PREGNANT WOMEN IN ANTENATAL CLINIC (ANC) AT JIGMI DORJI WANGCHUK NATIONAL REFERRAL HOSPITAL (JDWNRH), THIMPHU, BHUTAN

Ms. Pema Udon

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การประเมินการดื่มสุราในกลุ่มหญิงตั้งครรภ์ที่คลินิกฝากครรภ์ ในโรงพยาบาลเจดีดับบลิว เอ็นอาร์เอช เมือง ทิมปู ประเทศ ภูฐาน

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วิทยานิพนธ์เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาสาธารณสุขศาสตรมหาบัณฑิต
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เพมา อูดอน: การประเมินการดื่มสุราในกลุ่มหญิงตั้งครรภ์ที่คลินิกฝากครรภ์ในโรงพยาบาลจิกมี ดอร์จิก วังชุก เมืองทิมพู ประเทศภูฏาน (ASESSMENT OF ALCOHOL CONSUMPTION AMONG PREGNANT WOMEN IN ANTENATAL CLINIC (ANC) AT JIGMI DORJI WANGCHUK NATIONAL REFEREEAL HOSPITAL (JDWNRH), THIMPHU, BHUTAN). อ. ที่ปรึกษาวิทยานิพนธ์หลัก: อ. ดร. จิตรลดา อารีย์สันติชัย, 100... หน้า

การดื่มสุราในกลุ่มผู้ชาย ผู้หญิง และเด็ก ในประเทศภภูฏานเป็นการปฏิบัติและเป็นที่ยอมรับกันอย่างกว้างขวาง โดยเฉพาะการดื่มสุราที่ทำขึ้นเองในกลุ่มมารดาหลังคลอด ด้วยความเชื่อที่ว่าจะช่วยสร้างน้ำนม และช่วยสร้างความอบอุ่นให้มารดาหลังคลอดมากขึ้น การศึกษาภาคตัดขวางนี้จัดทำขึ้นเมื่อเดือนมิถุนายน 2554 วัตถุประสงค์เพื่อประเมินการดื่มสุราในกลุ่มหญิงตั้งครรภ์ที่คลินิกฝากครรภ์ในโรงพยาบาลจิกมี ดอร์จิก วังชุก เมืองทิมพู ประเทศภูฏาน โดยใช้แบบคัดกรองภาวะของผู้ที่ดื่ม หรือ AUDIT และแบบสอบถามกับกลุ่มหญิงตั้งครรภ์ จำนวน 312 คน ผลการศึกษาพบว่าก่อนการตั้งครรภ์มีการดื่มตลอดเวลาคิดเป็นร้อยละ 65.1 หนึ่งปีที่ผ่านมามีการดื่มร้อยละ 52.9 จากจำนวนผู้ดื่ม 203 คน พบว่ามีกลุ่มหญิงที่ดื่มระหว่างตั้งครรภ์ในสามเดือนผ่านมาร้อยละ 25.3 หนึ่งเดือนผ่านมาร้อยละ 23.7 และหนึ่งสัปดาห์ผ่านมาดื่มร้อยละ 10.9 จากเครื่องดื่มที่มีแอลกอฮอล์ 9 ประเภท เครื่องดื่มที่ดื่มมากที่สุดในการสำรวจครั้งนี้คือ ไวน์ข้าว ที่ทำเอง เรียกว่า “ชางคี” และ “อาร่า” รองลงมาคือ เบียร์และไวน์ที่จำหน่ายในท้องตลาด เหตุผลหลักของการดื่มคือ ธรรมเนียมประเพณีปฏิบัติสืบต่อกันมา และวัฒนธรรม โดยผู้หญิงมีความรู้สึกแง่บวกต่อการบริโภคเครื่องดื่มที่ทำเองและการดื่มช่วยให้หลับสบาย

อย่างไรก็ตาม แม้ว่าร้อยละ 92 ของกลุ่มหญิงตั้งครรภ์ทราบเกี่ยวกับผลของสุราต่อทารกในครรภ์ แต่ก็ยังมีการดื่มสุราอย่างต่อเนื่อง ดังนั้น หญิงตั้งครรภ์ควรรู้จักระวังในการดื่มสุราและควรแนะนำให้งดการดื่มสุราจนกว่าจะพ้นภาวะการตั้งครรภ์ การให้สุขศึกษาและข้อมูลที่ถูกต้องเกี่ยวกับแอลกอฮอล์และการตั้งครรภ์ในกลุ่มดังกล่าว จะต้องดำเนินการศึกษาอย่างเจาะลึกต่อในทุกโรงพยาบาลของประเทศภูฏานที่ซึ่งมีการดื่มแอลกอฮอล์ที่ทำเองอย่างกว้างขวางเพื่อเป็นประโยชน์ในการดำเนินการอย่างเหมาะสมต่อไปในอนาคต

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Drinking alcohol by men, women and children is widely accepted and practiced in Bhutanese society. Homemade alcohol is used by post-natal mothers with a belief it increases flow of breast milk for baby and promote comfort and healing for mother. This cross-sectional descriptive study was conducted in June 2011 with an objective to access alcohol consumption among pregnant women attending antenatal clinic at Jigme Dorji Wangchuk National Referral Hospital (JDWNRH) in Thimphu, Bhutan. Structured questionnaires and alcohol use disorder identification test (AUDIT) questions were used for face to face interview with 312 pregnant women. Data was analyzed using SPSS. Lifetime alcohol consumption was 203 (65.1%), last one year drink 165 (52.9%), last three months 79 (25.3%) last one month 74 (23.7%) and last one week was 34 (10.9%). Out of nine types of alcohol listed for this study pregnant women mostly consumed homemade rice wine called *"changkey"* and distilled alcohol drink *"ara"*. Commercial products women mostly consume were beer and wine. The main reason for alcohol consumption was tradition, culture and customs and women had positive feelings towards alcohol especially homemade alcohol. They also drank to promote sleep and comfort.

Although 92% of pregnant women heard about effects of alcohol on fetus, they still continued drinking during pregnancy. Therefore, all pregnant women should be screened for alcohol consumption and advised to abstain from drinking during entire pregnancy. In-depth studies with special focus on homemade alcohol are recommended in all the ANC clinics in the country for appropriate future interventions.

Field of Study: Public Health ..... .Student's Signature:.....

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CHAPTER I
INTRODUCTION

1.1 Background

World Health Organization estimates that approximately 2 billion people worldwide drink alcohol and 76.3 million of consumers are diagnosed with alcohol use disorders (WHO, 2004). The worldwide per capita consumption in 2005 among aged 15 years or older was 6.13 liters of absolute alcohol (WHO, 2011). Alcohol is responsible for death and disability of people at a relatively young age resulting in the loss of many years of life. The alcohol constitutes almost 4% of the death worldwide, which is even greater than the death caused by the HIV/AIDS, tuberculosis and violence (WHO, 2011). The Global burden of disease study (1996) estimated that in 1990 alcohol was responsible for 773,600 deaths and 47.7 million disability adjusted life years (DALY) lost worldwide (Murray and Lopez, 1996). A similar study conducted in 2000 revealed 1.8 million death and 58 million disability adjusted life years (DALY) lost worldwide (WHO, 2002). This indicates that the number of alcohol attributable deaths has doubled while the number of years with disabilities increased tremendously over the decade. Alcohol is responsible for more than 60 types of the diseases and the injuries and other 200 related components, which results in approximately 2.5 million deaths each year (WHO, 2011). According to WHO report 2004, alcohol consumption during pregnancy is related to various risks to the fetus, which include gross congenital anomalies and Fetal Alcohol Spectrum Disorders (FASD), a condition such as fetal alcohol syndrome, serious neurobiological dysfunctions, and mental retardation. The prenatal exposure to alcohol also include lethal consequences like spontaneous abortion, low birth weight, fetal damage, prematurity, and intrauterine growth retardation (Abel, 1997; Bradley et al., 1998; Windham et al., 1997).

The Global Status Report on Alcohol, 2004 in South East Asia Region alcohol related harm contributes 3.9 million disability adjusted life years (WHO, 2004). The alcohol consumption is declining in the five other Region of WHO, but South East Asia Region countries shows gradual increase in consumption over the past two decades (WHO, 2007). Recognizing the public health problems caused by harmful use of alcohol, the Regional Committee in September 2001 adopted a resolution-SEA/RC54/R2, urging Member States to further strengthen the policies and programs on alcohol related problems, mental health and drug abuse.

Unrecorded alcohol consumption which is homemade or illegal produce is an important issue which accounts for nearly 30% of total worldwide adult consumption (WHO, 2011). In South East Asia Region countries, the unrecorded alcohol consumption accounts for 69.0% of total APC (WHO, 2011). According to World Health Report on Alcohol 2011, in Bhutan unrecorded per capita alcohol consumption is 0.3 liters of pure alcohol and recorded is 0.2 in the year 2003-2005 (WHO, 2011). This is because homemade alcohol exceeds industrial production (WHO, 2004). About 50% of the household food grains harvested are used for brewing alcohol. (WHO, 2004).

Consumption of alcohol is widely accepted in the Bhutanese society (WHO, 2004) and it is used during celebrations and festivals, ceremonies and rituals. The use of alcohol is mostly favored by the general Bhutanese society owing to its attachment embedded to culture, tradition, customs and norms. Bhutanese view drinking as social act where drinking and occasionally getting drunk is accepted as a part of everyday life (Dorji, 2004). In certain society, alcohol is used by postnatal mothers from the time a baby is born and it is offered to the people who come to see newborn baby. There are stories that children are put to sleep by inducing small amount of alcohol so that parents who are farmers can work in the field. Children are indirectly trained to drink alcohol by feeding residue egg fried in butter and alcohol when adults drink alcohol. There is not social stigma for women drinking in Bhutan especially after they attain adulthood which is at the age of eighteen.

Information Communication and Education for Heath (IECH), 2001 study on health behavior in 12 of the 20 districts with 1035 samples revealed that 40% of the respondents drank alcohol and majority of the population drank home brewed alcohol (90%). It was further revealed that 42% were female and 50% male respondents drank alcohol (IECH, 2001). World Health Report 2007, in Bhutan, found that heavy episodes (60g or more of pure alcohol on at least one occasion weekly) of female and male drinkers between the age group of 15-85+ years is 3.7% and 8.3% (WHO, 2011). According to Annual Health Bulletin (AHB) 2010, of the total 1602 morbidity due to alcohol liver diseases reported to hospitals, 763 were females and 839 males (AHB, 2010). This clearly demonstrates that there is not much of gender difference when it comes to drinking alcohol for women and men in Bhutan.

Studies have found out that there is co-relation between alcohol uses during previous year with use during current pregnancy (Lee, et al, 2010). It is also well known that binge drinking leads to unplanned pregnancy and mothers continue drinking without knowing they are pregnant until several weeks of gestation. Study conducted by Floyed et al, found out that 45% of all women surveyed were consuming alcohol during the three months before they knew they were pregnant. 60% of women who reported alcohol consumption also reported that they did not know they were pregnant until after the fourth week of gestation (Floyed et al, 1999). Current practice of first visit to ANC by the pregnant mothers in Bhutan is 13 – 28 weeks of gestation (53.68%). Only few cases (9%) of mothers come to clinic before or at 12 weeks of gestation (JDWNRH, 2010). With high proportion of Bhutanese women drinking, chances are very high that women continue to drinking during pregnancy too and there is no study conducted in the past on alcohol consumption in pregnant women in ANC clinic in JDWNRH in particular. Therefore, to conduct this kind of study is very crucial in current situation. Pre-marital counseling for couple planning for pregnancy is not available in ANC clinics due to shortage of medical staff where abstinence of alcohol use can be addressed. Further, ANC clinics in Bhutan, screening for alcohol use during pregnancy is not a routine

activity. Therefore, this study aims to find alcohol consumption in pregnant women who come to ANC clinic during current pregnancy.

1.2 Research question

What is alcohol consumption in terms of ***frequency, quantity*** and ***type*** among pregnant women attending antenatal clinic at JDWNRH, Thimphu?

1.3 Objectives

To assess alcohol consumption in terms of ***frequency, quantity*** and ***type*** among pregnant women attending antenatal clinic at JDWNRH, Thimphu.

1.4 Operational definitions

1.4.1 Alcohol

Any beverage drinks that contain ethyl alcohol or ethanol (WHO, 2009)

1.4.2 Maternal Alcohol consumption

Alcohol beverages consumed by the woman during current pregnancy

1.4.3 Frequency

Number of days pregnant woman drink alcohol during current pregnancy measured in terms of weekly and monthly.

1.4.4 Quantity

Amount of alcohol consumed and it is measured by one standard drink

1.4.5 Type

Kind of either home-made alcohol or factory product

1.4.5 Pregnant Women

Women who are pregnant and have come to ANC visit to avail service at JDWNRH

1.5 Conceptual framework

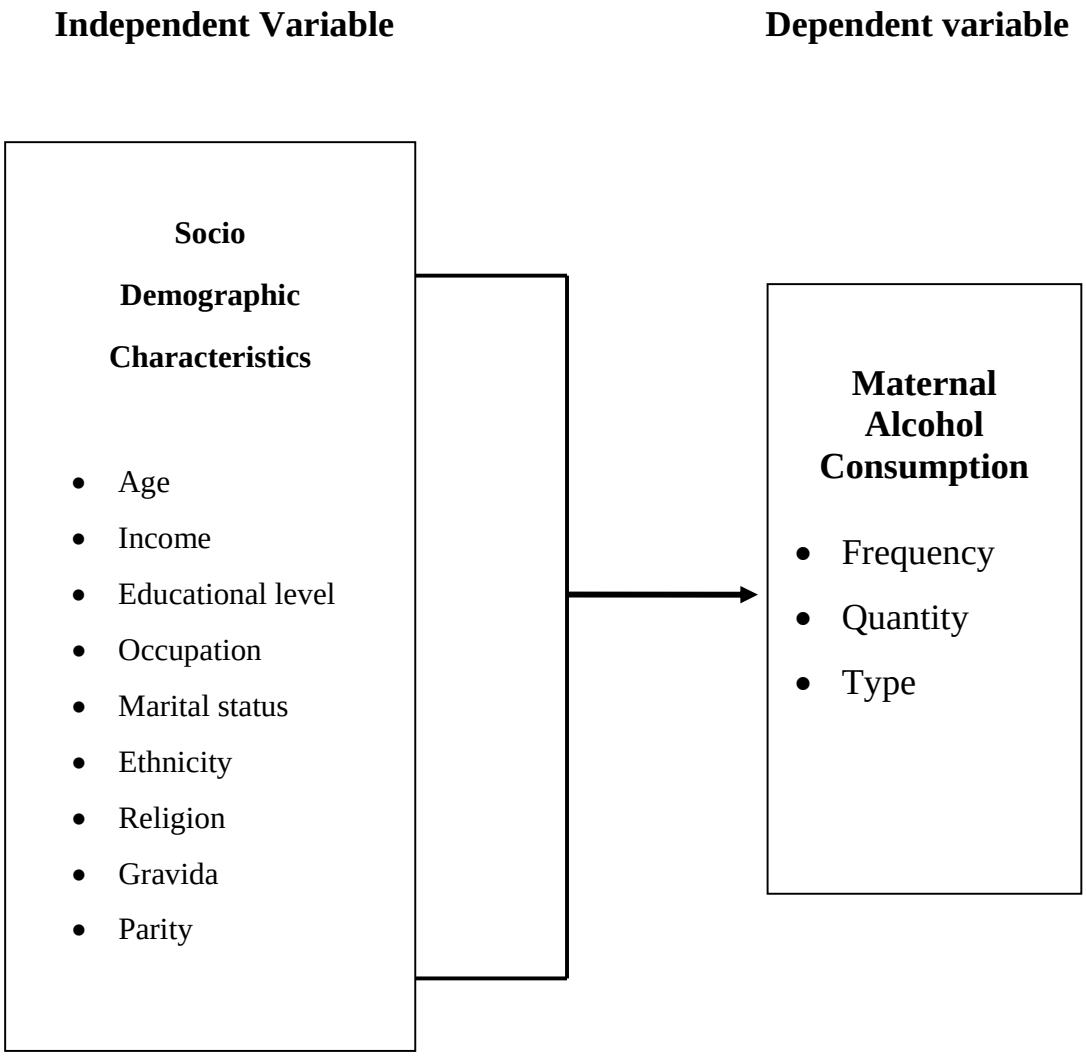


Figure 1 Conceptual framework

CHAPTER II

LITRATURE REVIEW

The following literature review focuses on five main headings as follows;

2.1 Alcohol 2.2 Pregnancy and alcohol

2.3 Antenatal care 2.4 Instruments

2.5 Timeline follow back (TLFB) 2.6 Standard drinks

2.7 Theories 2.8 Reviews of other studies

2.1. Alcohol

2.1.1. Alcohol production

Over four million people are involved with the alcohol industry (WHO, 2003). The fast pace of globalization of the economies in the South-East Asia Region (SEAR) has resulted in the local alcohol industry acquiring a new status with strategic tie ups with more established transnational companies and brands. With many parts of the world having reached stable and saturated consumption, and with the declining trend of alcohol consumption in the European Region and other traditional markets, these market lobbies are increasingly targeting new potential markets, especially in Asia (WHO, 2004a).

Types of Alcohol Beverages		
Beverages	**Source**	**Alcohol Content (Percentages)**
Brandy	Fruit juices	40 – 50
Whiskey	Cereal grains	40 - 55
Rum	Sugar cane & molasses	40 - 55
Wine	Grapes and other fruits	10 - 22
Beer	Cereals	4 – 8

Source: WHO SEARO 2003

Bhutan has two large distilleries that produce sufficient amount of various alcohol drinks to meet the demands in all 20 district in the country. Bhutan imports about 9 million liters of beer and a large volume of hard drinks from India and about 60,000 liters of third country liquor annually. Besides factory production Bhutanese brew alcohol from locally grown food grains. A survey conducted by the Agriculture Ministry in three districts revealed that a large portion of the food grains is used for alcohol. About 34% of wheat production, 31% of millet, 23% of maize, and 20% of rice were brewed into alcohol. Another study by the Trade Ministry found out that 50% to 90% of barley and up to another 50% of wheat were used for home brewed alcohol. (Wangdi, 2003). There are varieties of locally brewed alcohol that is available in Bhutan. To list few are *Ara* which is prepared by distilling from any fermented food grains, *Singchang* is like alcoholic juice extract from fermented food grains and *Bangchang* is similar except water is added. Both *Singchang* and *Bangchang* are like beer. *Changkey* is prepared from rice and it can be called as 'rice wine'.

Types of local alcohol brews in countries of South East Asia Region	
Country	**Local Brew**
Bangladesh	*Bangla Mad, Cholai, Tari*
Bhutan	*Ara*
India	*Arrack, Desi Sharab, Tari, Tharra, Toddy, Fenny*
Indonesia	Palm wine
Nepal	*Raksi, Tadi, Chayang, Tomb*
Sri Lanka	*Toddy, Arrack*
Thailand	*Oou, Krachae, Namtanmao, Sartha, Waark*

Source: Get high on life without alcohol-Report by WHO SEARO Region, 2003

2.1.2. Alcohol use

The extent of alcohol abuse related problems have a significant impact on public health.

In different societies, the proportion of alcohol use in different groups in the population vary accordingly. For example in neighboring country like India the alcohol prevalence is still low. As per some studies the per capita consumption is 2 litres per adult per year. However after adjusting for undocumented consumption which accounts for 45 to 50 percent of total consumption, it is likely to be around 4 litres (Alcohol Atlas of India, 2008). Pattern of alcohol consumption vary through the country, it is higher in north eastern states of India and women too tend to drink more in these states compared to other states. The prevalence of current alcohol use ranges from 7 percent in Gujurat to 75 percent in Arunachal Pradesh and consumption among women also ranges from low of 5 percent to significantly high in tribal, rural, and lower-socioeconomic urban section (Alcohol Atlas of India, 2008).

In Nepal according to the 2003 World Health Survey with total sample of 2613 with 1559 males and 1054 females participated the survey, heavy episode of drinking 40grams/day or more for male and 20 grams/day or more for female was 11.1 (total) with 12.3 males and 9.5 females (WHO, 2004) .

According to the 2003 World Health Survey, Nepal, on the total sample population (18 years and above) of 8633, with 3674 males and 4959 female, the life time alcohol abstainer for male was found 50.6% and 73.1% for female. Out of these sample population, the percentage of heavy and hazardous drinkers was found 3.0% for male and 4.0% for female with an average of 40g or more per day pure alcohol consumption (male) and 20g or more per day pure alcohol consumption (women). Also, it was found that the heavy episodic drinkers, at least once a week consumption of five or more standard drinks in one sitting was 3.0% for male and 0.3% for female (WHO, 2004).

In the another study conducted to assess the prevalence of alcohol dependence in the community of Dharan, Nepal, on the total sample size of 2344, with 1047 males and 1297 females, it was found out that 38.4% of males and 15.7% of females were alcohol dependent (WHO, 2004).

For Sri Lanka, the data of 2003 World Health Survey on a sample population of 18 years and above (total sample size 6114; Male 2878 and 3236 females) shows the life time abstainer from the alcohol consumption of 66.5% male and 98.2% female. The heavy and hazardous drinks were defined on the average consumption of 40g or more of pure alcohol a day for male was 4.7% and for female was 0.1%. Also, the heavy episodic consumption estimated on at least once a week of five or more standard drinks in one sitting was 4.9% for male and 0.1% for female (WHO, 2004).

In Thailand, the recorded adult (15+) alcohol consumption by type of alcoholic beverages (in % of pure alcohol), 2005 were 27% for beer, 73% for spirits and 1% for wine, and the per capita consumption, average 2003-2005 (in litres of pure alcohol) recorded was 6.4% and unrecorded was 0.7% (WHO, 2004). The Thailand National Household Survey on estimation of population of alcohol abuse in 2007 estimated that over 6 million alcohol users, which is more than half of all users, had a heavy drinking episodic, also known as binge drinking during the last twelve months (WHO 2009). The total economic cost of alcohol consumption in Thailand in 2006 was estimated at 156,105.4 million baht (9,627 million US$ PPP) or about 1.99% of the total Gross Domestic Product (GDP). The largest cost attributable to alcohol consumption is that of productivity loss due to premature mortality (104,128 million baht/6,422 million US$ PPP), followed by cost of productivity loss due to reduced productivity (45,464.6 million baht/2,804 million US$ PPP) (BMC Public Health, 2010).

Reports compiled from non-Muslim neighboring countries namely India, Nepal, Sri Lanka and Thailand, it is evident that women in these countries as well drink alcohol like Bhutanese women.

2.1.3 Alcohol related harm

According to health reports, alcohol is one of the three most common causes of deaths in Bhutan. In 2000, cardiovascular diseases topped the number of deaths with 21.5 percent followed by “injuries” (mainly due to road accidents) with 12.6 percent. Hospital records show that alcohol-related traffic accidents in Bhutan cause 38% of deaths mostly involving “young adults”. Cirrhosis, the most widely recognized disease caused by alcoholism, the damage to liver tissue with scars leading to liver failure and death, caused 11 percent of the deaths, the third largest number. Alcohol is responsible for a number of mental health problems like depression and anxiety suffered by 10 to 12 percent in psychiatric department in Thimphu hospital. They also treat other alcohol-related sicknesses like stroke, cancer and damage to the fetus in pregnant women. (Kuensel, 2002)

Alcohol consumption is a serious public health problem in Bhutan. Although no nationwide survey has been carried out in the country in the past, the data from hospitals and health centres indicates that alcohol is a leading cause of mortality and morbidity in middle aged Bhutanese men and women as we can see from the table in next page (causes of deaths in hospitals). One thousand people suffer from alcohol related health problems in the country every year and hundred dies which is responsible for as many as 30% of all deaths in the adults in the hospitals. Annual Health Bulletin (AHB) 2008 showed that alcohol is one of the leading causes of deaths and number one killer in adults in Bhutan (AHB, 2008).

Causes of Deaths in Hospitals

Diseases	2005	2006	2007	2008	2009	Rank
Alcohol liver diseases	92	104	98	98	133	1st
Neonatal death	52	81	84	123	83	2nd
Other circulatory diseases	77	88	55	88	75	3rd
pneumonia	44	59	39	59	57	4th
Other cancers	40	45	60	48	61	5th

Source: Adapted from Annual Health Bulletin, Ministry of Health Bhutan, 2010

Cases Reported by Hospital

Disorder	2005	2006	2007	2008	2009	Rank
Alcohol liver diseases	1217	1531	1471	1329	1602	1st
Epilepsy	1008	1205	1220	1156	1104	2nd
Other mental disorders	565	734	647	755	732	3rd
Depression	444	524	712	739	621	4th
Anxiety	381	302	324	392	513	5th
Psychosis	122	130	121	126	87	6th

Source: Adapted from Annual Health Bulletin, Ministry of Health Bhutan, 2010

From the above two tables we can see that alcohol is the leading cause of deaths in the hospitals and also alcohol liver disease is the highest cases reported in the hospital.

2.1.4 Factors influencing alcohol consumption

2.1.4.1 Age

Anyone who begins drinking in adolescence is at risk for developing alcoholism. People with a family history of alcoholism are more likely to begin drinking before the age of 20 and become alcoholic. Even in Bhutan although law exist that the sale of alcohol is prohibited under age of 18, many adolescence are found drunk especially in discotheques, parties, and gatherings.

With the increased drug and alcohol use problem among Bhutanese women, rehabilitation centre for women was opened in Thimphu *Serbaythang* to help women recover from the harmful habits of drinking (BBSC, 2010).

2.1.4.2 Religion, tradition and culture

From the religious point of view, it is clearly stated in some of the historical scriptures that alcohol is used as one of the holy elements of offering during the rituals. These are apparent in the forms of; *duetsi*, which is believed to have acquired divine blessing after the ritual performances, is being offered to the worshippers at the end. Secondly, *marchang*, is performed in a large gathering to evoke the deities' blessing on embarkation of any ventures. Also *Serkem* is offered to the deity in grant of wish or blessing on happening of the new venture. In Bhutanese theology, the application of alcohol has been one of the integral parts for the completion of religious ceremonial offerings, which is known to be one of the auspicious offerings that are required to sanctify.

Since historical times, the use and abuse of alcohol has been a universal phenomenon with no particular boundaries. The massive economic changes and urbanization process in the last decade of the previous century has thrown up new challenges. Alcohol consumption patterns are changing fast making it more difficult to comprehend the problem and implement a solution (WHO, 2003). Socio-cultural practice

exert strong influence over drinking pattern as evidenced by the marked differences in the incidence of alcoholism and how alcohol affects conduct in different cultural, ethnic, socioeconomic and occupational group (SIRC, 1998).

If the use of alcohol has to be cited in the Bhutanese tradition, indiscriminatingly these practices have been following since the ancient time and till now. It has strong adaptation, engrained in the mind of every Bhutanese as a normal way of consumption, rather than taking it as a source of predicament in ones lives. Thus, the strong values on tradition and culture have remained totally embedded in the Bhutanese conception of alcohol consumption as a social norm. Usually, alcohol occupies as pre-conception of offering/present, if any Bhutanese had to make a visit to new friends, guests, and on other festivities. It is also presented as an honor and hospitality to the high officials and elders.

Cultural practices, rather than religion strongly appear to influence alcohol consumption in the SEAR. Though Buddhism advocates abstention from alcohol, the three predominating Buddhist countries, Bhutan, Sir-lanka and Thailand have very different rates of alcohol consumption.

Culture plays a very important role in Bhutanese society. Drinking by both men and woman is accepted in Bhutanese culture. Alcohol is used in every occasion such as religious festivals (including monks), social gathering, welcoming guests, and newborn celebration, bidding good bye, house warming, birthday parties, and almost every occasion of the daily living activities. The day starts with alcohol and end with alcohol and it is most common in the rural areas.

2.1.4.3 Income, education and occupation factors

A study was conducted in China with 15,609 respondents age 15 and above on Socioeconomic status and alcohol use among urban and rural residents to look at income, education, occupation and house size and their drinking habits. The findings was that income was positively associated with the likelihood of current regular alcohol use where as education was negatively associated. For both urban and rural residents, likelihood of

current regular alcohol use was lower in the highest education and lowest income category (Wu et al, 2008)

The effects of alcohol depend on a number of internal and external influences. At the societal level, availability, accessibility, affordability and acceptability have a major influence on alcohol usage. Socio-cultural attributes of peer group influences, the glamour attached to alcohol use and liberalized attitudes of society all have had a major impact on the entry of alcohol and its increasing levels of use, in society.

Increased production of alcohol beverages lead to increased availability in the market with decreased in price and makes easy access to all segments of population including children and women. Further tradition, culture, income, low or no education and occupation create favorable condition for drinking in women in Bhutan.

2.2 Pregnancy and alcohol

According to Centre for Disease Control and Prevention, alcohol use levels prior to pregnancy are a strong predictor of alcohol use during pregnancy. Drinking alcohol beverages during pregnancy is harmful to the fetus (Konovalov et al, 1997) and there is no safe amount or time for drinking during pregnancy (Carson et al., 2010). A woman who is pregnant or planning to become pregnant, abstaining from drinking alcohol is the best advice as per the experts (Ministry of Health, New Zealand 2010). Studies have shown that fetus exposed to alcohol during pregnancy are at risk to Fetal Alcohol Spectrum Disorders (FASD), a general term used to describe the range of effects that can occur in an individual who was exposed to alcohol in utero (Nayak et al, 2011; Green, J.H., 2007). Diagnostic terms of FASDs are Fetal Alcohol Syndrome (FAS), alcohol related birth defects (ARBD) and alcohol related neuro-developmental disorder (ARND). The effect includes physical, mental, behavioral and learning disabilities with lifelong

implications (CDC, 2010). Alcohol consumption during pregnancy has 33% of likelihood of placental abruption leading to miscarriage.

Some experts articulate that not all the fetus exposed to alcohol suffers from Fetal Alcohol Spectrum Disorders (FASD). The incidences of FAS and FASD have been estimated to be 0.97 and 10 per 1000 births respectively (Gifford et al., 2010). However, FASD is preventable disorders if the pregnant mother abstain from drinking alcohol during pregnancy according to an International nonprofit organization on FASD based in Washington DC (NOFAS, 2004).

2.2.1 Pregnant women's knowledge and attitude towards drinking

A qualitative study conducted in 20 pregnant women in UK found out that information and advice about safe levels of drinking during pregnancy is not very clear. Some women considered that there are risks involved in drinking in pregnancy however only six women reported abstinence. Women reported influenced by their family and friends advices and their experiences of previous pregnancies. Pregnant women wished to take responsibilities of their own health provided there is clear and consistent advice (Raymond et al 2009).

Regarding knowledge and attitude towards drinking, 439 Danish speaking pregnant women who came to visit ANC clinic for the first time at 15 – 16 weeks of gestation were interviewed about their attitude towards and beliefs and knowledge about drinking during pregnancy. Questions were also asked about information on alcohol provided to the women. 66% of women considered it is ok to consume some alcohol during pregnancy on weekly level. However 85% of women reported binge drinking as harmful. Most of the women had received information on alcohol from mass media or relatives but most believed that information from health personnel to be the best choice during pregnancy. Most of the women had not been informed about alcohol during pregnancy by the health officials. Only 21% were aware of the official recommendation

from the Danish National Board of Health. One third had discussed alcohol with their general practitioner or midwife, but these women had mostly been advised that some alcohol intake was acceptable. (Kesmodel and Schioler, 1998).

Study conducted in 159 pregnant women all of whom drank regularly before pregnancy recognition by Testa and Reifman in 1996 found out that risk perception play a role in drinking behavior among pregnant women and there is relationship between parity and alcohol consumption. Like the result of the study there is negative perception that women who had healthy child during previous pregnancy had lower perceived risk during current pregnancy and also increased drinking in current pregnancy. Such wrong beliefs should be addressed during current pregnancy to reduce drinking among pregnant mothers.

Providing right information to the mothers to abstain from drinking during pregnancy is important as there is no safe level of drinking when the mother is pregnant. Moreover it creates confusion in pregnant mothers with the word “little amount” as revealed in the above studies.

2.3 Antenatal care

2.3.1 Pregnancy

Pregnancy is physiological phenomenon in which a female attaining reproductive maturity bears child after sexual contact with reproductive age male. In most developing countries pregnancies and child birth are accepted as normal events of life. (Mayank. et al. 2001). All pregnant women require very special individualized care from the family and antenatal care services from the health facilities for the healthy outcome of both mother and baby (Gaby & Mary. 1997).

Screening pregnant women for alcohol use has become increasingly important in light of the research showing that even low levels of prenatal alcohol exposure can harm the fetus. The study results will further guide for future research or study related to alcohol consumption in future for the pregnant mothers attending ANC clinic as well as woman who intend to plan for pregnancy. Further, pregnancy is a period of high motivation for change. Every pregnant woman has a strong desire to give birth to a healthy baby (Hildingsson et al, 2002). A pregnancy forces the woman to shift the focus from herself to the expected baby. Studies have shown that it can be easier for a woman to change her habits during pregnancy than other times. The fact that pregnant mother give attention and priority to her unborn baby means that the ANC is ideally suited for providing information and carrying out alcohol related prevention programs.

2.3.2 ANC Services

Antenatal care is a variable strongly associated with improved birth outcomes. Several barriers exist in women seeking prenatal care. Twenty-five percent of women of child bearing age have no public or private insurance (Stanhope and Lancaster, 1995). However the situation in Bhutan is different with all types of health care service free for every Bhutanese population and still antenatal coverage is only 70% as of 2005 as reported by Reproductive Health Program under Department of Public Health, Ministry of Health (Ministry of Health, 2011). One of the barriers could be, many women lack transportation and have to travel great walking distance to seek antenatal services especially in rural settings and upon reaching the clinic it is often crowded with long waiting time (Stanhope and Lancaster, 1995).

In addition to assessing fetus development and general health of a women, community health nurse should address areas such as promoting healthy life-style behaviors such as eating nutritious balanced diet, taking minerals and vitamins supplements, stress management, and reducing risk factors like cessation of smoking, alcohol and drugs and gaining of required body weight should be the core of prenatal care (Stanhope and Lancaster, 1995).

For women in Hawaii a community nursing model of innovative prenatal care is developed addressing themes to guide nurses in monitoring the woman's pregnancy. Theme for first trimester is "Am I really pregnant?" "What does it mean to be pregnant?" What's happening to me and my baby?" Having a status as a pregnant woman". Second trimester theme includes "Staying healthy through self-care" and "Is my baby okay?" Third trimester theme includes "Preparing for labor and birth," Expectation for my baby and myself". Within these model of care essential antenatal screening, education, and counseling to take place while incorporating women's needs within their social context, cultural and environmental context (Stanhope and Lancaster, 1995).

2.3.3 ANC in Bhutan

In 1998 to meet the needs of community reproductive health services in Thimphu, the old Mother and Child Health (MCH) clinic was renamed as Reproductive Health Unit (RHU) with the expansion of maternal and child health services at JDWNRH. The clinic mainly serves the urban and sub-urban areas of Thimphu with majority of the clients attendance from the nearby districts. It also serves as the referral unit for the other districts and the practical training unit for trainees of Royal Institute of Health Sciences. The regular staff consists of one Medical officer, one General Nurse Midwife (GNM), five Auxiliary Nurse Midwife (ANM) who are posted permanently to work in the unit.

The activities of RHU carried out are identified into six major groups:

- Maternal Care
- Child Care
- Family Planning
- Screening for Cervical and Breast Cancer
- Health Education and Counseling
- In-service Training

2.3.3.1 Maternal Care - antenatal care (ANC)

First visit: during the first visit of a woman, after she is confirmed with pregnancy test positive through laboratory urine test, she is registered in the antenatal registered with proper identification and the following activities are carried out:

1) **History Taking**- the history taking includes:

- Menstrual history including the last menstrual period
- Expected date of delivery of current pregnancy
- Obstetrical history- year, pregnancy type, delivery type, place of birth of her previous pregnancies and outcome, etc.
- Past medical illnesses history, previous surgeries (if any), history of tuberculosis, hepatitis positive or not and any others chronic illnesses
- Present medical history such as bowel, bladder, appetite, sleep, nausea, headache, pain, vaginal discharge and bleeding.

2) **General Medical Examination** includes:

- Height, weight, and blood pressure
- Pallor, condition of tongue and teeth, oedema and jaundice
- Heart and lungs, liver, spleen and breast examination

3) **Routine Laboratory Tests includes**: Urine for albumin and sugar, blood for hemoglobin and grouping and Rhesus, and VDRL tests are carried out.

- General abdominal examination to determine height of fundus, presentation and position of the fetus and rhythm of fetal heart rate (FHS)
- Routine tetanus immunization, iron and vitamin supplementation are given
- High risk pregnancies or pregnancies associated with other problems are referred to an Obstetrician, Gynecologist or other specialists accordingly
- First visit are referred to General Medical doctors for heart and lungs examination.

Subsequent visits: subsequent visits are planned as per the period of amenorrhoea on the first visit and associated medical/obstetric and other problems. Women are advised to visit once every month up to 30 weeks of gestation. The visit is arranged every two weeks from 30 – 36 weeks of gestation and after 36 weeks till delivery women are advised to visit ANC check up every week. This schedule of visits is followed in England too (Hall et al. 1980). Therefore at least 10 visits or more to the clinic are expected if the women presents herself to ANC clinic in the first trimester of pregnancy. In European Union, Luxembourg is an exception with average of only five visits, the Netherlands has 12 to 14 visits, Scotland has 14 visits, Finland 15.2, Sweden 16 visits (Villar et al. 1997).

Further the following activities are routinely performed on subsequent visits:

- General examination such as body weight, blood pressure, presence of edema of feet and other problems
- Routine laboratory tests for albumin and sugar in urine, hemoglobin level
- Abdominal palpation for the height of fundus of the uterus, fetus presentation, lie, and fetal heart rate and the rhythm
- Tetanus immunization to mother and vitamins and iron tablets supplementations

2.3.3.2 Brief Report of antenatal (ANC) Clinic for 2010

The ANC unit in 2010 has registered a total of 1560 clients from its catchment area, which is about 11% less than the registered clients of 2009 (1748). However, the total visits for 2010 (7483) is more than 2009, with an average increase of a visits/client from 5.1 visits (2009) to 5.8(2010). The expected change of visit is because of the policy mandating 8 visits/clients (2010) instead of 4 visits. Apart from the ANC services

provided, the JDWNRH catchment clinic staff also provides services to 1107 clients from other health centers in Thimphu and 1931 clients from other districts. Most of the clients were self referred and sought ultra-sonogram services, other reasons for self referral were not obvious from the available clinic data.

2.4 Instrument

Various kinds of instruments are available to screen and detect alcohol drinking in different population groups. Following are some of the instruments used frequently.

2.4.1 TWEAK

TWEAK is a five-item scale developed originally to screen for risk drinking during pregnancy. It is an acronym for the questions below (Russell, 1994).

T - Tolerance - "How many drinks can you *hold*?"

W - **W**orried - "Have close friends or relatives worried or complained about your drinking in the past year?"

E - Eye-opener - "Do you sometimes take a drink in the morning when you first get up?"

A - Amnesia—stands for blackouts—"Has a friend or family member ever told you about things you said or did while you were drinking that you could not remember?"

K - K/Cut Down—"Do you sometimes feel the need to cut down on your drinking?"

Evaluation of the TWEAK has revealed promising result as a screening tool for identifying pregnant women who are at-risk drinkers, defined as those consuming one ounce of alcohol or more daily (Russell et al. 1994). The TWEAK score is based on seven – point scale, two points each for a positive response to either one of the first two

questions and one point for each of the last three questions. A total score of two or more points indicates that the women is likely to have an alcohol problem. (Russell, 1994).

2.4.2 T-ACE

T-ACE – according to national institute of alcohol abuse and alcoholism (NIAAA) some women may voluntarily disclose the extent of their prenatal alcohol consumption. If not, the T-ACE, a four item screening questionnaire based on the CAGE assessment tool, has been demonstrated to be valuable and efficient method for identifying a range of alcohol use.

The T-ACE questioners are:

T - **Tolerance:** How many drinks does it take to make you feel high?

A - Have people **annoyed** you by criticizing your drinking?

C - Have you ever felt you ought to **cut down** on your drinking?

E - **Eye-opener:** Have you ever had a drink first thing in the morning to steady your nerves or get rid of a hangover?

The T-ACE is considered to be positive with a score of two or more. Affirmative answers to the A, C, and E questions are each scored 1 point. A reply of more than two drinks to the T question is scored 2 points (Chang et al. 1998). The T-ACE is used to screen for pregnancy risk drinking, defined here as the consumption of 1 ounce or more of alcohol per day while pregnant. Scores are calculated as follows: a reply of “More than two drinks” to question T is considered a positive response and scores 2 points, and an affirmative answer to question A, C, or E scores one point, respectively. A total score of two or more points on the T-ACE indicates a positive outcome for pregnancy risk drinking. (Sokol et al. 1989).

2.4.3 CAGE

The CAGE questionnaires is short, simple and easy to remember and it is mostly used in the primary care setting. It has been proven effective for detecting a range of alcohol problems. The CAGE can identify alcohol problems over the lifetime. CAGE or SMAST have been tested in other populations (e.g., heavy-drinking males), so they may be less accurate in identifying risk drinking by pregnant women (Bradley et al. 1998). The CAGE questioners are:

C - Have you ever felt you should **cut down** on your drinking?

A - Have people **annoyed** you by criticizing your drinking?

G - Have you ever felt bad or **guilty** about your drinking?

E - **Eye opener***:* Have you ever had a drink first thing in the morning to steady your nerves or to get rid of a hangover?

Two positive responses are considered a positive test and indicate further assessment is warranted.

2.4.4 CRAFFT

CRAFFT screening test is a short, self administered tool for high risk alcohol and other drug use for adolescents. The CRAFFT performs a similar function to the CAGE questionnaires, which is used for screening alcohol use in adults but has poor psychometric properties for adolescents (Knight, 2002).

CRAFFT questionnaires are;

C - Have you ever ridden in **car** driven by someone (including yourself) who was “high” or had been using alcohol or drugs?

R -Do you ever use alcohol or drugs to **relax**, feel better about yourself?

A -Do you ever use alcohol or drugs while you are by yourself, **alone**?

F -Do you ever **forget** things you did while using alcohol or drugs?

F -Do your family or **friends** ever tell you that you should cut down on your drinking or drug use?

T -Have you gotten into **trouble** while you were using alcohol or drugs?

Score two or more "yes" answer suggests a significant problem.

2.4.5 MAST

The Michigan Alcohol Screening Test (MAST) was developed in 1971 and it is one of the oldest and most accurate alcohol screening tests available. Its effectiveness in identifying dependent drinkers is up to 98 percent (Buddy, 2010). The tool was developed to screen alcohol problem in the general population. Twenty two questions of the MAST are used to find out drinking behavior and alcohol related problems. It is particularly useful for identifying alcohol dependence or alcoholism (Reid, 1999). It is used to obtain more qualitative information about a patient's alcohol consumption. (Saunders, 1993)

The questions of the MAST tests focus on problems over the patient's lifetime, rather than on current problems. This means that the tool is less likely to detect alcohol problems in the early stages. The drawbacks of MAST is its lengthy questions which makes inconvenient to administer in a busy hour and in emergency department settings compared to other alcohol screening tools (Buddy, 2010).

2.4.6 AUDIT

The Alcohol Use Disorders Identification Test (AUDIT) was developed by World Health Organization as a screening instrument for hazardous and harmful alcohol consumption. Ten item questionnaire covers the domains of alcohol consumption, drinking behavior and alcohol related problems. AUDIT provides a simple method of early detection of hazardous (or risky) drinking, harmful drinking or alcohol dependence

and it is the first instrument of its type (Saunders, 2006). AUDIT may be useful in screening women and minorities and it has shown promising results when tested in adolescents and young adults but less accurate in older patients.

Questionnaires for AUDIT are as follows;

1. How often do you have a drink containing alcohol?
2. How many drinks containing alcohol do you have on a typical day when you are drinking?
3. How often do you have six or more drinks on one occasion?
4. How often during the last year have you found that you were not able to stop drinking once you had started?
5. How often during the last year have you failed to do what was normally expected from you because of drinking?
6. How often during the last year have you needed a first drink in the morning to get yourself going after a heavy drinking session?
7. How often during the last year have you had a feeling of guilt or remorse after drinking?
8. How often during the last year have you been unable to remember what happened the night before because you had been drinking?
9. Have you or someone else been injured as a result of your drinking?
10. Has a relative or friend or a doctor or another health worker been concerned about your drinking or suggested you cut down?

Scores are as follows; questions 1 to 8 = 0, 1, 2, 3, or 4 points. Questions 9 and 10 are scored 0, 2, or 4 only. A score of 8+ on AUDIT generally indicates harmful or hazardous drinking.

2.4.7 The Rapid Alcohol Problem Screen (RAPS)

The rapid alcohol problem screen (RAPS) is 5 items instrument which when using a cut off value of one point, outperformed all other instruments in all subgroups (Cherpitel 1995). Out of five questions, two are derived from TWEAK, two from AUDIT and one from BMAST. Sensitivity for RAPS for men and women was 93% and 84% respectively and specificity 75% and 82% (Cherpeitel 1995).

2.5 Timeline follow back (TLFB)

The timeline follow back (TLFB) is a method for assessing recent drinking behavior. The tool can be administered by an interviewer, self-administered or administered by computer. The clients are asked to retrospectively estimate their daily alcohol consumption prior to the interview backwards for last 12 months or more. Several memory aids such as calendar, key dates and important occasions are used to help client recall his/her alcohol consumed (Sobell & Sobell, 1992). The main purpose of TLFB is to quantitatively assess pre- and post-intervention of alcohol use in both men and women 14 years of age and older in general population and clinical samples with time requirement of 10-30 minutes. TLFB provides a variety of variables and different estimations of individual consumption levels (Sobell, 1992)

The TLFB have proved to be a psychometrically sound assessment instrument for obtaining retrospective daily estimates of alcohol consumption when administered telephone and computer (Sobell at al.1996).

This study aim to assess any alcohol consumption among pregnant woman coming at ANC clinic for check up therefore, instrument AUDIT is found to be very suitable for this study. More questions will be added to suit the area of interests for the study including reasons for drinking and few questions on “changkey” (rice wine).

2.6 Standard drinks

A standard drink in most countries is measured in terms of pure alcohol (1 ml equals to 0.79grams) which is approximately 8-14grams for one standard drink (Dawson, 2003).

Standard alcohol units (in grams of ethanol) in different countries

Name of the Country	**Standard Drink**
Australia, France, Hungary, Ireland, NZ, Poland, & Spain	10grams
Canada	13.6 grams
Denmark, Italy, South Africa	12 grams
Netherlands	9.9grams
Portugal and USA	14grams
United Kingdom	8 grams

Various countries measurement for one standard drink is different as mentioned in below tables. Standard drink equivalence for each beverages according to NIAAA.

Type of Beverages	**% of Alcohol**	**# of standard drink/s**
Can of beer	5 % Alc	12 oz = 1
		16 oz 1.3
		22 oz = 2
Glass of Malt liqueur	7% Alc	12 oz = 1.5
		16 oz = 2
		22 oz = 2.5
		40 oz = 4.5
Glass of table wine	12% Alc	25 oz = 5
Spirits	40 % Alc	1.5 oz = 1
		16 oz = 11

Alcohol Advisory Council of New Zealand and Australian Government at Department of Health and Aging identified the measurement of standard drink as below.

Type of Alc. Beverages	Volume	% Alcohol	# of Standard drink/s
Can of beer	330 ml	2.5%	0.7
Can of beer	330 ml	4%	1
Can of beer	330ml	5%	1.3
Bottle of beer	750ml	4%	2.4
Bottle of red wine	750ml	14%	8.3
Bottle of white wine	750ml	13%	7.7
Spirits	50ml	37%	1.5
Spirits	1000ml	47%	37
Spirits	750ml	40%	22

2.7 Theories

Alcohol is a powerful psychoactive substance that is widely used and legally available around the world. Alcohol theory has been clubbed with drug abuse and there are various theories on drug abuse and alcohol use. Some of these theories are described in brief in the following:

1. **Perceived Effects of Substance Use- A General Theory:** This theory is described under the broad topic of **'theories on one's relationship to self'**. According to Gene M. Smith alcohol in small amount is perceived as promoting hospitality, enhancing the pleasure of social interaction and reducing unwanted and unpleasant situations. Although many who drink for the first time believes that the benefit of occasional use outweigh its risks, and have mixed attitudes, beliefs and expectations regarding the advantages and disadvantages of alcohol use. This complex feelings generate overall outcome to alcohol use tendency that can range from extremely positive to extremely negative and the more positive, the higher the probability to use and it is likely to begin drinking at earlier age.

2. **The Bad-Habit Theory:** this theory too falls under **'theories on one's relationship to self'** where drug abuse and alcohol consumption by Donald W. Goodwin articulates that alcoholism runs in a family and children born to an alcoholic patents are four times greater risks of becoming alcoholic (West and Prinz, 1987). Genetic factor play very important role in alcohol consumption. Besides this strong evidence of genetic contribution, environment play very important role in alcohol consumption such as alcohol consumption during prenatal period, early childhood, or early or late adolescence. Few such variables are maternal drinking during pregnancy, geographic location, family and community environment, religious involvement, low educational background, and association with deviant peers.

3. **The Social Setting as a Control mechanism in Intoxicant Use** –This theory which is described under the heading **'theories on one's relationship to society'** by Norman E. Zinberg talks about the individual decision to use alcohol, its effect, psychological and social implications of the use. The use of alcohol depends on the physical and social setting in which such use is taken place rather than depending on the pharmaceutical properties of alcohol and the attitudes and personality of the user. However, social sanction defines whether and how it should be used which include both the informal and formal laws and policies regulating the alcohol use. For example "Know your limit" or "Don't drive when you are drunk", these two examples regulate the social alcohol consumption. In many societies information on alcohol is readily available from mass media, cocktail parties, wine at meals, homes broken by drinks, drunks whose life is unsuccessful, social gatherings of families and friends, religious rituals. In addition some culture create favorable condition to drink such as it is ok to drink at the end of day or a can of beer on the way back home from work or drink while watching television relaxing but not in the office (Zinberg et al. 1977).

4. **A Theory of alcohol and drug abuse- A genetic approach;** under the component of **'theory of one's relationship to nature'**, children born to alcoholic parents have increased risks for alcoholism in children even if the children are separated from parents at birth compared to the children of nonalcoholic reared by alcoholic adopted parents (Schuckit et al. 1972; Goodwin et al. 1974). This hypothesis was further strengthened by studies conducted in twins where it was shown that a level of heritability for drinking and drinking problem, as well as higher concordance rate for alcoholism in identical twin than in fraternal twins (Kendler et al, 1992). Many studies have proven that genetic factors play a crucial role in the etiology of alcoholism as there is good evidence from different methodologies in different countries which points to the possible importance of genetics as a contributing factor to alcohol use and the existing information is preliminary and open to interpretation as being consistent with an environmental or social model, or as indicating an influence of genetics.

2.8 Review of other studies

The fetal alcohol syndrome was first described by Kenneth Lyon Jones and David W. Smith in 1973 (CDC, 2007). It is now well established with diagnostic criteria and characteristic facial features including micorcephaly, small palpable fissures, a flat nasal bridge, smooth or indistinct philtrum, a thinned upper lip and flattening of mid-face. Fetal alcohol syndrome generally reflects how alcohol affects the central nervous system and growth of the heart, eyes, legs, arms, ears, teeth and external genitalia (CDC, 2007). Earlier it was believed that only first trimester exposure was primary importance in the risk for fetal alcohol syndrome. However, the recent studies have confirmed alcohol as a teratogen throughout pregnancy on individual basis rather than according to the timing of the exposure or even the quantity of alcohol consumed level as low as one to two drinks per week in the second and third trimester can have negative effects (CDC, 2007).

An article, Alcohol Use during Pregnancy: Prevalence and Impact published in 2007 by Chaya and others deliberates on alcohol consumption by pregnant mothers. It says although alcohol has been categorized as teratogen since the 19th century, alcohol is still consumed by pregnant mothers with rates as high as 20% reported in the National household surveys on Drug Abuse of US Department of Health Human Service in 1994. It was French pediatrician Paul Lemoine in 1967 who characterized alcohol as teratogen and Seattle-based pediatrician Kenneth Lyon Jones (a dysmorphologist) who published the 1973 Lancet article that point the term fetal alcohol syndrome. By 1996, a range of other conditions including alcohol related birth disorder and alcohol related neuro - developmental disorder associated with alcohol use in pregnancy was identified (Chaya et al., 2007).

Women have decreased metabolism of alcohol due to less alcohol dehydrogenises in their gastric mucosa. Therefore, end-organ affects of alcohol are more rapid in women compared to men. In pregnant mother, alcohol can precipitate preterm labor and consumption during first trimester may increase the risk of spontaneous abortion by as much as four folds (Rasch, 2003). Alcohol can cross the placenta into fetal-maternal compartments, the fetus is exposed longer than the mother to the same amount of alcohol as the fetus has less alcohol hydrogenise to metabolize the alcohol than the mother (Rasch, 2003).

Study has been conducted by Cheng et al in 2011 in Baltimore to see the prevalence of prenatal alcohol consumption and the extent of provider screening and discussion about alcohol use during pregnancy where 12,611 mothers who delivered live infants during 2001 – 2008 participated the study. Nearly 8% (95% confident interval 7.1-8.4) of mothers reported alcohol consumption during the last three months of pregnancy. Non-Hispanic white consume more (10.9%, confidence interval 9.8 – 11.9), and older the mother is higher the alcohol consumption is as the study shows aged 35 years or older consumed 13.4 % (confidence interval 12.4 – 14.4). 19% (confidence interval 17.6-21.0) of mothers reported that their prenatal care giver did not ask whether

they were drinking alcohol beverages and 30% (confidence interval 28.3 – 30.8) reported that a health care giver did not counsel them about the consequences of alcohol use on their unborn child. Despite high rate of women drinking health care providers still lack to assess alcohol consumption routinely for pregnant mothers (Cheng et al, 2011).

Study on consumption of alcoholic beverages among pregnant urban Ugandan women was conducted in 2006 by Mamagembe et al to examine alcohol consumption among Ugandan women prior to and after learning of pregnancy. Study consists of 610 women attending antenatal care at the national referral hospital in Kampala, Uganda. 30% of respondents drank alcohol at least monthly before they knew they were pregnant. Among these women almost one-third reported usual consumption of binge drinking. Over all 25% consumed after learning they were pregnant. Commercial beverage, particularly beer were consumed more often compared to traditional drinks. A two-stage screening algorithm asking women about their religion, male partner or friends' drinking, and any lifetime drinking predicted self-reported consumption of alcohol during pregnancy with 97% sensitivity and 89% specificity (Mamagembe et al, 2010).

Eliminating alcohol use during pregnancy substantially reduces the risk of preterm delivery (Sokol and others, 2007). A study was conducted in three thousand one hundred and thirty women where pregnant mothers were followed prospectively for antenatal substance use with untrasound confirmed pregnancy dating. The result showed that alcohol and cocaine but not cigarette use, were associated with increased risk of preterm delivery after control for potential confounders. For every unit increase in alcohol exposure, risk of extreme preterm delivery increased significantly (odds ratio [OR] 34.8). Abstinence of alcohol use while continuing use of cocaine and tobacco was related to a decrease in extreme prematurity by 41%.

Maternal alcohol use before and during pregnancy among women in Taranaki in New Zealand a study was conducted by Ho and Jacquemard in 100 post natal mothers from 21st May to 22nd June 2006 to see alcohol consumption and drinking patterns before

and during pregnancy. It was found out that 80% of women drinking alcohol before pregnancy and 66% binge drinking. Out of these 28% of women continued drinking alcohol throughout pregnancy. 10% were drinking more than 2 units per typical day and more than 7 units per week during pregnancy. Although majority of women stop drinking during pregnancy still more than a quarter still continue to drink during pregnancy (Ho & Jacquemard, 2009).

Study in Australian women on prevalence and predictors of alcohol use in pregnancy and breastfeeding 29% of women who were pregnant in the past 12 months consume alcohol. Data were used from a large representative sample of Australian women drawn from the 2007 National Drug Strategy Household survey. 43% of women who were breast feeding in the past 12 months reported alcohol consumption. Women who were both pregnant and breast feeding in the past 12 months alcohol consumption was 36%. However, most women (95%) reported a reduction in the quantity of their alcohol use while pregnant or breastfeeding. Women who were older age was significantly associated with alcohol consumption during pregnancy and also while breastfeeding. Women whose educational background were higher and breastfeeding for more weeks in the past 12 months were significantly associated with alcohol consumption while breastfeeding, after controlling for confounding psychosocial factors. The study concluded that despite uniform international government guideline recommending no alcohol should be consumed during pregnancy and lactation period, a higher proportion of sample is being reported consuming alcohol during prenatal and postnatal period. Therefore, public health education campaign about the risk of alcohol during these periods is necessary (Maloney et al, 2011).

The Study titled “cigarette, alcohol, and caffeine consumption: risk factors for spontaneous abortion” was conducted by Rasch, V. in 2003. The objective was to study the association between cigarette, alcohol and caffeine consumption and the occurrence of spontaneous abortion. A case control design was used where 330 women with spontaneous abortion in gestational week 6-16 weeks participated the study. The

variables studied were age, parity, occupational situation, cigarette, alcohol and caffeine consumption using logistic regression analysis while controlling for confounding variables. The adjusted OR among women who consumed 5 units or more alcohol per week or 375mg were 4.84 (2.87 – 8.16). So the conclusion is consumption of five or more units of alcohol per week during pregnancy increase the risk of spontaneous abortion (Rasch, 2003).

Another similar study was conducted by Freire and friends on factors associated to alcohol and smoking use in pregnancy. The purpose of the study was to describe alcohol and tobacco use in adult pregnant women and determine its association with the obstetric outcome. Data was collected from 433 women during delivery and puerperium through an interview and inspection of the medical records. It was observed that 5.5 and 7.7% of the pregnant women reported cigarette smoking and alcohol use during gestation, respectively. Maternal features related to tobacco use during pregnancy were marital status ($p=0.005$), age ($p=0.01$) and pre-natal nutritional guidance ($p=0.003$). Tobacco use during pregnancy has been strongly associated with alcohol use, 31.3% of the women reporting simultaneous use of both substances ($p<0.05$). No association between alcohol or tobacco use during gestation and obstetric outcome (gestational age, newborn weight at birth and newborn medical conditions; $p>0.05$) has been detected. The study suggested that tobacco and alcohol use should be investigated during pre-natal care among all women, particularly single women, over 35 years old, with history of miscarriage, and with unwanted pregnancy. Nutritional guidance had a protective effect against tobacco use during gestation, and thus pregnant women should be informed as to the harmful effects of alcohol consumption and smoking to ensure better obstetric outcome (Freire et al, 2009).

CDC analyzed 1991-2005 data from Behavioral Risk Factor Surveillance System (BRFSS) surveys to examine the prevalence of any alcohol use and binge drinking among pregnant women and nonpregnant women of childbearing age in the United States. It was found out that the highest percentages of pregnant women reporting any alcohol use were between aged 35-44 years (17.7%), college graduates (14.4%),

employed (13.7%), and unmarried (13.4%). The prevalence of any alcohol use and binge drinking among pregnant and nonpregnant women of childbearing age did not change substantially from 1991 to 2005. The study recommended that the health-care providers should ask women of childbearing age about alcohol use routinely and inform them of the risks from drinking alcohol while pregnant, and advise them not to drink alcohol while pregnant or if they might become pregnant (CDC, 2009).

Study conducted in 10 hospitals in southern and eastern Taiwan with total of 806 indigenous women who had just given birth were recruited to participate in the study. The main purpose of the study was to examine the rate and factors associated with alcohol consumption before reorganization of their pregnancy as well as the rates and factors associated with continuing alcohol consumption after reorganization of pregnancy. They were interviewed information on their substance use, demographic characteristics, psychological health status, history of physical abuse, and pregnancy history. The factors relating to alcohol consumption and continuing alcohol consumption after the recognition of pregnancy were examined using logistic regression analyses. It was found that 26.6% of indigenous pregnant women drank alcohol at any stage after the recognition of pregnancy, and 52.5% of indigenous pregnant women who drank alcohol before the recognition of pregnancy persisted in drinking alcohol after the recognition of pregnancy. Factors like multiple parities, smoking or chewing betel quid after the recognition of pregnancy, and a higher frequency of drinking alcohol before the recognition of pregnancy were significantly associated with alcohol consumption and continuing alcohol consumption after the recognition of pregnancy. Marital status like being single or divorced, and intimate partner violence after the recognition of pregnancy were significantly associated with alcohol consumption after the recognition of pregnancy. Study suggested that early detection of alcohol consumption and effective intervention for alcohol consumption during pregnancy are needed (Yen, 2011).

Three studies were conducted from 1989 through 2004 in 5 hospitals in western Washington to examine trends in rates of self-reported pregnancy–related alcohol use by

demographic category among women (n=12,526) and also to examine maternal characteristics that are associated with pre-pregnancy alcohol use in the most recent study (2002-2004). First study was conducted from March 1989 through April 1991 with 7178 women, second study from July 1991 through December 1992 with 2230 women and third from June 2002 through March 2004 with 3124 women. Most women in all the three studies were between the age group of 21-30 years with average children of two and mostly non-smokers. Racial composition was similar throughout the studies: white (60-70%), black (11-18%), Asian (8-10%), and Native American and Hispanic (each approximately 3-5%). Over the 15-year span of the 3 studies, it was observed little change in self-report of alcohol use in the month before pregnancy. Logistic regression analyses by race showed statistically significant increases in rates of binge drinking for all but the Native American women. Native American women reported the highest rates, but these did not change significantly over time (28%, 32%, 26% for the 3 studies). A substantial decrease was observed in self-report of any alcohol use during pregnancy (30%, 23%, and 12%, respectively, for the 3 studies) among almost all categories of age, race, education, marital, parity, and smoking status. Overall, rates of binge alcohol drinking during pregnancy decreased across the studies (3%, 4%, 1%, respectively). Among specific demographic categories, only Native American women showed a substantial and significant decrease (16%, 17%, 3%, respectively; *P*-.005). Compared with nonsmokers, smokers had higher rates of any alcohol and binge alcohol drinking, both in the month before pregnancy and during pregnancy. The odds of binge drinking in the month before pregnancy were 6 times higher for smokers than for nonsmokers.

Analysis of maternal characteristics that are associated with drinking in the month before pregnancy was restricted to study 3 (2002-2004). Women who were more likely to drink any alcohol in the month before pregnancy were 31-35 years old (OR, 1.5; 95% CI, 1.2-1.9), had at least 16 years of education (OR, 2.0; 95% CI, 1.6-2.5), and smoked (OR, 4.3; 95% CI, 3.5-5.4). Factors that were associated significantly with maternal binge drinking in the month before pregnancy were 21-25 years old (OR, 1.6; 95% CI, 1.2-2.3), Native American (OR, 1.9; 95% CI, 1.2-3.1) or black race (OR, 1.5; 95% CI, 1.1-2.2),

and unmarried (OR, 1.4; 95% CI, 1.1- 1.9). Over the study years, although the rates of any alcohol use before pregnancy in western Washington have remained stable (slightly 40%), any alcohol use during pregnancy has decreased from 30% (1989-1991) to 12% in 2002-2004. National rates have decreased similarly (to 10.2% in 2002).

These findings suggest that public health messages about the potential risks to the fetus of maternal drinking during pregnancy have been effective. Most women who drink alcohol quit when they recognize that they are pregnant. Another major study finding is the statistically significant increase in the "month or so before pregnancy" binge drinking rates in the region: 14% in 2002-2004, which is a somewhat higher rate than national binge drinking rates in the preceding month among non-pregnant women (12% in 2002). These high "month or so before pregnancy" drinking rates actually may estimate alcohol use during early gestation, before pregnancy recognition. Women who are heavy drinkers and who are not pregnant may have unexpected, unwanted, and unprotected sexual encounters that result in unintended pregnancy. Women who are not planning a pregnancy or who do not know that they have conceived must have continued drinking (Grant et al, 2009). The study suggests that every pregnant women should be screened for alcohol consumption since there is no safe level of drinking during pregnancy. Those women who are not pregnant and binge drinking should be advised on use of contraceptive to avoid unplanned pregnancy and fetal exposure to alcohol during early weeks of pregnancy.

All child bearing women should be pre-informed and educated before they plan for pregnancy as it becomes difficult to detect drinking problem during pregnancy as reported in the findings of the study titled "women's perspectives on screening for alcohol and drug use in prenatal care". Study was aimed to observe women's potential negative outcome of screening during alcohol and drug use during pregnancy. Twenty semi-structured interviews and two focus groups (n = 38) were conducted with a racially/ethnically diverse sample of low-income pregnant and parenting women using

alcohol and/or drugs in a northern California county. Women expected psychological, social, and legal consequences from being identified, including feelings of maternal failure, judgment by providers, and reports to Child Protective Services. Women did not trust providers to protect them from these consequences and took steps to protect themselves. The study concluded that while screening program is a public health concern, implications of women's physical avoidance of and emotional detachment from prenatal care on pregnancy outcome and missed opportunity for health promoting interventions should be considered (Robert & Nuru, 2010).

The study on pregnant women's alcohol consumption: the predictive utility of intension to drink and pre-pregnancy drinking behavior by Zammit and others focused on two aspects: (1) to examine pregnant women's alcohol consumption across time from pre-pregnancy until childbirth and (2) to explore whether pre-pregnancy drinking and intention to drink predict prenatal alcohol consumption while controlling for relevant demographic variables. 248 mothers who were 17-21 weeks of gestation participated the study by completing questions about demographics, intention to drink alcohol during the subsequent pregnancy, and retrospective measures of pre-pregnancy and early pregnancy consumption. Following that calendars were sent fortnightly to assess daily alcohol consumption until birth. Average alcohol consumption in two weeks in the first weeks of pregnancy was lower than during pre-pregnancy for women who drank both pre-pregnancy and post-pregnancy and consumption continued to decrease between one and eight gestational weeks, particularly following pregnancy confirmation, after which it remained relatively stable. For women who drank after pregnancy confirmation, pre-pregnancy drinking quantity significantly predicted intention to drink. It also predicted alcohol consumption in later pregnancy, after controlling for pre-pregnancy drinking and income. Findings of the study highlight the need to measure alcohol consumption at multiple time points during pregnancy. It also emphasized the need for educating and supporting women to reduce consumption when planning pregnancies, and the usefulness of intention to drink as a predictor of drinking during pregnancy (Zammit et al, 2008)

CHAPTER III

RESEARCH METHODOLOGY

3.1. Research design

A cross sectional study aimed at assessing the maternal alcohol consumption during current pregnancy among women attending ANC clinic at Jigmi Dorji Wangchuk National Referral Hospital (JDWNRH) in the capital city Thimphu.

3.2 Study area

Study was carried out in antenatal care (ANC) clinic at Jigmi Dorji Wangchuk National Referral Hospital in the capital city Thimphu Bhutan.

3.3 Sample population

All the pregnant women who came for the ANC check up for the first time, second and third visit during current pregnancy were taken as a sample for the day starting from 1st June, 2011 till required samples was been obtained.

This clinic was chosen because it is one of the largest clinic in the country with high attendance rate and people from all over the country live in Thimphu for various reasons and utilize the ANC facility to the maximum level. Daily average women visiting ANC in the month of June 2010 was 20 per day and it is estimated that data collection will be completed by one month depending on the attendance of pregnant mothers. Total ANC visit in the month of June, 2010 was 615 and total for the whole year was 1543 pregnant mothers.

3.4 Sample size

Krejcie Morgan Formula was used to estimate sample size:

$$S = \frac{\chi^2 \, NP \, (1-P)}{d^2 \, (N-1) + \chi^2 \, P \, (1 - P)}$$

S= required sample size

χ^2 = table value of chi square for one degree of freedom at the desired level of confidence, which was 3.841 for the .95 confidence level.

N = the given population size

P = the population proportion (assumed to be .50 since this would provide the maximum sample size).

d = the degree of accuracy expressed as a proportion (.05)

$$S = \frac{3.841 \, (800)(0.5)(1-0.5)}{(0.05)^2(800-1) + 3.841 \, (0.5) \, (1-0.5)} = 260$$

Therefore, sample size in the research is 260 calculated from the total attendance of 800 cases of pregnant mothers at ANC for the period of June and July in 2010. Extra 20% (52) was taken to supplement the missing data so the total sample size was 312.

3.5 Sampling technique

All the pregnant mothers who came to ANC clinic for antenatal check up for the first, second and third time during current pregnancy was taken as a sample for the day starting from June 1st till the required sample size was obtained.

Inclusion Criteria - All Bhutanese pregnant women who came to ANC clinic as first, second and third visit for ANC check up during current pregnancy in the month of June 2011.

Exclusion Criteria – All non-pregnant and non-national pregnant women who come to visit ANC clinic were excluded. Pregnant women who came for ANC visit more than three visits gets excluded from the study automatically however they were listed as exclusion criteria.

3.6 Data collection

After getting approval from the Ethical Board of Ministry of Health of Bhutan, permission was sought for data collection from the Medical Director of JDWNRH. Questionnaires was pilot tested in similar ANC clinic in another hospital for three days and necessary changes was made. Than actual data from JDWNRH, ANC was collected from all first, second and third ANC visit pregnant women. First woman was taken as first case for the day and woman was explained the purpose of the study and consent form was signed. Next step face to face interview was taken using structured questionnaires. Cases were not repeated.

3.7 Research instrument

Following are the research tools which was used;

1. Structured questionnaire with standard drink measurement chart
2. AUDIT screening test

Tools

Questionnaire	Developed by researcher based on the literature review and conceptual framework demographic characteristics.
AUDIT	Alcohol Use Disorder Identification Tests questionnaire for screening alcohol use. AUDIT test consists of 10 questions with 4 score for each question. Score 1-7 was classified as low risk drinkers, 8-15 as hazardous drinker, 16-19 had harmful drinker and >20 as alcohol dependent (WHO).

Standard Drink chart was used to guide pregnant woman answer correctly about her alcohol consumption.

3.8 Validity and reliability

For validity of the questionnaires was checked by thesis committee of the College of Public Health and Research Board Members in the Ministry of Health, Bhutan. A structured questionnaire was pilot tested for three consecutive days for pregnant women in similar ANC clinic in another district (Paro District Hospital). Each time necessary editing of the questionnaire was done. Data was estimated and found high reliability with Cronbach alpha .94.

3.9 Data analysis

The data form was reviewed for completion of all questions before discharging the woman during interview and it was be entered at the end of day of interview for minimum or no error. After data entry, researcher cross check for errors before analysis. And then the data was processed using SPSS version 16 statistical software. Data was mostly compared between the first, second and third ANC visit women.

- Descriptive analysis to present several variables of samples such as frequencies, percentage, mean, and standard deviation for demographic characteristics.
- Chi-square test was applied to categorical data to find association between socio-demographic characteristics and maternal alcohol consumption.

3.10 Ethical consideration

The approval was sought from the Research Ethical Board of Health (REBH), in the Ministry of Health, Thimphu Bhutan to conduct the proposed study. Right of the subjected was respected before interviewing therefore consent form was taken after explaining the purpose and benefit of the study. To maintain the confidentiality the participants name was not written on the questionnaire rather ID number was used. Separate room was arranged for interview to maintain the privacy of respondents. Subject was not forced to participate the study if they don’t wish to do so. They were informed that they can drop if they don’t feel comfortable with the questionnaire during interview.

3.11 Benefit of study

- Findings of the study will serve as a baseline data for ANC clinic at JDWNRH Hospital in Thimphu for any future interventions.
- ANC staff can plan for prevention programs on alcohol for pregnant women in future.

CHAPTER IV

FINDINGS

4. Background

This cross-sectional study was carried out at the ANC in Jigme Dorji Wangchuck National Referral Hospital (JDWNRH) in Thimphu in the month of June, 2011. The main objective of the study was to assess the alcohol consumption among the pregnant women attending antenatal (ANC) clinic at JDWNRH hospital. The total number of subjects were 312. Data was collected from three different groups of pregnant women who came to ANC as first, second, and third visit. First visit were those who came for the first time as new case to ANC clinic to avail the service and they usually come during first trimester of their pregnancy. Second visit women were those who came for the second time and they had already been to ANC once before and this group of mothers were usually in second trimester of pregnancy. Third visit women were those who had already been two times to ANC clinic for antenatal checkup and most of them are into third trimester of pregnancy. Each woman was interviewed only once and cases not repeated. Data was analysed mostly comparing these three groups of pregnant women.

4.1 Demographic characteristics

Respondents were grouped into three categories and demographic characteristics are described in numbers and percentages in each category as shown in table 4.1.

First (47.4%), second (37.8%) and third (41.9%) ANC visits women, almost half (42.3%) of the respondents were between the age group of 21-25 years. Maximum age was 40, minimum 17 years and mean age in first ANC visit women was 24.35 and (SD) (3.887), second 26.04 (4.4442) and third 26.34 (4.610). Almost all the women (98.7%) were married and 39.4% were from eastern part of Bhutan, 27.9% from west, 23.1% from south and 9.6% from central part of Bhutan. Majority of the respondents in all first (52.6%) second (49.0%) and third (53.0%) ANC visit groups were housewives, followed

by civil servants as 27.6%, 24.5% and 24.8% respectively; private employees were 11.3%, 16.3% and 12.0% respectively of the visits and rests were all running private business, farmers and self employees on small scale home based industries.

Respondents' monthly income in term of Bhutanese currency Ngultrum (1US$ = 45 Ngultrum), the lowest was set to 3,000 the minimum monthly wage of the daily laborer. However, the majority of the respondent earned between 5,001 – 10,000 Ngultrum in all first, second and third group of women with 41.2%, 35.7% and 35.9% respectively in a month, followed by 1001-15,000 Ngultrum per month with 27.8%, 28.6% and 18.8% with respect to the visits to the ANC and rest earned above 15,000 per month.

Qualifications of the respondents have been divided into various categories such as "never went to school" who were completely illiterate, women who attended "non-formal education" (NFE) who were semi literate and rest attended formal education system of the country. Those who went to formal school were further divided into primary, lower, middle, and higher level according to the schooling system in Bhutan. The annual statistics of Ministry of Education in 2010 recorded 362 Primary schools (Pre-primary to 6^{th} standard), 90 Lower Secondary Schools (Pre-primary to 8^{th} standard), 52 Middle Secondary schools (Pre-primary to 10^{th} standard), and 43 Higher Secondary Schools (Pre-primary to 12^{th} standard). Besides these government schools, there are 98 private schools at all levels from Pre-Primary to Higher secondary levels. 93% women were educated at various standards and only 7.0% of women were never been to school.

Almost all the respondents in all first 92.8%, second 91.8% and third 87.2% group were Buddhists followed by Hinduism (8.3%) and Christianity (1.3%). Majority of the respondents in all three groups were pregnant for the first time (53.8%) in their life followed by second time with 27.9%, third with 12.2%, forth with 5.4% and fifth with only 2 women. All the women had normal deliveries, except for 2 women who had abortion during the first and second trimester.

Table 4.1: Demographic characteristics

Variables	1st Visit n=97 cases (%)	2nd Visit n=98 cases (%)	3rd Visits n=117 cases (%)	Total (%)
Age (Years)				
17-20	16 (16.5)	10 (10.2)	10 (8.5)	36 (11.
21-25	46 (47.4)	37 (37.8)	49 (41.9)	132 (42.3)
26-30	29 (29.9)	35 (35.7)	38 (32.5)	102 (32.7)
31-35	4 (4.1)	14 (14.3)	16 (13.7)	34 (10.
36-40	2 (2.1)	2 (2.0)	4 (3.4)	8 (2.6)
Mean (SD)	24.35(3.8)	26.04 (4.4)	26.34(4.6)	25.63(4.4)
Region				
East	39 (40.2)	44 (44.9)	40 (34.2)	123 (39.4)
West	24 (24.7)	27 (27.6)	36 (30.8)	87 (27.9)
South	22 (22.7)	17 (17.3)	33 (28.2)	72 (23.1)
Central	12 (12.4)	10 (10.2)	8 (6.8)	30 (9.6)
Marital Status				
Single	0 (0)	0 (0)	0 (0)	0(0)
Married	97 (100)	96 (98.0)	115 (98.3)	309 (98.7)
Divorced	0 (0)	1 (1.0)	2 (1.7)	3 (1.0)
Separated	0 (0)	1 (1.0)	0 (0)	1 (0.3)
Widowed	0 (0)	0 (0)	0 (0)	0 (0)
Occupation				
House wife	51 (52.6)	48 (49.0)	62 (53.0)	161 (51.6)
Civil Servant	27 (27.6)	24 (24.5)	29 (24.8)	80 (25.6)
Private employee	11 (11.3)	16 (16.3)	14 (12.0)	41 (13.1)
Business	5 (5.2)	6 (6.1)	8 (6.8)	19 (6.1)
Farmer	2 (2.1)	4 (4.1)	4 (3.4)	10 (3.2)
Self employed	1 (1.0)	0 (0)	0 (0)	1 (0.3)
Monthly Income				
< 3000	3 (3.1)	5 (5.1)	6 (5.1)	14 (4.5)
3,001-5,000	7 (7.2)	9 (9.2)	12 (10.3)	28 (9.0)
5,001 – 10,000	40 (41.2)	35 (35.7)	42 (35.9)	117 (37.5)
10,001-15,000	27 (27.8)	28 (28.6)	22 (18.8)	77 (24.7)
15,001 – 20,000	9 (9.3)	13 (13.3)	13 (11.1)	35 (11.2)
> 20,000	11 (11.3)	8 (8.2)	22 (18.8)	41 (13.1)
Mean	11756	12662	12557	12110

Table 4.1: Demographic characteristics (continued)

Variables	1st Visit n=97 cases (%)	2nd Visit n=98 cases (%)	3rd Visits n=117 cases (%)	Total (%)
Educational Level				
Never been to school	23 (23.7)	16 (16.3)	30 (25.6)	69 (22.1)
Non-formal	8 (8.2)	6 (6.1)	8 (6.8)	22 (7.1)
Primary level	9 (9.3)	15 (15.3)	9 (7.7)	33 (10.6)
Lower secondary	6 (6.2)	6 (6.1)	9 (7.7)	21 (6.7)
Middle secondary	16 (16.5)	19 (19.4)	29 (24.8)	64 (20.5)
Higher secondary	32 (33.0)	26 (26.5)	22 (18.8)	80 (25.6)
Degree and above	3 (3.1)	10 (10.2)	10 (8.5)	23 (7.4)
Religion				
Buddhism	90 (90.8)	90 (91.8)	102 (87.2)	282 (90.4)
Hinduism	6 (6.2)	7 (7.1)	13 (11.1)	26 (8.3)
Others	1 (1.0)	1 (1.0)	2 (1.7)	4 (1.3)
Pregnancies				
One time	63 (64.9)	47 (48.0)	58 (49.6)	168 (53.8)
Two times	19 (19.6)	33 (33.7)	35 (29.9)	87 (27.9)
Three times	14 (14.4)	13 (13.3)	11 (9.4)	38 (12.2)*
Four times	1 (1.0)	5 (5.1)	11 (9.4)	17 (5.4)
*2 (0.6) (abortion)				
Deliveries				
One time	19(19.6)	33 (33.7)	35 (29.9)	87 (27.9)
Two times	13 (13.4)	13 (13.3)	10 (8.5)	36 (11.5)
Three times	1 (1.0)	5 (5.1)	11 (9.4)	17 (5.4)
None	63 (64.9)	47 (48.0)	58 (49.6)	168 (53.8)
Abortion	1 (1.0)	0 (0)	1 (0.9)	2 (0.6)

4.2 Types of alcohol

Nine major types of alcohol consumed in Bhutan were listed for the study. Types of alcohol consumed by all three visits were compared and found similar pattern of consumption in all three groups of ANC visit women.

Out of 312 respondents 203 women drank alcohol in their lifetime. Of the total 203 drinkers 38 women did not drink alcohol beverages in last one year, rest 165 women drank alcohol beverages in last one year prior to current pregnancy. The age of first time alcohol drink in life was asked and it was found out that minimum age was 5 and maximum was 30 with Mean 19.04 and SD 3.745. Of those drinkers, majority (19.7%) of women started to drink at the age of 20. From the total 203 drinkers 184 women (90.6%) started to drink between the age of 15-19 and 9.4% of women started before the age of 15 years.

Changkey was the most common alcohol type consumed by respondents followed by beer, wine, ara, and bangchang. Very few women consumed singchang. Consumption of whiskey, brandy and rum was very minimal (Table 4.2). Consumption rate in last three months (during pregnancy) was 25.3%.

Table 4.2 Type and frequencies of alcohol consumed by pregnant women (n=312)

Type of Alcohol	**Life time n (%) 203 (65.0)**	**One Year n (%) 165 (52.8)**	**Three Months n (%) 79 (25.3)**	**One month n (%) 74 (23.7)**	**One week n (%) 34 (10.9)**
Changkey	170 (54.5)	126 (40.4)	44 (14.1)	36 (11.5)	8 (2.6)
Beer	115 (36.9)	74 (23.7)	43 (13.8)	38 (12.2)	21 (6.7)
Wine	89 (28.5)	68 (21.8)	24 (7.7)	24 (7.7)	10 (3.2)
Ara	99 (31.7)	57 (18.3)	29 (9.3)	26 (8.3)	11 (3.5)
Bangchang	91 (29.2)	53 (17.0)	27 (8.7)	19 (6.1)	4 (1.3)
Singchang	43 (13.8)	21 (6.7)	8 (2.6)	7 (2.2)	2 0.6)
Rum	14 (4.5)	3 (1.0)	0 (0)	0 (0)	0 (0)
Brandy	8 (2.6)	2 (0.6)	1 (0.3)	1 (0.3)	0 (0)
Whiskey	9 (2.9)	0 (0)	0 (0)	0 (0)	0 (0)

4.3 Alcohol consumption

Lifetime (66.7%) and last one year (57.3%) alcohol consumption was slightly high in third ANC women but last three months and one month consumption second ANC visit women was higher (29.6%). First ANC visit women drank more (14.4%) during last one week. One week consumption showed decline in frequencies percentages with increase ANC visits. Alcohol consumption in last one week was very less (6.0) in third visit pregnant women (Table 4.3)

Table 4.3: Alcohol consumption by ANC groups

Variables	**1st ANC visit n=97 cases (%)**	**2nd ANC visit n=98 cases (%)**	**3rd ANC visit n=117 cases (%)**	**Total (%)**
Lifetime				
Yes	64 (66.0)	61 (62.2)	78 (66.7)	209(65.1)
No	33 (34.0)	37 (37.8)	39 (33.3)	109(34.9)
Last one year				
Yes	47 (48.4)	51 (52.0)	67 (57.3)	165(52.9)
No	50(51.5)	47 (48.0)	50 (42.7)	147 (47.1)
Last three months				
Yes	26 (26.8)	29 (29.6)	24 (20.5)	79(25.3)
No	71 (73.2)	69 (70.4)	93 (79.5)	233(74.6)
Last one month				
Yes	24 (24.7)	29 (29.6)	21 (17.9)	74(23.7)
No	73 (75.3)	69 (70.4)	96 (82.1)	238(76.2)
Last one week				
Yes	14 (14. 4)	13 (13.3)	7 (6.0)	34(10.9)
No	83 (85.6)	85 (86.7)	110 (94.0)	278(89.1)

4.4 Alcohol consumption by trimester group

Respondents were categorized into three groups according to their gestational period. One to three months pregnant were grouped as first trimester, four to six months into second trimester and seven and above as third trimester. Table 4.4 elaborates the consumption pattern in lifetime, in last one year, last three months, last one month and last

one week. Alcohol consumption for last three months (during pregnancy) was higher in ***first trimester (30.8%)*** but one month and one week consumption second trimester showed slight increased compared to first and third trimester.

Table 4.4: Alcohol consumption by Trimester groups

Variables	**1st Trimester n=65 cases (%)**	**2nd Trimester n=123 cases (%)**	**3rd Third n=124 cases (%)**	**Total (%)**
Lifetime				
Yes	48 (73.8)	76 (61.8)	79 (63.7)	209(65.1)
No	17 (26.2)	47 (38.2)	45 (36.3)	109(34.9)
Last one year				
Yes	32 (49.2)	64 (52.0)	69 (55.6)	165(52.9)
No	33 (50.8)	59 (48.0)	55 (44.4)	147(47.1)
Last three months				
Yes	20 (30.8)	36 (29.3)	23 (18.5)	79(25.3)
No	47 (69.2)	87 (70.7)	101 (81.5)	233(74.7)
Last one month				
Yes	18 (27.7)	35 (28.5)	21 (16.9)	74(23.7)
No	47 (72.3)	88 (71.5)	103 (83.1)	238(76.2)
Last one week				
Yes	8 (12.3)	21 (17.1)	5 (4.0)	34(10.9)
No	57 (87.7)	102 (82.9)	119 (96.0)	278(89.1)

4.5 Types of alcohol consumed in lifetime

Types of alcohol consumed over the life time by all three visits was compared and in all three categories consumption rate were similar. In all first, second and third ANC visits, Changkey ranked highest in terms of percentage (84.4%), (83.6%) and (83.3%) respectively followed by beer and ara. Bangchang ranked forth followed by wine and singchang (Table 4.5).

Table 4.5: Types of alcohol consumed in lifetime

Variables	1st ANC visit n=64 cases (%)	2nd ANC visit n=61 cases (%)	3rd ANC visit n=78 cases (%)	Total (%) n=312
Changkey				
Yes	54 (84.4)	51 (83.6)	65 (83.3)	170 (54.5)
No	10 (15.6)	10 (16.4)	13 (16.7)	33 (10.6)
Beer				
Yes	42 (65.6)	40 (65.6)	33 (42.3)	115 (36.9)
No	22 (34.4)	21 (34.4)	45 (57.7)	88 (28.2)
Ara				
Yes	37 (57.8)	24 (39.3)	38 (48.7)	99 (31.7)
No	27 (42.2)	37 (60.7)	40 (51.3)	104 (33.3)
Bangchang				
Yes	30 (46.9)	23 (37.7)	38 (48.7)	91 (29.2)
No	34 (53.1)	38 (62.3)	40 (51.3)	112 (35.9)
Wine				
Yes	30 (46.9)	30 (49.2)	29 (37.2)	89 (28.5)
No	34 (53.1)	31 (50.8)	49 (62.8)	114 (36.5)
Singchang				
Yes	12 (18.8)	13 (21.3)	18 (23.1)	43 (13.8)
No	52 (81.3)	48 (78.7)	60 (76.9)	160 (51.3)
Rum				
Yes	5 (7.8)	6 (9.8)	3 (3.8)	14 (4.5)
No	59 (92.2)	55 (90.2)	75 (96.2)	189 (60.6)
Whiskey				
Yes	3 (4.7)	3 (4.9)	3 (3.8)	9 (2.9)
No	61 (95.3)	58 (95.1)	75 (96.2)	194 (62.2)
Brandy				
Yes	2 (3.1)	3 (4.9)	3 (3.8)	8 (2.6)
No	62 (96.9)	58 (95.1)	75 (96.2)	195 (62.5)

4.6: Types of alcohol consumed in last one year

Alcohol consumption in last one year showed that majority of women drank changkey compared to other types of drinks. 48.6% of the first ANC visit women, 29.4% of the second visit women and 61.2% of the third ANC visit women drank changkey. There was increase in consumption in third ANC visit women. Beer ranked second highest with 40.3%, 19.6%, and 26.9% respectively followed by wine, bangchang, and singchang. No one drank whisky but 2 respondents drank brandy and 3 drank rum. Consumption for all types of alcohol was low in second visit ANC women. (Table 4.6)

Table 4.6: Types of alcohol consumed in last one year

Variables	1st ANC visit n=72 cases (%)	2nd ANC visit n=51cases (%)	3rd ANC visit n=67 cases (%)
Changkey			
Yes	35 (48.6)	15 (29.4)	41 (61.2)
No	37 (51.4)	36 (70.6)	26 (38.8)
Beer			
Yes	29 (40.3)	10 (19.6)	18 (26.9)
No	43 (59.7)	41 (80.4)	49 (73.1)
Ara			
Yes	22 (30.6)	5 (9.8)	18 (26.9)
No	50 (69.4)	46 (90.2)	49 (73.1)
Bangchang			
Yes	18 (25.0)	6 (11.8)	21 (31.3)
No	54 (75.0)	45 (88.2)	46 (68.7)
Wine			
Yes	25 (34.7)	10 (19.6)	17 (25.4)
No	47 (90.3)	41 (80.3)	50 (74.6)
Singchang			
Yes	7 (9.7)	2 (3.9)	7 (10.4)
No	65 (58.8)	49 (96.1)	60 (89.6)
Rum			
Yes	2 (2.8)	0 (0.0)	1 (2.0)
No	70 (97.2)	51 (100.0)	66 (98.0)
Whiskey			
Yes	0 (0)	0 (0)	0 (0)
No	72 (100.0)	51 (100.0)	67(100.0)
Brandy			
Yes	0 (0)	1 (2.0)	1 (1.5)
No	72 (100.0)	50 (98.0)	66 (98.5)

4.7: Types of alcohol consumed in last three months

Alcohol consumption in last three months showed that 3rd ANC visit women consumed more Changkey (70.8) and beer consumption was high in 1st visit ANC women. Ara, bangchang and wine was next commonly drank women consumed in last three months. Only 6 women drank singchang and 1 woman drank brandy. No one consumed whisky and rum in last three months. (Table 4.7)

Table 4.7: Types of alcohol consumed in last three months

Variables	**1st ANC visit**	**2nd ANC visit**	**3rd ANC visit**
	n=26 cases (%)	**n=29 cases (%)**	**n=24cases (%)**
Chankey			
Yes	10 (38.5)	16 (55.2)	17 (70.8)
No	16 (61.5)	13 (44.8)	7 (29.2)
Beer			
Yes	20 (76.9)	16 (55.2)	7 (29.2)
No	6(23.1)	13(44.8)	17 (70.8)
Ara			
Yes	12 (46.2)	9 (31.1)	8 (6.8)
No	14 (53.8	20 (68.9)	16 (66.7)
Bangchang			
Yes	8 (30.8)	8 (27.6)	10 (41.7)
No	18 (69.2)	21 (72.4)	14 (58.3)
Wine			
Yes	10 (38.5)	10 (34.5)	4 (16.7)
No	16 (61.5)	19 (65.5)	20 (83.3)
Singchang			
Yes	1 (3.8)	4 (13.8)	2 (8.3)
No	25 (96.2)	25 (86.2)	22 (91.7)
Rum			
Yes	0 (0)	0 (0)	0 (0)
No	26 (100.0)	29 (100.0)	24 (100.0)
Whiskey			
Yes	0 (0)	0 (0)	0 (0)
No	26 (100.0)	29 (100.0)	24 (100.0)
Brandy			
Yes	0 (0)	1 (3.4)	0 (0)
No	26 (100.0)	28 (96.6)	24 (100.0)

4.8: Types of alcohol consumed in last one month

In last one month, beer was the most common drink pregnant women consumed. First ANC visit women still consumed more beer (79.2%) than second (44.8%) and third (28.6%). 2nd visit women consumed more changkey (62.1%) in last one month. 3rd visit women still consumed changkey. Ara, bangchang and wine consumption was still higher but lower compared to changkey and beer. No one consumed whisky, brandy and rum in last one month. (Table 4.8)

Table 4.8: Types of alcohol consumed in last one month

Variables	1st ANC visit n=24 cases (%)	2nd ANC visit n=29 cases (%)	3rd ANC visit n=21 cases (%)
Changkey			
Yes	5 (20.8)	18 (62.1)	12 (57.1)
No	19 (79.2)	11 (37.9)	9 (42.9)
Beer			
Yes	19 (79.2)	13 (44.8)	6 (28.6)
No	5 (20.8)	16 (55.2)	15 (71.4)
Ara			
Yes	9 (37.5)	8 (27.6)	8 (38.1)
No	15 (62.5)	21 (72.4)	13 (61.9)
Bangchang			
Yes	4 (16.7)	7 (24.1)	7 (33.3)
No	20 (83.3)	22 (75.9)	14 (66.7)
Wine			
Yes	9 (37.5)	11 (37.9)	4 (19.0)
No	15 (62.5)	18 (62.1)	17 (81.0)
Singchang			
Yes	1 (4.2)	3 (10.3)	2 (9.5)
No	23 (95.8)	26 (89.7)	19 (90.5)
Brandy			
Yes	0 (0)	0 (0)	0 (0)
No	24 (100.0)	29 (100.0)	21 (100.0)
Rum			
Yes	0 (0)	0 (0)	0 (0)
No	24 (100.0)	29 (100.0)	21 (100.0)

Table 4.8: Types of alcohol consumed in last one month (continue)

Variables	1st ANC visit n=24 cases (%)	2nd ANC visit n=29 cases (%)	3rd ANC visit n=21 cases (%)
Whiskey			
Yes	0 (0)	0 (0)	0 (0)
No	24 (100.0)	29 (100.0)	21 (100.0)

4.9: Type of alcohol consumed in last one week

Fourteen women in first ANC consumed alcohol in last one week, thirteen women in second visit and seven women in third ANC visit. Number of overall alcohol consumption had decreased in all three ANC visit women but beer(85.7%) and wine (42.9%) was the most commonly consumed alcohol in 1st ANC visit women. Consumption of changkey and beer was equal in 2nd ANC visit women with 38.5% each. 3rd ANC visit women consumed beer and ara the most (41.9%). Over all consumption for last one week was higher in 2nd visit ANC women.

Table 4.9: Types of alcohol consumed in last one week

Variables	1st ANC visit n=14 cases (%)	2nd ANC visit n=13 cases (%)	3rd ANC visit n=7 cases (%)
Changkey			
Yes	1 (7.1)	5 (38.5)	2 (28.6)
No	13 (92.9)	8 (61.5)	5 (71.4)
Beer			
Yes	12 (85.7)	5 (38.5)	3 (42.9)
No	2 (14.3)	8 (61.5)	4 (57.1)
Ara			
Yes	5 (35.7)	2 (15.4)	3 (42.9)
No	9 (64.3)	11 (84.6)	4 (57.1)
Wine			
Yes	6 (42.9)	4 (30.8)	0 (0)
No	8 (57.1)	9 (69.2)	7 (100.0)

Table 4.9: Types of alcohol consumed in last one week (continue)

Variables	1st ANC visit n=14 cases (%)	2nd ANC visit n=13 cases (%)	3rd ANC visit n=7 cases (%)
Bangchang			
Yes	1 (7.1)	3 (23.1)	0 (0)
No	13 (92.9)	10 (76.9)	7 (100.0)
Singchang			
Yes	0 (0)	2 (15.4)	0 (0)
No	14 (100.0)	11 (84.6)	7 (100.0)
Brandy			
Yes	0 (0)	0 (0)	0 (0)
No	14 (100.0)	61 (62.2)	7 (100.0)
Whiskey			
Yes	0 (0)	0 (0)	0 (0)
No	14 (100.0)	13 (100.0)	7 (100.0)
Rum			
Yes	0 (0)	0 (0)	0 (0)
No	14 (100.0)	13 (100.0)	7 (100.0)

4.10: Pattern of alcohol consumed in last one month

Pattern of alcohol consumption in last one month in terms of frequencies, quantities and type were assessed. In terms of frequencies women mostly consumed 1-5 days in a month in first (62.5%), second (65.5%) and third (76.1%) ANC visit women.
6-10days in a month was 29.1% for first, 6.8% for second and 19.0% for third visit women. Only one woman in first and one in second visit drank 26-30 days a month or almost every day.

Quantity consumption in terms of standard drink was measured. Women mostly drank 1-5 standards in a month and some consumed 6-10 standard drinks in one month (table 4.10). The highest consumed was by two women in first and third ANC visit who consumed 46-50 standard drinks in a month. For type of alcohol consume please refer table 4.6.

Table 4.10: Alcohol consumption pattern in last one month

Frequency (Days/month)	**1st ANC visit n=24 cases (%)**	**2nd ANC visit n=29 cases (%)**	**3rd ANC visit n=21 cases (%)**
1-5	15 (62.5)	19 (65.5)	16 (76.1)
6-10	7 (29.1)	2 (6.8)	4 (19.0)
11-15	1 (4.2)	2 (6.8)	0 (0)
16-20	0 (0)	4 (13.7)	1 (4.7)
21-25	0 (0)	1 (3.4)	0 (0)
26-30	1 (4.2)	1 (3.4)	0 (0)

Table 4.10: Alcohol consumption pattern in last one month (continued)

Quantity (Drinks/month)	**1st ANC visit n=24 cases (%)**	**2nd ANC visit n=29 cases (%)**	**3rd ANC visit n=21 cases (%)**
1-5	11 (45 (48)	11 (7.9)	10 (47.6)
6-10	8 (33.3)	8 (27.5)	4 (19.0)
11-15	2 (8.3)	2 (6.8)	5 (23.8)
16-20	1 (4.2)	0 (0)	0 (0)
21-25	1 (4.2)	1 (3.4)	1 (4.7)
26-50	1 (4.2)	7 (53.8)	1 (4.7)

4.11: Patten of alcohol consumption in last one week

None of the women consumed for more than four days in a week and the quantity of consumption in terms of standard drinks had not exceeded more than four in last one week.

Table 4.11: Alcohol consumption pattern in last one week

Variables	**1st ANC visit n=14 cases (%)**	**2nd ANC visit n=13 cases (%)**	**3rd ANC visit n=7 cases (%)**
Frequency (Days/week)			
1-2	13 (92.8)	12 (92.3)	6 (85.7)
3-4	1 (7.2)	1 (7.7)	1 (14.3)
Quantity (Standard drinks/week)			
1-2	13 (92.8)	11 (84.6)	6 (85.7)
3-4	1 (7.2)	2 (15.4)	1 (14.3)

4.12: Type of drinkers

Alcohol Use Identification Test (AUDIT) questionnaires was used to screen alcohol consumption level of the respondents. As per the World Health Organization (WHO) guideline, the score was divided in five groups. Score 0 was abstainers, 1 – 7 was low risk drinker, 8 – 15 was hazardous drinker, 16 – 19 was harmful drinker and score 20 and above was grouped as alcohol dependents. Table 4.12 describes Alcohol Use Identification Test (AUDIT) result. Out of 312 respondents 34.9% were lifetime non-drinker, 56.4% were low risk drinkers, 7.4% were hazardous drinkers, 1.0% was harmful drinkers and only 0.3% woman was alcohol dependent.

Table 4.12: Type of drinkers

Lifetime non-drinkers n (%)	**Low Risk Drinker n (%)**	**Hazardous Drinkers n (%)**	**Harmful Drinkers n (%)**	**Alcohol Dependents n (%)**	**Total n cases**
109 (34.9)	176 (56.4)	23 (7.4)	3 (1.0)	1 (0.3)	312

4.13: Types of drinkers and pattern of consumption in last one month

Two hundred and thirty eight women (76.2%) including lifetime non drinker have not consumed any alcohol drink in last one month. Forty nine women (15.7%) consumed 1-5 days in last one month, thirteen (4.2%) consumed 6-10 days in a month. Those who consumed 1-5 days a month, thirty seven women were low risk drinker (21.0%), ten were hazardous drinker (43.5) and two were harmful drinker (66.7). (Table 4.13)

Table 4.13: Alcohol consumption pattern and types of drinkers

Variable	Abstinence	Low Risk Drinker	Hazards Drinkers	Harmful Drinkers	Alcohol Dependents	Total
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
	109 (34.9)	176 (56.4)	23(7.4)	3 (1.0)	1 (0.3)	(312)
Frequency						
Days/month						
Not drink	109(45.6)	121 (68.7)	8 (34.8)	0 (0)	0 (0)	238(76.2)
1-5	0 (0)	37 (21.0)	10 (43.5)	2 (66.7)	0 (0)	49(15.7)
6-10	0 (0)	11 (6.2)	2 (8.7)	0 (0)	0 (0)	13(4.2)
11-15	0 (0)	1 (0.6)	2 (8.7)	0 (0)	0 (0)	3(1.0)
16-20	0 (0)	6 (3.4)	0 (0)	0 (0)	0 (0)	6(1.9)
21-25	0 (0)	0 (0)	0 (0)	1 (33.3)	0 (0)	1(0.3)
26-30	0 (0)	0 (0)	1(4.3)	0 (0)	1 (100.0)	2(0.6)

Variable	Abstinence	Low Risk Drinker	Hazard Drinkers	Harmful Drinkers	Alcohol Dependents	Total
Total Consumption / month	n (%)	n (%) 176 (56.4)	n (%) 23(7.4)	n (%) 3 (1.0)	n (%) 1 (0.3)	n (%) (312)
Not drink	109	121 (68.7)	8 (34.8)	0 (0)	0 (0)	238(76.3)
1-5	(45.6)	23 (13.1)	7 (30.5)	2 (66.8)	0 (0)	32(10.3)
6-10	0 (0)	15 (8.5)	5 (21.7)	0 (0)	0 (0)	20(6.5)
11-15	0 (0)	9 (5.1)	0 (0)	0 (0)	0 (0)	9(2.9)
16-20	0 (0)	1 (0.6)	0 (0)	0 (0)	0 (0)	1(0.3)
21-25	0 (0)	3 (1.7)	1 (4.3)	0 (0)	0 (0)	4(1.3)
26-30	0 (0)	0 (0)	1 (4.3)	0 (0)	0 (0)	1(0.3)
31-35	0 (0)	2 (1.1)	0 (0)	0 (0)	0 (0)	2(0.6)
36-40	0 (0)	1 (0.6)	0 (0)	1 (33.2)	0 (0)	2(0.6)
41-45	0 (0)	1 (0.6)	0 (0)	0 (0)	0 (0)	1(0.3)
46-50	0 (0)	0 (0)	1 (4.3)	0 (0)	1(100.0)	2(0.6)
	0 (0)					
Type						
Changkey	0 (0)	27 (15.3)	7 (30.4)	1 (33.3)	1 (100.0)	36(11.5)
Beer	0 (0)	26 (14.8)	10	1 (33.3)	1 (100.0)	38(12.2)
Ara	0 (0)	18 (10.2)	(43.5)	1 (33.3)	1(100.0)	26(8.3)
Bangchang	0 (0)	15 (8.5)	6 (26.1)	0 (0)	1 (100.0)	19(6.1)
Wine	0 (0)	16 (9.1)	3 (13.0)	1 (33.3)	0 (0)	24(7.7)
Singchang	0 (0)	5 (2.8)	7 (30.4)	0 (0)	1 (100.0)	7(2.2)
Rum	0 (0)	0 (0)	1 (4.3)	0 (0)	0 (0)	0 (0)
Whiskey	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Brandy	0 (0)	0 (0)	0 (0)	1 (33.3)	0 (0)	1 (0.3)
			0 (0)			

4.14: Reasons for alcohol consumption

Reasons for drinking alcohol were divided into five main groups (table 4.14); to "promote sleep and comforts" where women usually drank at night or in the evenings before or after dinner. Second group of women were those who drank willingly with their friends and relatives for social purposes and they said it was their "culture, tradition and customs", while third group of women mentioned that they were encouraged to drink by their mother, mother-in-law or husband. Some also mentioned that their relatives and

neighbors offered them to drink and they were not able to refuse it. Forth group of women were those who believed physical benefits of alcohol. For example, they believed that alcohol consumption increases milk flow after delivery, gives strength, and provides nutrition to both mother and growing fetus. Last group of women were those who had positive psychological feelings towards alcohol and they consumed alcohol to elevate moods and feelings.

Drinking alcohol to promote sleep in first ANC visit women was (7.2%), second (5.1%) and third (6.0%). For culture, tradition and customs, second (15.3%) ANC visit women had lower score than first (21.6%) and third (16.2%) visit. Third visit women had low percentage compared to first and second women for the reason that they were pressurized by husband, mother or mother-in-law. For women who had positive beliefs towards alcohol, their percentages increased with increase in ANC visits for both physical and psychological group of women.

Table 4.14: Reasons for drinking by first, second and third ANC visits women

Variable	**1st Visit n= 97 (%)**	**2nd Visit n= 98 (%)**	**3rd Visit n= 117 (%)**	**Total n=312 (%)**
Abstinence	33 (34.0)	37 (37.8)	39 (33.3)	109 (34.9)
Promote sleep & comforts	7 (7.2)	5 (5.1)	7 (6.0)	19 (6.1)
Culture, tradition & customs	21 (21.6)	15 (15.3)	19 (16.2)	55 (17.6)
Pressured (parents, husband, relatives and friends)	13 (13.4)	14 (14.3)	14 (12.0)	41 (13.1)
Positive believe physical benefits towards alcohol	9 (9.3)	12 (12.2)	13 (11.1)	34 (10.9)
Positive psychological feelings	14 (14.4)	15 (15.3)	25 (21.4)	54 (17.3)

Table 4.15 Reasons for alcohol consumption and AUDIT category

Most common reasons for consuming alcohol in low risk drinkers were due to positive psychological feelings towards alcohol (28.4%) followed by culture and tradition (25.6%) and pressure of parents, husband, relatives and friends (18.8%). Positive physical believes (17.0%) and believe of promoting sleep and comfort (10.2%) was low.

For hazardous drinkers, culture and tradition was 39.1%, pressure by parents, husband, relatives and friends (34.8%), positive psychological feelings (13.0%), and positive physical believes also (13.0%) towards alcohol. (Table 4.15).

Table 4.15 Reasons for alcohol consumption and AUDIT categories

Reasons	**Low Risk Drinker n (%)**	**Hazardous Drinkers n (%)**	**Harmful Drinkers n (%)**	**Alcohol Dependents n (%)**	**Total n (%)**
	176 (56.4)	23 (7.4)	3 (1.0)	1 (0.3)	203 (65.1)
Promote sleep & comfort	18 (10.2)	0 (0)	1 (33.3)	0 (0)	19 (9.3)
Culture & Tradition	45 (25.6)	9 (39.1)	1 (33.3)	0 (0)	55 (27.1)
Pressured (parents, husband, relatives and friends)	33 (18.8)	8 (34.8)	0 (0)	0 (0)	41 (20.2)
Positive physical effects towards alcohol	30 (17.0)	3 (13.0)	1 (33.3)	0 (0)	34 (16.7)
Positive psychological feelings towards alcohol	50 (28.4)	3 (13.0)	0 (0)	1(100.0)	54 (26.6)

4.16 Healthy child

According to the respondents, almost all the women answered that their last born child was healthy and none of the children were physically deformed except for two women who reported that they had an abortion. One respondent was low risk drinker and other was non drinkers. (Table 4.16)

Table 4.16: AUDIT score and number of children

	Lifetime non-drinkers n (%)	**Low Risk Drinker n (%)**	**Hazardous Drinkers n (%)**	**Harmful Drinkers n (%)**	**Alcohol Dependents n (%)**
	109 (34.9)	176 (56.4)	23 (7.4)	3 (1.0)	1 (0.3)
Number of deliveries					
None	80 (64.0)	77 (48.1)	10 (43.5)	1 (33.3)	0 (0)
Abortion	1 (0.8)	1 (0.6)	0 (0)	0 (0)	0 (0)
One	28 (22.4)	50 (31.3)	8 (34.8)	1 (33.3)	0 (0)
Two	11 (8.8)	20 (12.5)	4 (17.4)	1 (33.3)	0 (0)
Three	4 (3.2)	12 (7.5)	1 (4.3)	0 (0)	0 (0)
Four	1 (0.8)	0 (0)	0 (0)	0 (0)	1 (1.0)
Child Age					
1 Year	1 (0.9)	2 (1.1)	0 (0)	0 (0)	0 (0)
2 Years	10 (9.2)	16 (9.1)	3 (13.0)	0 (0)	0 (0)
3 Years	7 (6.4)	24 (13.6)	6 (26.1)	1 (33.3)	0 (0)
4 years	4 (3.7)	11 (6.2)	1 (4.3)	0 (0)	0 (0)
5 Years	5 (4.6)	25 (14.2)	3 (13.0)	0 (0)	0 (0)
> 5 years	6 (5.5)	15 (8.5)	0 (0)	1 (33.3)	1 (100.0)
Healthy Child					
No child	76 (69.7)	83 (47.2)	10 (43.5)	1 (33.3)	0 (0)
Yes	32 (29.4)	92 (52.3)	13 (56.5)	2 (66.7)	1 (100.0)
No	0 (0)	1 (0.6)	0 (0)	0 (0)	0 (0)
Dead	1 (0.9)	0 (0)	0 (0)	0 (0)	0 (0)

4.17 Pregnancy history

First ANC visit women knew that they were pregnant after one month (44.3%) of conceiving and 46.4% of women knew after two months; 8.2% at three months and 1.0% after four months. Second ANC visit women knew that they were pregnant for last two months (27.6%), three months (31.6%) and five months (3.1%). Third ANC visit women knew they had been pregnant for last two (0.9%), three (12.0%), four (18.8%), five (22.2%), six (29.1%) and seven (17.1%) months.

Mostly women in first (61.9%), second (52.0%) and third (37.6%) ANC visit confirmed their pregnancies when they missed their menstruation. Ultrasound was the second highest means for confirming pregnancy in all first (22.7%), second (25.5%), and third (34.2%) ANC visit women. Urine test in the laboratory of hospital was the next method for confirming their pregnancy for three ANC visit women.

Table 4.17: Pregnancy History

Variable	First Visit n= 97 (%)	Second Visit n= 98 (%)	Third Visit n= 117 (%)	Total n=(%) 312
Month/s women knew she was pregnant				
One month	43 (44.3)	0 (0)	0 (0)	43 (13.8)
Two months	45 (46.4)	27 (27.6)	1 (0.9)	73 (23.4)
Three months	8 (8.2)	31 (31.6)	14 (12.0)	53 (17.0)
Four months	1(1.0)	36 (36.7)	22 (18.8)	59 (18.9)
Five months	0 (0)	3 (3.1)	26 (22.2)	29 (9.3)
Six months	0 (0)	1 (1.0)	34 (29.1)	35 (11.2)
Seven months	0 (0)	0 (0)	20 (17.1)	20 (6.4)
How was pregnancy confirmed?				
Urine test	15 (15.5)	20 (20.4)	32 (27.4)	67 (21.5)
Ultra sound	22 (22.7)	25 (25.5)	40 (34.2)	87 (27.9)
Missed period	60 (61.9)	51 (52.0)	44 (37.6)	155 (49.7)
Fetal movement	0 (0)	2 (2.0)	1 (0.9)	3 (1.0)

Variable	First Visit n= 97 (%)	Second Visit n= 98 (%)	Third Visit n= 117 (%)	Total n (%) 312
Months pregnant				
One month	2 (2.1)	0 (0)	0 (0)	2 (0.6)
Two months	1 (1.0)	0 (0)	0 (0)	1 (0.3)
Three months	60 (61.9)	0 (0)	0 (0)	60 (19.2)
Four months	30 (30.9)	20 (20.4)	0 (0)	50 (16.0)
Five months	1 (1.0)	40 (40.8)	4 (3.4)	45 (14.4)
Six months	0 (0)	26 (26.5)	4 (3.3)	30 (9.6)
Seven months	0 (0)	11 (11.2)	27 (23.1)	38 (12.2)
Eight months	3 (3.1)	1 (1.0)	82 (70.1)	86 (27.6)
Pregnancy planned				
Yes	70 (72.2)	79 (80.6)	92 (78.6)	241 (77.2)
No	27 (27.8)	19 (19.4)	25 (21.4)	71 (22.8)

4.18 Number of deliveries

Majority of women in all first (64.9%), second (48.0%) and third 49.6%) ANC visits were pregnant for the first time and they had no history of past delivery. Two women had an abortion out of which, one was a non-drinker and the other, low risk drinker. Women with one living child in first, second and third visits were 19.6%, 33.7% and 29.9% respectively and women with two children were 13.4%, 13.3%, and 8.5% respectively. Three children in Third ANC visit women was 9.4%, second 5.1% and first 1.0%. Only 2 women in third ANC visit had four children.

Table 4.18: Deliveries and children

Variable	1st ANC Visit n= 97 (%)	2nd ANC Visit n= 98 (%)	3rd ANC Visit n= 117 (%)	Total n (%) 312
Number of deliveries				
None	63 (64.9)	47 (48.0)	58 (49.6)	168 (53.8)
Abortion	1 (1.0)	0 (0)	1 (0.9)	2 (0.6)
One	19 (19.6)	33 (33.7)	35 (29.9)	87 (27.9)
Two	13 (13.4)	13 (13.3	10 (8.5	36 (11.5)
Three	1 (1.0)	5 (5.1)	11 (9.4)	17 (5.4)
Four	0 (0	0 (0)	2 (1.7)	2 (0.6)
Child Age				
1 Year	0 (0)	0 (0)	3 (2.6)	3 (1.0)
2 Years	8 (8.2)	12 (12.2)	9 (7.7)	29 (9.3)
3 Years	5 (5.2)	19 (19.4)	14 (12.0)	38 (12.2)
4 years	3 (3.1)	6 (6.1)	7 (6.0)	16 (5.1)
5 Years	14 (14.4)	7 (7.1)	12 (10.3)	33 (10.6)
> 5 years	4 (4.1)	6 (6.1)	13 (11.1)	23 (7.4)
Healthy Child				
No child	64 (66.0)	47 (48.0)	59 (50.4)	170 (54.4)
Yes	33 (34.0)	50 (51.0)	57 (48.7)	140 (44.9)
No	0 (0)	0 (0)	1 (0.9)	1 (0.3)
Dead	0 (0)	1 (1.0)	0 (0)	1 (0.3)

4.19: Information

A question was asked to all the women if they ever heard of any effects of alcohol on fetus if a woman drank alcohol during her pregnancy. 92.0 % responded “yes” and 8.0 % said “no”. Next question was about the source from where the women heard about those effects and multiple answers were allowed to list out. Table 4.19.a presents the sources from where women heard the effects. Television was the highest source with 74.0 % followed by health staff with 49.4% and radio 44.2%. According to the respondents the best way to impart knowledge was through television, radio and health staff (table 4.19.b).

Figure 6: Sources of information women heard on effects of alcohol on fetus

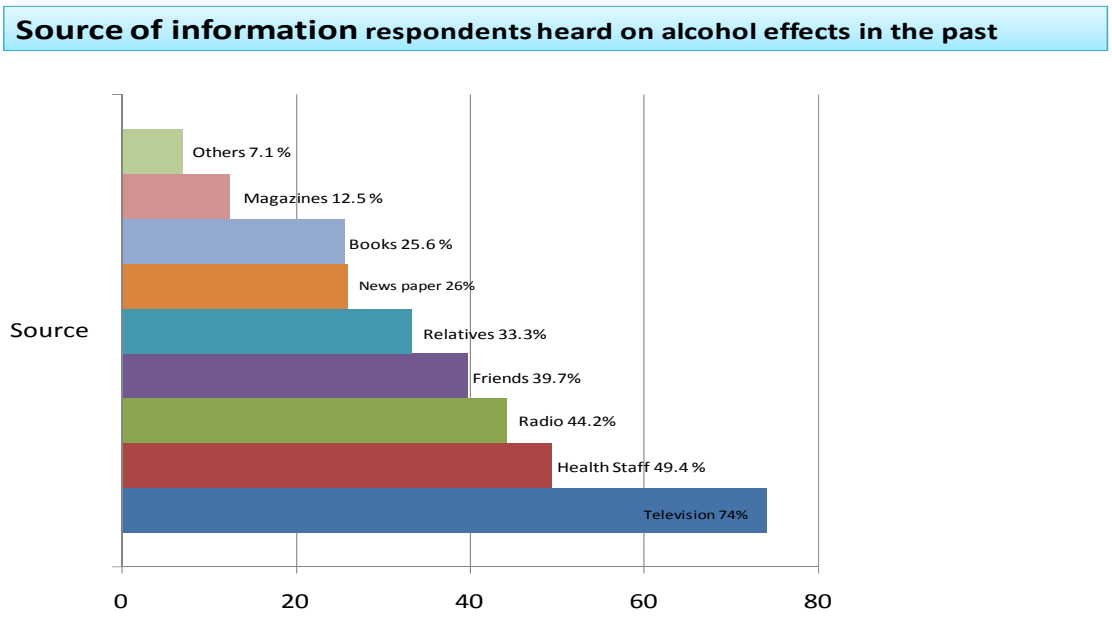
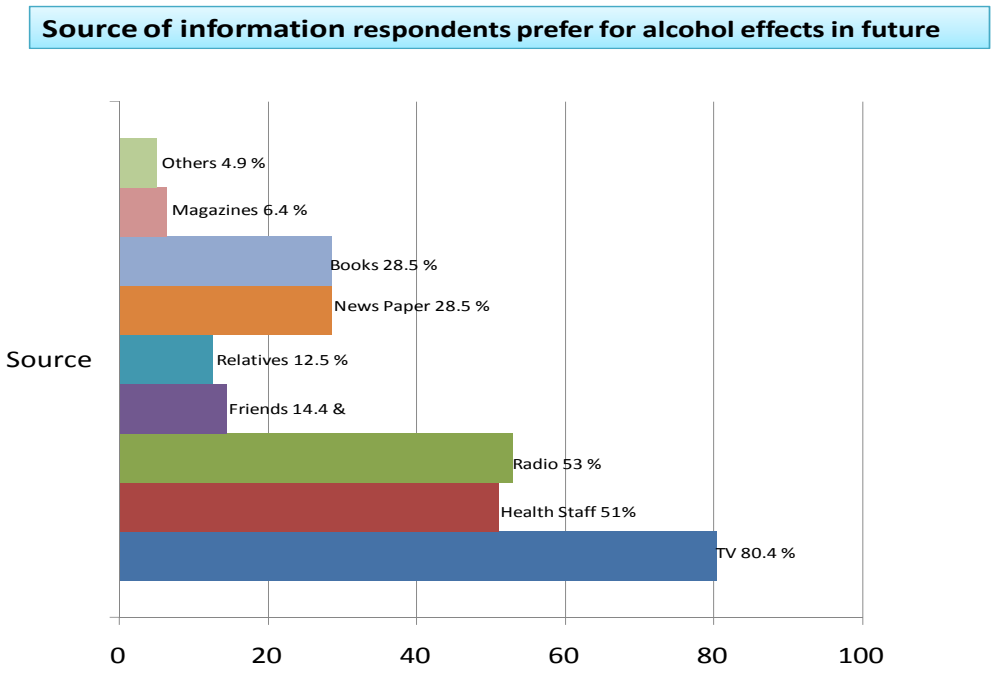


Figure 7: Sources of information women prefer for health education



Respondents were also asked whether a pregnant women should pay attention to her alcohol consumption during pregnancy. Most women (79.5%) agreed that pregnant women should pay attention and positive response rate was even higher (92.3%) for the question: whether alcohol consumption more than five standard drinks on a single occasion were harmful to fetus. Majority (95.8%) of the women did not know that pregnant woman should not consume any alcohol during pregnancy. Only 4.2% answered correctly that pregnant women should not drink alcohol at all during pregnancy.

4.20 Drink preferences

Pregnant women who consumed alcohol preferred homemade alcohol 51.0% more compared to commercial products (22.0%) and some women preferred both (27%). The reason for their preferences was it was not harmful (26.1%), they like it (57.6%) and was cheap and affordable (16.3%).

4.21: Relationship between demographic characteristics and alcohol consumption

Age: Respondents were grouped into three age groups: <25, 26-30 and >30 years old to examine association between age group and alcohol consumption. There was association in lifetime alcohol consumption (p-value 0.001), three months (p-value 0.047) and one week (p-value 0.028) but there was no association in last one year (p-value 0.0.379) and last one month ((p-value 0.053).

Income: there was no association between low income(<10,000/month) and high income (>10,000/month) and alcohol consumption with p-value 0.705 in one year, p-value 0.592 in last three months, p-value 0.507 in last one month and p-value 0.331 in last one week and statistically not significant.

Occupation: pregnant women were divided into two groups (earning and non earning) and alcohol consumption association was assessed and it was found out that there was no association and statistically not significant in last year consumption with p-value 0.670, last three months (p-value 0.816), last one month (p-value 0.875 and last one week (p-value 0.548).

Education of the women was divided into two groups literate and illiterate and association for alcohol consumption in one year, last three months, last one month and last one week was evaluated. There was no association between education level of women and alcohol consumption with statistically not significant at p-value >0.05.

Ethnicity: women were divided into two groups with eastern and central in one group and western and southern in second group this is because eastern and central parts of Bhutan people consume more alcohol. There was association in alcohol consumption in last one week only with statistical significance of p-value 0.048.

Religion: there was no association between Buddhist and other religion and alcohol consumption for lifetime (p-value 0.834), last one year (p-value 0.959), three months (p-value 0.792), one month (p-value 0.615) and one week (p-value 0.162) which is statistically not significant at p-value > 0.05.

4.22 Relationship between pregnancy and alcohol consumption

Following tables describes the association between various variables.

Table 4.22.1 describes that there is no association between first ANC visits and subsequent ANC visits (2^{nd} and 3^{rd}) and alcohol consumption in last 30 days and last one week and it is statistically not significant with p-value >0.05.

Table 4.22.1: ANC visits and last one month alcohol consumption

	First ANC visit n=97 cases (%)	**Subsequent ANC visits** n=215 cases (%)	***p-value***
One Month			0.833
Yes	24 (24.7)	50 (23.3)	
No	73 (75.3)	165 (76.7)	
One week			0.184
Yes	14 (14.4)	20 (9.3)	
No	83 (85.6)	195 (90.7)	

Table 4.22.2 describes the associations between pregnancies in terms of trimesters and alcohol consumption in last one month. Respondents were categorized into two trimesters. First group were women who were pregnant less than three months and second group more than three months. There is no association between months women were pregnant and alcohol consumption in last 30 days and last one week with statistically significance of p-value > 0.05.

Table 4.22.2: Trimester and last one month alcohol consumption

	< Three months n=116 cases (%)	**> Three Months** n=196 cases (%)	***p-value***
One Month			0.929
Yes	28 (24.1)	46 (23.4)	
No	88 (75.9)	150 (76.5)	
One week			0.378
Yes	15 (12.9)	19 (15.0)	
No	101 (87.1)	108 (85.0)	

Table 4.22.3 measures association between number of ANC visits and ***quantity*** of alcohol consumed by the respondents in last 30 days and last one week .There is no association and it is not statistically significant with p-value > 0.05.

4.22.3: ANC visits and ***quantity*** consumed in last one month

	First ANC visit n=24 cases (%)	**Subsequent ANC visit** n=50 cases (%)	***p-value***
			0.409
< 10 standard drinks	19 (79.2)	33 (66.0)	
11-20 standard drinks	3 (12.5)	7 (14.0)	
> 20 standard drinks	2 (8.3)	10 (20.0)	

Drinkers were divided into two groups as low risk drinkers those who scored 1-7 in AUDIT score and high risk drinkers, those who scored more than 8. Table 4.23 describes that there is association between type of drinkers and whether they plan to drink during current pregnancy with statistically significance of p-value < 0.05. There was an association between women who drank during previous pregnancy and plan to drink during current pregnancy with statistically significance of p-value 0.001.

4.22.4: Drinkers and plan to drink during current pregnancy

	Low Risk Drinkers n=176 cases %	**High Risk Drinkers** n = 27 cases %	***p-value***
Plan to drink during current pregnancy			0.013
Yes	71 (40.3)	19 (70.4)	
No	19 (10.8)	1 (3.7)	
Abstainer	86 (48.9)	7 (25.9)	

There was association between number of children women delivered and alcohol consumption in last three months, one month and last one week with statistically significance of p-value < 0.05. Table 4.220.5.

Table 4.22.5: Number of deliveries and alcohol consumption

	≤ One child n = 257 cases %	**≥ Two Children** n = 55 cases %	***p-value***
3 Months drink			0.001
Yes	55 (21.4)	24 (43.6)	
No	202 (78.6)	31 (56.4)	
1 Month drink			0.002
Yes	52 (20.2)	22 (40.0)	
No	205 (20.2)	33 (60.0)	
1 Week drink			0.017
Yes	23 (8.9)	11 (20.0)	
No	234 (91.1)	44 (80.0)	

CHAPTER V

DISCUSSION, CONCLUSION AND RECOMMENDATION

The purpose of this study was to access alcohol consumption among pregnant women attending antenatal clinic at Jigme Dorji Wangchuk National Referal Hospital (JDWNRH) in Thimphu, Bhutan. Structured questionnaires and Alcohol Use Disorder Identification Test (AUDIT) questions were used for face to face interview with 312 pregnant women. Only pregnant women who came to visit ANC clinic for the first, second and third time were included to participate the study.

5.1 Discussion

Alcohol consumption during pregnancy was assessed for lifetime, last one year, three months, one month and one week. Result showed that frequencies of total alcohol consumption decreased when compared between last three months (25.3%), one month (23.7%) and last one week (10.9). However, it is not safe for pregnant woman to consume any amount of alcohol as there is no safe level of alcohol during pregnancy for the fetus (Carson et al., 2010, Grant et all, 2009).

Study revealed that 90.6% of respondents started to drink alcohol between the age group of 15-19 years. 75% of respondents were currently between the age group of 21-30. Therefore, women consume alcohol prior to getting married or soon after getting married and continued to drink alcohol when they were pregnant too.

Moreover alcohol consumption by the respondents in this study in last one year, prior to current pregnancy was 52.9% which was lower than the findings of a study conducted in Korea among pregnant women where alcohol use was 77.0% (So Hee Lee et al, 2010). However, according to Centre for Disease Control and Prevention, alcohol use levels prior to pregnancy are a strong predictor of alcohol use during pregnancy.

In table 4.5 it was revealed that changkey drinking pattern in lifetime for first, second and third ANC were not different but there was increase in consumption with increase of ANC visits in last three months and one month. This findings reports that changkey is the choice of drink for pregnant women throughout their pregnancy.

Beer was the second highest (table 4.5) preference of alcohol for pregnant women. Wine was the third highest and ara which is home brew alcohol was the fourth highest drink of preference women consumed. Ara is considered as hard drink like whiskey, brandy and rum with high alcohol content compared to changkey, bangchang and singchang yet consumption of ara was very high compared to whisky, brandy and rum. Changkey, beer, ara, wine and bangchang were the most popular drink pregnant drank during their current pregnancy (table 4.2).

In the present study, of the total 203 lifetime drinker 38.9% consumed in last three months and 36.4% women consumed alcohol beverages in last one months and 16.7% consumed in last one week. The Behavioral Risk Factor Surveillance System (BRFSS) survey conducted by Center for Disease Control and Prevention in the US found out that, between 1991 and 2005, 12.2% of pregnant women consumed any alcohol in the previous 30 days (CDC, 2009). Alcohol consumption by Bhutanese women was higher compared to respondents of BRFSS study.

According to AUDIT criteria for type of drinkers majority of women 56.4% were low risk drinkers but there is no safe level of alcohol during pregnancy which needs to be addressed by the health staffs during ANC clinics. 20.5% low risk drinkers drank 1-5days in last one month and 6.2% women drank 6-10 days in a month.

Women who consumed alcohol had misconception and they provided various reasons (Refer table 4.14 and 4.15) for drinking alcohol such as to promote sleep and comfort, follow culture, tradition and customs. Women also mentioned that they were encouraged and pressurized by their husbands, mothers and mother-in-laws. Some women felt that alcohol promotes flow of breast milk for baby after delivery especially

changkey and it is healthy drink and gives energy to mother during pregnancy. Alcohol also releases stress and tension, and pain reliever. Some women had positive psychological feelings towards alcohol. Women said little alcohol is good for their health. These negative believes should be addressed clearly. Even a study conducted in Denmark where 439 women participated the study responded that it is alright to drink some amount of alcohol on weekly basis. (Keshmodel and Schioler, 1998).

Only 22.1% of women were neither been to formal school nor non-formal educational which depicts that majority of the women could read and write which is strength for ANC clinic to impart knowledge through leaflets and pamphlets during first ANC visit to prevent fetus from further exposure to maternal alcohol consumption. Moreover one hundred sixty one respondents were housewives (51.6%) followed by eighty civil servant (25.6%) and forty one private employee (13.1%). Majority of women preferred television (80.4%) and over the radio (53.8%) and 51.0% said messages can be disseminated by the health workers. Study by Testa and Reifman in 1996 found out that risk perception play very important role in drinking behavior among pregnant women.
(Testa and Reifman, 1996). This strategy can be adopted by the ANC clinic staffs.

Results also showed that half of the women were pregnant for the first time (53.8%) and if ANC staffs can educate these group of women in their first pregnancy thoroughly than these women would abstain from drinking during their subsequent pregnancies because plan to consume alcohol during pregnancy had positive correlation with alcohol use during previous pregnancy with p value < 0.001.

Majority of the women were Buddhist (90.3%) and are from the eastern (39.4%), western (27.9%) and central (23.0%) part of Bhutan. Rest (9.7%) women who follow Hinduism and Christianity responded that their culture do not permit them to drink alcohol. People from east, west and central follow same religion therefore, messages can also be disseminated by monks and religious personnel.

Ill effects of alcohol on fetus, 92.0% women heard and television (74%) was the most common source of information followed by health staff (49.4%) and radio (44.2%). Rests were all from friends, relatives, newspaper, books and magazines. In contrast women (38.9%) still continued to consumed (table 4.6, 4.7, and 4.8) alcohol during pregnancy.

Many women (79.5%) agreed that a pregnant women should pay attention to her alcohol drinks and 92.3% women said “it is harmful to fetus if woman drink more than 5 alcohol drinks on single occasion” but only 4.2% of women answered correctly that a pregnant woman should ***not consume*** any amount of alcohol when pregnant. As pointed out by some pregnant women one or two drinks was alright for pregnant woman to drink during pregnancy and women had no idea that alcohol is not safe to drink during pregnancy.

5.2 Conclusion

Homemade alcohol “changeky” was consumed by pregnant women throughout their pregnancy with various reasons and believes and the quantity they consume was 1-2 standard drinks per day. Beer was the second choice of drink pregnant women consume followed by homemade “ara” and commercially produced wine. Consumption of beer was high in first visit ANC women. There were only one or two women who drank all brands of alcohol available almost every day.

Lifetime alcohol consumption was two hundred and three women (65.0%) and last one year drink was one hundred and sixty five (52.8%) which was drinking prior to current pregnancy. Out of two hundred and three drinkers, 38.9% of women continued to drink during pregnancy with last three months seventy nine women, last one month seventy four women (36.4%) and last one week thirty four (16.7%) women.

This study found out that 92.0 % responded heard of effects of alcohol on fetus yet drinking rate was high and women continued to drink during pregnancy. The main reason for alcohol consumption was tradition, culture and customs and women had positive feelings towards alcohol especially homemade alcohol. They also drank to promote sleep and comfort.

Intervention based on health behavior, social influence, risk perception, gap between knowledge and misconception may be more successful than traditional educational approach disseminating health education and information to general public and target group population. All pregnant women should be screened and advised on alcohol consumption during pregnancy and this study suggests that there is huge scope for improvement.

5.3 Recommendations

Based on the findings of this study following recommendations are made to various agencies for immediate and long term interventions:

Antenatal Care (ANC) in Jigme Dorji Wanchuck National Referral Hospital (JDWNRH) needs to incorporate alcohol screening instrument and implement it with regular ANC care schedule as early as possible. All pregnant women should be screened at the first contact and educate about the potential risks to the fetus of alcohol use during pregnancy. Informing woman about risk to the fetus may help to reduce alcohol consumption during pregnancy because risk perception is strongly influenced by individuals.

Research Unit in the Ministry of Health to work in collaboration with National Statistical Bureau (NSB) to carry out national household survey on alcohol with special emphasis on *"changkey"* and *"ara"*.

Ministry of Health, Thimphu Bhutan to initiate to work on legislation and policy that pregnant woman and those women planning to become pregnancy to refrain from drinking alcohol. Policy also should address that no alcohol is served to pregnant woman. Strong national policy and clear guidelines, effective prevention program, vigorous public health campaign, must all be in place with regularly updates of scientific evidence based of women's alcohol behavior during pregnancy.

Information Communication Bureau (ICB) under Department of Public Health to develop information and educational material depending on various target population to educate general population on effects of alcohol during pregnancy.

Media can play very crucial role in informing and educating people especially Bhutan Broadcasting Service (BBS), the only national television and radio program in the country. Private media can supplement BBS in educating the general population.

Ministry of Education to develop syllabus on alcohol and pregnancy and incorporate in regular curriculum at various educational levels including non-formal education.

Central Monastic Body can play important role in informing people through religion and health programs.

Apart from the agencies listed above many organizations and agencies both government and non-government can play very important role in curving alcohol consumption problems for pregnant women.

5.4 Limitations

1. Main limitation of this study was that alcohol consumption information were subjective and women may have under reported their alcohol use. To prevent this future studies should combine self report information with other more objectives measures.
2. Samples were collected from ANC clinic therefore; these results do not apply to those pregnant women who do not come to ANC clinic in Thimphu.

3. Time period for data collection was limited to one month (June) only due to academic scheduled program of the college therefore; the results cannot be interpreted for the whole year of the ANC clinic attendance.
4. This study was conducted only in JDWNRH hospital ANC clinic and the results may not apply to general population of the country.

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APPENDICES

APPENDIX A:

QUESTIONAIRE

Questionnaires on Alcohol Consumption among Pregnant Women in ANC at JDWNRH, Thimphu Bhutan

Identification number ☐☐☐

Date of interview……Start time of interview……Finish Time of Interview…….

Following questions are on Social Demographic Characteristics

1. How old are you? Age in years ☐☐
2. What is the name of your home town? …….(name of the district)
3. What is your marital status?

   ☐ Single ☐ Married ☐ Divorced ☐ Separated ☐ Widowed

4. What is your current occupation?

   ☐ House wife ☐ Civil servant ☐ Private employee ☐ Business

   ☐ Farmer ☐ Others (specify)……..

5. What is your monthly income in Ngultrum (Bhutanese currency)?

   Nultrum ……

6. What is your highest education level?

   ☐ Never been to school ☐ Non-formal ☐ Primary level (till 6th standard)

   ☐ Lower secondary level (8th standard) ☐ Middle secondary (10th standard)

   ☐ Higher secondary (12th standard) ☐ Degree or higher

7. What religion do you practice or follow?

☐ Buddhist ☐ Hindu ☐ Others (specify)…….

8. Number of pregnancies including current pregnancy?

☐ One time ***(skip question 10, 11, 27 and 28)*** ☐ Two times ☐ Three times

☐ Four times ☐ Five times ☐ Six or more

9. Number of deliveries? (both live and still born)

☐ None ☐ One time ☐ Two times

☐ Three times ☐ Four times ☐ Five times ☐ Six or more

10. Is your last born child healthy?

☐ No, If "No" any physical or mental deformity..……. ☐ Yes

11. How old is your last born child?

Months ☐☐

. . . . . .

Following questions are on drinking habits in the past, prior to current pregnancy

12. Did you ever drink in your life time?

☐ No ***[if the answer is "NO" jump to question 16]*** ☐ Yes

13. If Yes, age of first time you drank alcohol beverages……Years

14. Drinking habits in the past. [√] Tick appropriate column in the below table.

Sl No.	**Type of Alcohol**	**Life time**		**Last 1 year**	
		Yes	No	Yes	No
1	Whiskey				
2	Brandy				
3	Rum				
4	Beer				
5	Wine				
6	Ara				
7	Bangchang				
8	Singchang				
9	Changkoe (rice wine)				

15. **THE ALCOHOL USE DISORDER IDENTIFICATION TEST (AUDIT)**

Place ***X*** in one box that best describes your answer to each question.						
Questions	**0**	**1**	**2**	**3**	**4**	**Score**
1. How often do you have a drink containing alcohol?	Never	Monthly or less	2-4 times a month	2-3 times a week	4 or more times a week	
2. How many drinks containing alcohol do you have on a typical day when you are drinking?	1 or 2	3 or 4	5 or 6	7 to 9	10 or more	
3. How often do you have six or more drinks on one occasion?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily	
4. How often during the last year have you found that you were not able to stop drinking once you had started?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily	
5. How often during the last year have you failed to do what was normally expected from you because of drinking?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily	
6. How often during the last year have you needed a first drink in the morning to get yourself going after a heavy drinking session?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily	
7. How often during the last year have you had a feeling of guilt or remorse after drinking?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily	
8. How often during the last year have you been unable to remember what happened the night before because you had been drinking?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily	
9. Have you or someone else been injured as a result of your drinking?	No		Yes, but not in last year		Yes, during the last year	
10. Has a relative or friend or a doctor or another health worker been concerned about your drinking or suggested you cut down?	No		Yes, but not in last year		Yes, during the last year	
					Total	

Following questions are on drinking during current pregnancy

16. When did you first know that you were pregnant?

☐ One month ☐ Two months ☐ Three months ☐ Four months

17. How did you know you were pregnant?

☐ Urine test ☐ Ultra sound ☐ Missed period ☐ Fetal movement

18. How many months pregnant are you now?

☐ Less than 3 month ☐ Four months ☐ Five months

☐ Six months ☐ Seven months ☐ Eight months

19. Was your current pregnancy planned?

☐ No ☐ Yes

……

20. Did you consume following alcohol in the last **THREE MONTHS**. [√] Tick appropriate column.

☐ No ***[if the answer is "NO" jump to question number 27]*** ☐ Yes

	Alcohol consumed in the last four months. [√] Tick appropriate column.										
Sl No	**Type of Alcohol**	**February**		**March**		**April**		**May**		Consumption in last **ONE MONTH**	
		No	Yes	No	Yes	No	Yes	No	Yes	Frequency	Quantity
1	Whiskey										
2	Brandy										
3	Rum										
4	Beer										
5	Wine										
6	Ara										
7	Bangchang										
8	Singchang										
9	Changkoe										

21. In the **last three months** when you drank how strong (alcohol) did you prefer to drink?

☐ Mild ☐ Moderate ☐ Strong ☐ Very strong

22. In the **last one month** when you drank how strong (alcohol) did you prefer to drink?

☐ Mild ☐ Moderate ☐ Strong ☐ Very strong

23. Did you consume following alcohol in the last ***ONE WEEK?*** [√] Tick appropriate column.

☐ No ☐ Yes ☐ Not applicable

Sl no	Type of Alcohol	Frequency	Quantity
1	Whiskey		
2	Brandy		
3	Rum		
4	Beer		
5	Wine		
6	Ara		
7	Bangchang		
8	Singchang		
9	Changkoe		

24. Normally when you drink, how strong (alcohol) do you prefer to drink?

☐ Mild ☐ Moderate ☐ Strong ☐ Very strong

25. What type of alcohol mostly do you prefer to drink?

☐ Homemade ☐ Commercial products ☐ Both

26. Why do you prefer the above mentioned alcohol?

☐ Not harmful ☐ I like it ☐ It is cheap ☐ Others……

For the following questions write the exact reasons or statement that woman answers

27. Did you drink during earlier pregnancies?

☐ No, because……

☐ Yes, because……..……

28. Did you drink changkey (rice wine) in your earlier pregnancies?

☐ No, because……..……

☐ Yes, because…….……

29. Do you plan to drink changkey or any alcohol drink during current pregnancy?

☐ No because…….

☐ Yes, because…….

30. Do you normally drink changkey with a meal especially with dinners or before you go to bed?

☐ No because……..……..

☐ Yes, because…….…..

31. Have you ever heard of any effects on pregnancy or the unborn child which are caused by drinking alcohol during pregnancy?

☐ No ***(If "No" skip question 32)*** ☐ Yes

32. From where did you hear the about the birth defects?

☐ Health staff ☐ Radio ☐ Television

☐ Books ☐ News Paper ☐ Magazines

☐ Relatives ☐ Friends ☐ Others…….

33. What do you think is the best way to inform about alcohol in pregnancy?

☐ Health staff ☐ Radio ☐ Television

☐ Pamphlets ☐ News Paper ☐ Magazines

☐ Relatives ☐ Friends ☐ Others (specify)……..

34. Do you personally believe that a woman who is pregnant should pay attention to her alcohol intake?

☐ No ☐ Yes

35. Do you personally believe that it might be harmful for the fetus, if the mother drink more than five drinks on a single occasion?

☐ No ☐ Yes

**********END **********

APPENDIX B

ACTIVITIES SCHEDULE

Activity	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Literature Review	←	—	—	—	→							
Proposal writing					←	—	→					
Review by Board meeting							←	→				
Proposal Exam								↔				
Ethical Clearance								↔				
Data Collection									←	→		
Data entry & analysis										↔		
Report Writing & Presentation											↔	
Printing of Report												↔

APPENDIX C

BUDGET EXPENDITURE

Sl. No	Activity	Unit Cost	Amount in local Currency	Amount in US $
1.	Airfare to go to Bhutan for data collection	Two ways	22,500	750
2.	Purchase of office stationeries and printing of questionnaires	10/set x 400 questionnaires =4000. Pencil and eraser 10 x 50numbers = 500. Notebook 50 x 10 numbers = 500.	5000	166
3.	Refreshment for meeting with ANC staff of hospital	100/head x 50 staffs for 1 days	5000	166
4.	Recruit 1 research assistants	500/day x 30 days	15,000	333
5.	Report binding and printing works		3000	100
		TOTAL	53,500	1188.8

Total approximate expenditure is 1188.8 US Dollar and 35,666Baht. (Conversion rate for 1 US$ equals 30baht)

VITAE

Name: Ms. Pema Udon

Date of Birth: 4th May 1969

Place of Birth: Tashigang, Bhutan

Professional Education

2004-2005	Bachelors Nursing Science, Mahidol University, Thailand
1989-1992	General Nurse Midwife (GNM), Royal Institute of Health Sciences, Thimphu, Bhutan

Professional Experience

2006-2010:	Program Officer, Infection Control and Health Care Waste Management, Department of Medical Service, Ministry of Health, Thimphu, Bhutan.
2001-2003:	Program Officer, Information and Communication Bureau (ICB), Department of Public Health, Ministry of Health, Thimphu, Bhutan
1997-2000:	Asst. Program Officer, Nutrition Program, Department of Public Health, Ministry of Health, Thimphu, Bhutan
1993-1996:	Head Nurse, District Hospital, Pemagatshel, Bhutan
From October 2011:	Lecturer, Royal Institute of Health Sciences (RIHS), Thimphu, Bhutan