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THE RELATIONSHIP BETWEEN KNOWLEDGE OF ALCOHOL EFFECTS ON PREGNANCY AND ALCOHOL USE AMONG A SAMPLE OF URBAN WOMEN

Lehlohonolo Tebogo Chandu

A Research Report submitted to the Faculty of Health Sciences, University of the Witwatersrand, Johannesburg, in partial fulfilment of the requirements for the degree, Master of Public Health

Johannesburg, February 2011

DECLARATION

I, **Lehlohonolo Tebogo Chandu** declare that this research report is my own, unaided work. It is being submitted for the Degree of Master of Public Health in the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in any other University.

_____ [Signature of Candidate]

…28th …… day of ……February… 2011.

DEDICATION

I dedicate this work to:

My Lord and Saviour, my husband and my three sons

ABSTRACT

Alcohol is a major public health problem globally. According to the World Health Organization (WHO) report, alcohol accounts for 2.5 million deaths (4% of total) and 69.4 million (4.5% of total) of Disability-Adjusted Life Years (DALYs), (WHO, 2002, 2011). In South Africa, alcohol was found to be the third highest contributor to death and disability (Parry, 2007/8). Among the many far-reaching consequences of alcohol use in South Africa, Fetal Alcohol Syndrome (FAS) in certain regions in the country, rates among the highest in the world (May et al., 2007). Despite higher comparative levels of FAS in rural areas, almost one third of the population in urban sites (Gauteng) demonstrates that FAS is not exclusively a problem of South African rural areas. This study hypothesized that higher knowledge levels about the effects of alcohol on pregnancy may deter use among women. Employing secondary data analysis from a 2006 cross-sectional household survey, this study explored the prevalence of alcohol use among urban women (18-44 years) in the Tshwane Municipality, in general and in pregnancy. It also examined the relationship between knowledge of alcohol effects on pregnancy and alcohol use. A significant association was found between employment status, pregnancy outcome and general alcohol use among women. An almost significant association was found between knowledge of alcohol effects on pregnancy and past month alcohol use, knowledge levels and alcohol use during pregnancy. Findings partially support the hypothesis. However, knowledge of alcohol effects on pregnancy alone cannot deter women from using alcohol. Multiple influencing factors should be considered in planning prevention programmes for urban women's alcohol use. Further research with larger sample sizes of pregnant women is suggested to explore the associations conclusively.

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I also thank my three sons S'thembiso, S'fezekile and S'thandiweinkosi whom I gave birth to in the period of my study, for all the time you missed being with me.

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ACRONYMS

AEP	Alcohol Exposed Pregnancy
AIDS	Acquired Immune Deficiency Syndrome
AOR	Adjusted Odds Ratio
BAC	Blood Alcohol Concentration
DALYS	Disability-Adjusted Life Years
FARR	Foundation for Alcohol Related Research
FAS	Fetal Alcohol Syndrome
HBM	Health Belief Model
HIV	Human Immuno-deficiency Virus
HREC	Human Research Ethics Committee
MRC	Medical Research Council
NIAAA	National Institute on Alcohol Abuse and Alcoholism
OR	Odds ratio
PAE	Pregnancy Alcohol Exposure
PG	Post Graduate

SES	Socio-Economic Status
WHO	World Health Organization

CHAPTER 1: INTRODUCTION

The purpose of this study was to conduct secondary data analysis on household survey data to describe the prevalence of alcohol use among a sample of urban women (18-44 years) in the Tshwane Municipality in general and during pregnancy. In addition it explored the nature of the relationship between knowledge of alcohol effects on pregnancy and alcohol use in general and in pregnancy.

Background

Alcohol is a major public health problem globally. According to the World Health Organization (WHO) report, alcohol accounts for 2.5 million deaths (4% of total) and 69.4 million (4.5% of total) of Disability-Adjusted Life Years (DALYs), (WHO, 2002, 2011). Approximately two billion people across the world consume alcoholic beverages (WHO, 2011).

Alcohol has played a pivotal role in the history of South Africa. It has been directly linked to the oppression of the black majority by the use of *dop* system -the use of alcohol as part payment for farm worker wages (Parry and Bennetts, 1998). Alcohol has also been linked to the resistance of such oppression (Parry and Bennetts, 1998). The resistance resulted in the proliferation of illegal "shebeens" (Parry et al., 2005). This led to unmonitored drinking patterns and abuse, which still affects the present generations (Setlalentoa, Pisa, Thekisho, Ryke & Loots, 2010). Post the oppression and resistance era, alcohol continued to play a controversial role in society, being hailed on the one hand as stimulating employment for emerging black entrepreneurs, and condemned on the other for causing alcohol attributable diseases and deaths to many and placing an enormous burden on public health in the country (Parry, 2005a).

In South Africa, alcohol was found to be the third highest contributor to death and disability (Parry, 2007/8). Alcohol accounts for (6.5%) total deaths and (6.8%) of total DALYS (Schneider et al., 2007). A high proportion (46%) of mortality cases due to non-natural causes have had blood alcohol levels greater than or equal to the legal limit for driving, that is, 0.05 g/100 ml, (Matzopoulos, Seedat & Cassim, 2003). Research conducted in three large port cities in South Africa in 2001 found that 39% of trauma patients had blood alcohol concentrations greater than or equal to 0.05 g/100 ml (Pluddemann et al., 2003).

It was estimated that 20% of unintentional and 41% of intentional injuries were attributed to alcohol (Schneider et. al., 2007). In addition, to accidents and fatalities, alcohol has been associated with a range of risk behaviors, including, violence and high risk sexual behaviours. Alcohol-related problems also constitute the largest proportion of admissions to specialist substance treatment centres, routinely monitored by the South African Community Epidemiology Network on Drug Use (SACENDU) (Parry et al., 2002).

The burden of alcohol-related risk behaviours is clearly substantial, but does not preclude its effects on health for both men and women differently. Alcohol has been associated with a range of diseases, including, cirrhosis of the liver, cancer, diabetes and cardiovascular disease. However, the consequences on males and females are variable. In almost all instances, men have been disproportionally affected by chronic disease (Rehm et al., 2009). The health consequences for women are unique because of the biological makeup of women. This is because women tend to have lower body weights, smaller livers and higher proportion of fat to muscle. Women also have less water in their bodies than men. The more water available, the more diluted the alcohol (Baraona et al., 2001). Hence, women have higher concentrations of alcohol in their blood than adult men, given the same alcohol intake. Thus, even in small amounts, alcohol affects women differently than men.

In addition to having unique biological risk factors, women have an additional unique factor compared to men, primarily in relation to the opportunity to become pregnant. During pregnancy there is the development of a placenta which, feeds and nourishes the foetus while also disposing of toxic waste. Alcohol is able to pass easily through the placenta from the mother's bloodstream into the blood and tissues of the developing foetus and it is a common teratogen, resulting in birth defects called Fetal Alcohol Syndrome (NIAAA, 2008). FAS is worthy of further investigation and research, particularly regarding the health behaviours of women, given the detrimental effect that it has on a foetus.

CHAPTER 2: LITERATURE REVIEW

Multiple bibliographic databases, including EBSCOhost, PUBMED, WEB OF SCIENCE, Goggle Scholar, were used to develop a comprehensive review of the literature on knowledge of alcohol effects on pregnancy, Fetal Alcohol Syndrome and alcohol use. Selected keywords included *FAS, Health Belief Model (HBM), alcohol use, pregnancy, knowledge, risk and protective factors.*

Fetal Alcohol Syndrome

Fetal Alcohol Syndrome, the most recognized form of Fetal Alcohol Spectrum Disorders is the most severe effect of Alcohol Exposed Pregnancy (AEP) (Morojele et al., 2008). It is a preventable condition which has implications for lifetime physical and mental disabilities. FAS is characterized by particular physical and mental/neurological defects, abnormal facial features, reduced or slowed physical growth, a small head circumference, and slowed intellectual/behavioral development (Morojele et al., 2008). The latter defects are thought to be related to reduced or slowed development of the brain itself (NIAAA, 2008). The brain damage that occurs with FAS can result in lifelong problems with learning, memory, attention, and problem solving (NIAAA, 2008).

These alcohol-related changes in the brain may be present even in babies, whose appearance and growth are not affected. Damage to the nervous system, the brain, and spinal cord can occur in the first few weeks of pregnancy (see figure 1 below); before a woman even knows she is pregnant. Among, other risk factors, Fetal Alcohol Syndrome is associated with episodic binge drinking that produces high blood alcohol concentration (BAC) (May et al., 2008). This is particularly important in South Africa, where binge drinking patterns are relatively high and the patterns of binge drinking among women are not very different from that of men (Parry et. al., 2005). What is regrettable is that FAS is entirely preventable.

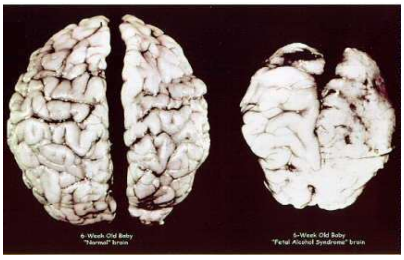
6weeks normal brain  6weeks brain damaged by alcohol

Figure 1: Brain damaged by alcohol (Clarren, 1996)

The preventable nature of FAS notwithstanding, various regions in South Africa have the highest rates of FAS in the world (Urban et al., 2008, May et al., 2000, Viljoen and Craig, 2003). The prevalence rates of 65.2-74.2/1000 (Viljoen et al., 2005) and 68.0-89.2/1000 (May et al., 2007) have been reported from rural communities in the Western Cape. Studies undertaken in Northern Cape and Gauteng province also found high prevalence rates, that is, overall prevalence of 67.2/1000 of FAS between the periods 2001 to 2006. Given the high rates of prevalence, studies are conducted in rural, farm areas, such as (Western Cape and Northern Cape), where *dop s*ystem (which involves the part payment of farm workers in poor quality of wine) used to be practiced. A further study was conducted in non-farming urban area of Gauteng.

In comparison to the Northern Cape region, Gauteng (urban area), had the estimates of median prevalence of FAS amongst first-graders from four schools ranging from 19/1000 to 26.5/1000 (Viljoen and Craig, 2003). Increasingly however, risky drinking has been found to be high among Urban dwellers, (Peltzer & Ramlagan, 2009), indicating that women of child-bearing age in rural areas are not the only ones affected by risky drinking and its associated risks, but that this increasingly applies to urban areas as well. Peltzer & Ramlagan, (2009) reported similar rates in Gauteng of FAS among Grade 1 learners to that of a wine growing region in the Western Cape.

Risks of FAS are associated with low socio-economic status (SES) and lower education attainment, often found largely in rural communities. There are other studies that have reported this association (Urban et al., 2008; May et al., 2005). However, the urban area has protective factors for FAS for instance higher educational levels and better SES. By implication then, women in the urban areas should have higher levels of *knowledge* of the alcohol effects on pregnancy, and hence be at a lower risk for FAS. This study aims to explore this relationship.

Health Belief Model (HBM)

The view that knowledge has a pivotal role to play in determining health behaviours has long been researched by theorists. Knowledge, defined as skills acquired by a person through experience or education, helps in the cognitive process. The present study is informed by the Health Belief Model (Rosenstock, 1966), a psychological model, that attempts to explain and

predict health behaviours. The HBM has four concepts: 1) susceptibility, (2) severity, (3) benefits minus costs and (4) health motive (Rosenstock, 1974) (see figure 2 below).

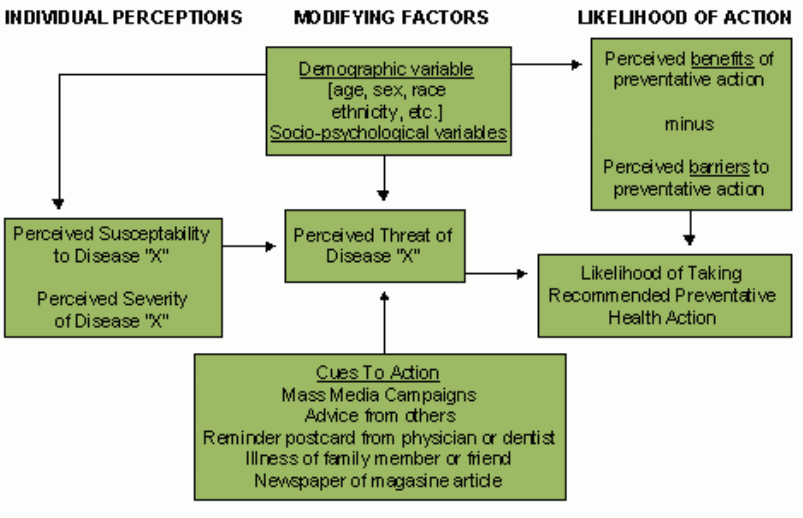


Figure 2: Health Belief Model Diagram (Bowes, 1997)

The model has been used in health education programs for prevention for instance, for safe sex intentions such as abstinence, safer sexual behaviors and condom use. A review paper illustrates that from the 54 studies that measured program impact on condom use, almost half (48%) of them showed increased condom use. According to Iriyama et al., (2007) the HBM has provided a useful conceptual framework for preventing risky sexual behaviors, especially in relation to condom use or reducing number of sexual partners.

As a predictive model of behaviours change, the HBM points to a person's low perceptions of risk as a reason to engage in risky behaviour. Therefore, for the purposes of this study, the researcher will look at the two concepts of the theory, which is susceptibility, i.e. a person believes that his or her health is in jeopardy; (2) severity, i.e. the person perceives the "potential seriousness" of the condition, in terms of pain or discomfort, or that getting the disease has negative consequences. According to a study that was conducted on male adolescent students in Nepal, the perceived severity of HIV/AIDS enhanced intention to abstain from sexual activities (Iriyama et al., 2007)

Applied to this study, the implication is that, for a person to change or avoid risks the person must *know* the consequences of a risky action and understand the perceived threat to the

health of their unborn child. Knowledge is thus seen as a mediating factor in the cognitive process. Hence, according to HBM, the knowledge about the effects of alcohol and perceptions about the risk for the unborn child is a critical factor influencing alcohol related health behaviour during pregnancy.

Khumalo (2008) concurs with the HBM by affirming that being informed (that is, having knowledge) about the effects of alcohol helps individuals make informed, responsible choices regarding drinking. Morojele et al., (2010) also report that knowledge about FAS (OR= 0.37, 95% CI= 0.20-0.70) and education (OR = 0.53, 95% CI= 0.30-0.94) were significant protective factors against alcohol use. According to Rendall-Mkosi et al., (2007) there is a link between a lack of knowledge regarding the detrimental effects of Pregnancy Alcohol Exposure (PAE) on the foetus as a result of possible FAS, and an increased risk of an AEP. This means the lack of knowledge about FAS puts the woman at risk of AEP and subsequently, puts the foetus at risk of FAS. According to Parry (2007/8), lack of knowledge about FAS is one of the risk factors for rural women. It is important to look at the urban area alone, with regard to knowledge about FAS, given the differing SES conditions, against the backdrop of other maternal risk factors such as age, race, education, marital status and reproductive health. These maternal risk factors for FAS have been identified in previous studies (May et al., 2008; Urban et al., 2008). For the purpose of this study only socio-demographic characteristics, knowledge levels, and alcohol use will be addressed.

Maternal Risk factors

Age is one of the socio-demographic characteristics influencing health behavioural change. Previous research investigating the relationship between age and FAS identified advanced maternal age as additional risk factors among women who give birth to children with FAS (Viljoen et al., 2002). According to Chambers et al., (2005) adolescents and younger women may be more likely to drink in pregnancy, but older women who drink heavily in pregnancy are more likely to give birth to a child with FAS (Kvigne et al., 2003). Prenatal alcohol use appears to be the highest in women older than 30 year (May et al., 2008). Therefore, drinking patterns among women based on their ages appear to impact on risk (Parry, 2007/8).

In terms of race, a household survey found that risk predictors of having an alcohol-exposed pregnancy for urban women were, being Coloured or White as opposed to being Black/African (Parry, 2007/8). However, there is trend that Black/African women, especially

adolescents are increasingly using alcohol. A study by Parry, (2005a) confirms that there is an increase in current drinking and in life-time drinking among young, Black/African women. This could be the result of easy access to alcohol in both urban and rural areas or low attainment of education.

Several studies have reported that women with less than high school education are prone to use alcohol while pregnant (Meschke et al., 2008; May et al., 2008; Morojele et al., 2010). This suggests that high education is a protective factor against prenatal alcohol use. On the contrary, a study conducted in the United States (US) showed that a greater percentage of pregnant women with at least some college education (11%) or a college degree or more (14.4%), reported more alcohol use than pregnant women with a high school diploma or less (8.5%) [AORs = 1.4 and 1.9, respectively] (Denny et al., 2009). It is interesting to note that in this cohort, high education increased alcohol use. However, consideration is given to the vastly different socio-economic and cultural contexts of the two studies.

Singleness (unmarried) is also a risk factor for FAS (Meschke et al., 2008; May et al., 2008). Heavy drinking has been seen to be common among women who have never been married, cohabiting, or are divorced or separated (Rendall-Mkosi et al., 2008). The effect of divorce on a woman's later drinking may depend on whether she is already drinking heavily in her marriage. A woman whose husband drinks heavily is also more likely than other women to drink (NIAA, 2008).

Several studies concur with singleness being a risk factor to patterns of alcohol use including a study conducted in the developed country (US). According to Denny et al. (2009), a greater percentage of unmarried pregnant women (3.6%) reported binge drinking than married pregnant women. In South Africa, more married pregnant women reported binge drinking (1.1%, AOR = 4.4%) than single pregnant women (Parry, 2005a). According to Parry (2005a), binge drinking means having five or more drinks on one or more days. Binge drinking is particularly harmful to fetal brain development (Mattison and Riley, 1998). Thus one heavy bout of drinking may be enough to cause FAS (FARR, 2005). This pattern of drinking is common in urban areas. According to Peltzer and Ramalagan, (2009) higher binge drinking levels were found for women (12%) in urban and (9%) in rural. Therefore, it is important that the study looks at patterns of drinking among urban women of childbearing age.

Gravidity and parity are reproduction health indicators that are either risk or protective factors for FAS. Gravidity is defined as the number of times that a woman has been pregnant and parity is defined as the number of times that she has given birth to a foetus with a gestational age of 24 weeks or more, regardless of whether the child was born alive or was stillborn (Borton, 2009). Risk for FAS is associated with higher gravidity and parity. On the other hand, low gravidity and parity were found to be key protective factors for FAS (May et al., 2005).

Understanding what impacts on alcohol use in general and in pregnancy among Urban South African women, requires an exploration of several key factors. In doing so, the relationship between knowledge of alcohol effects on pregnancy, and key socio-demographic factors on the consumption of alcohol among both generally and in pregnancy, will be examined in the following chapters.

Statement of the problem

Despite higher comparative levels of FAS in rural areas, in South Africa, almost one third of the population, in an urban site in Gauteng demonstrates that FAS is not exclusively a problem of rural areas in South Africa. Even though, the women in the urban area are likely to be more educated, there is still prevalence of FAS, (Morojele et al., 2008). While the prevalence of AEP pregnancies and their related conditions have been well established in rural sites, there is limited research on urban areas. The significantly high FAS statistics in South Africa could suggest that a considerable gap exists in the knowledge of effects of alcohol on pregnancy and alcohol use. Thus a study investigating the nature of the relationship between knowledge of effects of alcohol on pregnancy and actual alcohol use during pregnancy is timely.

Aims and Objectives of the study

AIMS

The aim of the study is to explore the relationship between knowledge of alcohol effects on pregnancy and alcohol use generally, and in pregnancy, among urban women (18-44 years) in the Tshwane Municipality during the period 2006.

OBJECTIVES

- To determine the knowledge levels of a sample of women (18-44 years) concerning alcohol effects on pregnancy
- To describe the sample ‘s socio-demographic profile in respect of age, education, race, reproductive health (parity, miscarriage and pregnancy outcome), marital status and socioeconomic status
- To determine prevalence of lifetime and current alcohol use among all women in the sample
- To determine prevalence of alcohol use during pregnancy
- To investigate the association between socio- demographic profile and knowledge levels and alcohol use during pregnancy

CHAPTER 3: METHODOLOGY

This chapter describes the research methodology used to conduct this study. The methods ethical considerations and analytic techniques pertaining to this study are also dealt with in this chapter.

Study sample

Secondary data analysis was conducted on data collected from a cross-sectional household survey undertaken in the Tshwane Municipality, (Gauteng province) during the period 2006. The primary study population consisted of 606 women aged between 18 and 44 years. The entire sample was included in this sub-study. The site, located within Gauteng province had a population estimate of 340,000. The site is highly industrialized and alcohol is widely available through legal and illegal outlets. In proportion to the distribution of demographic groups within the country, as well as that province in the period 2006, Black/African women comprised the major race group in the sample.

As this study employed secondary data analysis, permission to use the data was obtained in writing from the principal investigator and co-principal investigator of the primary study (See Appendix 1). Ethical approval to conduct these analyses was obtained from the HREC (Human Research Ethics Committee-M10105) at the University of the Witwatersrand (see Appendix 3).

In the secondary data analysis, general ethical principles of anonymity were upheld by storing data in the form of case identification, without names or other identifying information. In addition, results are reported as group results, in order to protect any identifying information.

Measures

The following measures were used in the analysis for this study:

Knowledge of alcohol effects on pregnancy: The knowledge variable comprised two components. The first component was a single response question asking “Does the drinking of alcohol during pregnancy have any effect on the unborn foetus? Responses were coded as No (0), Yes/sometimes (1), Do not know (2). The second component of the knowledge variable comprised knowledge about specific alcohol effects in pregnancy. The following subscales were used to measure knowledge about alcohol effects in pregnancy: physical growth, special facial features, speech problems, intelligence ability, learning problem, social integration and behavioural problems. The subscales showed acceptable internal

consistencies, the average of which was 0.89. The knowledge levels were computed as follows: All the missing values of the subscales were counted. The overall score sum was determined by summing up the values of subscales to generate a score between 0 and 7. The overall score average was determined by dividing the sum by 7. The overall score sum was categorised into 3 quartiles (<25%, >25% < 75%, >75%) creating 3 knowledge levels. The knowledge levels of FAS were computed such that the score 1 indicates lower level of knowledge (i.e. less than or equal to two questions) score 2 indicates medium level of knowledge (i.e. three to five questions) and score 3 indicates higher level of knowledge (i.e. six to seven questions).

The acceptable internal consistencies provide support for the rationale of using different domains to measure knowledge about alcohol effects in pregnancy. The knowledge domains were created as follows: Physical setback (1), social setback (2) and mental setback (3). The physical setback includes the following variable: physical growth, special facial features and speech problems. Social setback was comprised of social integration and behavioural problems, and for mental setback, intellectual ability and learning problems was used as variables. The internal consistencies for the three domains were 0.76, 0.70 and 0.75 respectively. This means there is correlation between the variables within the domains. The domains were computed as follows: All the missing values of the physical, social, mental domains were counted. The overall score sum of each domain was determined by summing up the values to generate a score between 0 and 3 for physical setback and score between 0 and 2 for social and mental setback. The overall score average for each domain was determined by dividing the sum by 3 or 2. The overall score sum was categorised into No =0 (if score sum <1) and Yes =1 (if score >=1 & >=3 or >=2).

Socio-demographic profiles: The age variable was re-coded from a numerical variable into a categorical variable to make up the following categories: (18-24 years) (=1), (25-34 years) (=2) and (35-44 years) (=3), based on the fact that younger and older women may face varying physical and social risks. Race was categorized as Black/African (1), Coloured (2), White (3), Asian/Indian (4). Education level was re-coded into three categories: primary (Grade 1-7 & less than year) (=1), Secondary (grade 8-12) (=2) and tertiary (degree, diploma etc.) (=3). Marital status was categorized into married/cohabitation (=1), single/never married (unmarried) (=2) and divorced/widow/separate (not living together with partner) (=3).

Employment status: The employment status was re-coded into three categories: unemployed (0) employed (full-time/ part-time) (1), self-employed (2).

Socio-Economic Status: The socio-economic status (SES) of respondents was assessed by means of an asset indicator. The asset indicator is a crude measure that will be used as a proxy for SES. Previous studies have validated the use of an asset indicator score, as a proxy for SES (Barbarin and Khomo, 1997). For this study, indicator scores were derived from respondents' self-reported answers to a series of questions on their household's ownership of the following eight household assets and commodities: electricity, radio, television, telephone, fridge, computer, washing machine and cell phone. A Cronbach's alpha was conducted to determine the internal reliability, the average was 0.70. Responses were coded as a No (0) or Yes (1) and summed using equal weights to generate a score between 0 and 8. Subsequently, three categories of SES were created. Anyone reporting less than zero and between two possessions was regarded as low socio-economic status (SES) and coded (0). Anyone reporting three to five possessions was regarded as middle socio-economic status (SES) and coded (1). Any one reporting six and more possessions was considered high socio-economic status (SES) and coded (2).

Reproductive history: The reproductive health was categorized into parity, miscarriage and pregnancy outcome. The respondents were categorized as follows: who indicated not given birth was coded (=0), having 1 to 3 children was coded (=1) and indicated low parity, 4 to 6 children coded (=2) indicated middle parity and 7 to 10 children coded (=3) indicated high parity. Miscarriage was categorized into four categories: none (=0), 1 to 4 miscarriage (=1) and 5 or more miscarriage (=2). Pregnancy outcome was coded into five categories: full-term (1), pre-term (2), stillborn (3), voluntarily terminated pregnancy (4) and miscarriage (5).

Alcohol use: The alcohol use measure was divided into lifetime alcohol use (ever had a drink containing alcohol), current alcohol use (past month). The codes for lifetime alcohol measures were subscribed to the standard coding of No (0) and Yes (1). The current alcohol use was coded as not taken any drink in the past month (=0), 1 to 31 days (=1).

Alcohol use during pregnancy: The pregnancy status of the women was categorised into not pregnant (0), pregnant (1) and do not know (2). Last pregnancy status variable was coded: 0 to 1 year (=1), 2 to 5 years (=2) and greater than 5 years (=3). The variable, alcohol use

during pregnancy was computed from the question "after you knew that you were pregnant, how often did you have a drink containing alcohol". The variable was categorised into two categories: never used (0) and used (monthly or less, 2 to 4 times a month, 2 to 3 times a week, 4 or more times a week) (=1).

Pattern of alcohol use pre-pregnancy and during pregnancy: the pattern of alcohol use was classified 3 months before pregnancy (pre-pregnancy) and after the knowledge of pregnancy (during pregnancy). The variables included frequency of use, days on which they drank and number of drinks. Dummy variables were created to show frequency of use before pregnancy: Never (0), monthly (Monthly or less, 2 to 4 times a month) (=1), weekly (2 to 3 times a week) (=2), daily (4 or more times a week) (=3). The variable about the days when alcohol was used were categorised: Never (0), Sometimes (1), weekdays (2), weekends (3) and both (weekdays and weekends) (=4). The amount of drinks was computed and coded as none (0), 1 to 5 drinks (1), 5 to 10 drinks (2) and 10 or more drinks (3). These variable was the computed the same for alcohol use during pregnancy.

Procedure

Following approval by principal and co-principal investigators of the primary study and the institutional ethics committee, the researcher explored the raw data, through descriptive analyses and began extracting required variables to answer the question of the sub-study. Thereafter a code list (see Appendix 2) was compiled. The following dependent and independent variables were identified, and either recoded or computed, as detailed above, to meet the aims and objectives of the study:

Independent variables

Knowledge of alcohol effects on pregnancy, Socio-demographic profile

(Age, race, marital status, education, employment status, SES and reproductive health)

Dependent variables

Lifetime Alcohol use

Current alcohol use

Alcohol use pre-pregnancy and during pregnancy

Data was analyzed using statistical software package STATA (version 11). The variables were re-coded into categorical variables where a number represented a category (e.g. male = (1), female = (2).

Analysis

Univariate analysis was done on both the independent and dependent variables to provide a summary of knowledge of alcohol effects, alcohol prevalence, and alcohol use during pregnancy. Simple frequencies were used to calculate the frequencies of each of the socio-demographic characteristics.

Bi-variate analysis was conducted to show relationship between two variables (Knowledge and alcohol use, AND socio-demographic profile and alcohol use). Pearson chi-squared test (χ^2 test) was used to determine the relationship (association) between two categorical variables (socio-demographic variables and alcohol consumption). Fischer exact test was used for variables that had an expected frequency of five or less. The odds ratios were used to determine the strength of the association. The statistical significance was calculated at 95% confidence interval.

CHAPTER 4: RESULTS

This chapter contains the results from univariate analysis by describing the frequencies of socio-demographic characteristics, knowledge about FAS, and alcohol use in general and during pregnancy, by a sample of urban women. Thereafter bivariate analysis was conducted using the Pearson chi-squared and Fischer exact test to determine the relationship between socio-demographic variables, knowledge about FAS, current use and use of alcohol during pregnancy.

Socio-demographic profile

Table 1 below shows that (30%) of the women in the sample, were in age group 18-24 years (young adults), (38%) in age group of 25-34 years (adults), and (32%) in the age group of 35-44 years (older adults). These age groups are based on the fact that younger and older women may face varying physical and social risks. The majority of women were Black/African (81%), in keeping with the racial distribution of Tshwane municipality in 2006. Eleven percent were Coloured and (7%) were White. There was only one Indian woman in the study sample, and were excluded from further analysis. In terms of educational level, (8%) of the women in the study had primary education, while the majority (78%) had secondary education (grade 8-12). The remaining (14%) had tertiary education.

In terms of marital status, (36%) of the women reported that they were married (either legally, traditionally or cohabiting). Fifty nine percent were unmarried, (either single or never married). The remaining (5%) of the women indicated that they were either separate or divorced (and not living with their partners).

Fifty eight percent of the sample was unemployed, while (40%) were employed either in part-time or full-time employment; and (2%) were self employed. In terms of SES levels (47%) of the women in the sample had higher SES level (more than 6 items), (36%) of the women had medium SES level and (15%) had lower SES level. Two percent was missing values.

In terms of reproductive health (comprised of parity, miscarriages and pregnancy outcomes), table 1 below shows that (24%) of the women in the study had no children. Half of the sample (50%) had between one to three children, and (25%) had between four to six children. The remaining one percent, reported to have seven and more children. Fifteen percent of the respondents had between 1 to 4 miscarriages, while (81%) had no miscarriages. Two percent

had between 5 or more miscarriages and the other (2%) was missing values. In terms of pregnancy outcome (66%) of the women in the study had full-term pregnancies, (7%) had pre-term pregnancy and (2%) had miscarriages. Less than zero percent of the women reported voluntary termination of pregnancy and (1%) still birth. The remaining (24%) were for missing values.

Table 1: Socio-demographic profile of 606 urban women of childbearing age

	N (606)	**%**
Age (years)		
18-24	182	30.0
25-34	230	38.0
35-44	194	32.0
Race		
Black/ African	491	81.3
Coloured	67	11.1
White	45	7.4
Indian	1	0.2
Education		
Primary (Less than one year completed & Grade 1-7)	47	7.8
Secondary (Grade 8-12)	469	77.6
Tertiary (degree, diploma, further studies incomplete)	88	14.6
Marital status		
Married (legal/traditional married/co-habitation)	221	36.5
Unmarried (single/never married)	355	58.7
Not living together (divorced/widow/separate)	29	4.8
Employment status		
Unemployed	351	58.1
Employed (part-time/ full-time)	241	39.9
Self-employed	12	2.0
SES level		

Lower	91	15.0
Medium	221	36.5
Higher	283	46.7
Missing	11	1.8
Reproductive health		
Parity		
None	143	23.6
1-3 children	301	49.7
4-6 children	155	25.6
7-10 children	4	0.7
Missing	3	0.4
Miscarriage		
None	491	81.0
1- 4	93	15.3
5 or more	10	1.7
Missing	12	2.0
Pregnancy outcome		
Full-term	402	66.3
Pre-term	40	6.6
Still-born	8	1.3
Voluntarily terminated pregnancy	1	0.2
Miscarriage	9	1.5
Missing	146	24.1

Knowledge about alcohol effects on unborn foetus

In terms of knowledge regarding alcohol effects on an unborn foetus, (83%) of women in the total sample reported that drinking alcohol during pregnancy can affect the unborn foetus. Four percent reported that drinking alcohol during pregnancy has no effect on the unborn foetus, while the remaining (7%) reported that they did not know the effects. Six percent was missing values.

The results from the question on the effects of alcohol in pregnancy were categorised into physical (physical growth, special facial features and speech problems), mental (intelligence ability and learning problems) and social (social integration and behavioural problem) setbacks. According to table 2 below (72%) of the women reported that alcohol use can result in physical setbacks, while (15%) said the child would not have physical setbacks. Thirteen percent were missing values. Sixty seven percent reported that alcohol use in pregnancy can result in mental setbacks and (23%) said that it did not. The remaining (10%) were missing values. Fifty three percent of the women reported that alcohol can result in social setbacks.

The results show that (33%) of the study sample reported that alcohol use will not result in social setback. The remaining (14%) was missing values.

The same question on the effects of alcohol on pregnancy was used to determine the levels of knowledge about FAS. The findings show that (35%) of the women had higher on knowledge about FAS. The results indicate that (19%) had medium levels of knowledge and (31%) had lower levels of knowledge about FAS. The remaining (15%) were missing values.

Table 2: Knowledge about alcohol effects on unborn foetus among urban women

	N (606)	**%**
Does drinking during pregnancy have any effect on the unborn foetus?		
No	22	3.6
Yes/ sometimes	506	83.5
Don't know	42	7.0
Missing	36	5.9
In what ways can a baby be affected if the mother drinks during pregnancy? Knowledge Categories		
Physical setback		
No	93	15.3
Yes	436	72.0
Missing	77	12.7
Cronbach's alpha	0.76	
Mental setback		
No	138	22.8
Yes	405	66.8
Missing	63	10.4
Cronbach's alpha	0.75	
Social setback		
No	198	32.7
Yes	227	53.1
Missing	86	14.2
Cronbach's alpha	0.70	
Knowledge level		
Cronbach's alpha	0.89	
Low	208	34.3
Medium	217	36.0

High	162	26.7
Missing	19	3.0

Alcohol use

Forty percent of the total sample (N=605) reported have ever had a drink containing alcohol in their lifetime, while the remaining, (60%) percent had no lifetime use of alcohol. Past month (current use, N=161) findings show that the majority of women had used alcohol (75%) in the past month, (25%) had not used alcohol in the past month.

Table 3: Lifetime and current alcohol use by women of childbearing age

	N=606	**%**
Alcohol use		
Lifetime use (N=605)		
No	361	59.7
Yes	244	40.3
Current use (past month use)	**N=161**	
No	40	24.8
Yes	121	75.2
Pregnancy use (N=50)		
No	34	68.0
Yes	16	32.0

Pregnancy Status

Table 4 below reveals that (5%) of the total sample indicated that they were currently pregnant. Seventy one percent of the total sample was not pregnant and one percent did not know their pregnancy status. In terms of pregnancy history, thirty one percent of the women were last pregnant more than five years prior to the survey, (23%) were last pregnant between 2 and 5 years were while, (22%) were last pregnant in the previous year. The remaining (24%) were missing data.

Table 4: Pregnancy status of women during the study

	N (606)	%
Pregnancy status		
Not pregnant	432	71.3
Pregnant	29	4.8
Do not know	5	0.8
Missing	140	23.1
Last pregnancy		
0-1 year	135	22.3
2-5 year	137	22.6
> 5 year	188	31.0
Missing	146	24.1

Alcohol use 3 months pre- pregnancy

This section of the results used only the subsample of women who were pregnant. This reduced the denominator significantly from 606 to 29 women. The use of alcohol by this subsample of women 3 months before they were pregnant, and after they knew they were pregnant was determined by the frequency of use, days on which they drank, and number of drinks. Three months before they were pregnant, (58%) of the women used alcohol monthly, (11%) used alcohol weekly and (6%) used daily, while the remaining, (25%) did not use alcohol at all in the 3 months preceding their pregnancy.

Table 5 below, which shows the pattern of drinking 3 months pre- pregnancy, reveals that (36%) of women drank sometimes. However, there is a clear differential in the pattern of drinking by weekdays and weekends, whereby, (34%) of pre-pregnant women drank on weekends, while (4%) drank on weekdays. Nine percent drank on both weekdays and weekends and the remaining (17%) never drank alcohol. In terms of the amount of alcohol use 3 months before pregnancy, (58%) women drank between one to four drinks (6%) drank between five to nine drinks and (6%) consumed ten or more drinks. Thirty percent of the women had not taken any drink containing alcohol in past 3 months prior to pregnancy.

Alcohol use in Pregnancy

The results from table 5 below show that the majority of women did not use alcohol in pregnancy (68%), while (24%) used alcohol monthly, (6%) used alcohol weekly and the remaining (2%) used alcohol daily. As with alcohol use pre-pregnancy, there differential in

the pattern of drinking by weekdays and weekends, remains. Firstly, the majority of women (67%) indicated that they did not drink. Eleven percent of women indicated that they drank sometimes, (10%) drank on weekends, as opposed to (6%) indicated that they drank on weekdays. The remaining (6%) used alcohol on both weekdays and weekends after they knew they were pregnant Examining the amount of alcohol the women had after they knew they were pregnant revealed that (26%) of the women consumed one to four drinks containing alcohol, (6%) reported drinking five to nine drinks during pregnancy. The remaining (68%) did not use alcohol in pregnancy.

Table 5: Alcohol use during pregnancy by women of childbearing age

Frequency of use before pregnancy		
Often (N=48)		
Never	12	25.0
Monthly	28	58.3
Weekly	5	10.4
Daily	3	6.3
Days on which alcohol was drunk (N=47)		
Never	8	17.0
Sometimes	17	36.2
Weekdays	2	4.3
Weekends	16	34.0
Weekdays & Weekends	4	8.5
Amount (N=50)		
None	15	30.0
1-4 drinks	29	58.0
5-9 drinks	3	6.0
10 or more drinks	3	6.0
Frequency of use during pregnancy		
Often (N=50)		
Never	34	68.0
Monthly	12	24.0
Weekly	3	6.0
Daily	1	2.0
Days on which alcohol was drunk (N=48)		
Never	32	66.7
Sometimes	5	10.5
Weekdays	3	6.2
Weekends	5	10.4
Weekdays & Weekends	3	6.2

Amount (N=47)		
None	32	68.1
1-4 drinks	12	25.5
5-9 drinks	3	6.4
10 or more drinks	-	-

Association between socio-demographic profile and current alcohol use

The association between socio-demographic variables and current use was determined by Pearson chi-squared (and Fisher exact) test. Fischer exact test was used where the contingency tables had small sample sizes and one of the cells in the table had a zero or less than five in it. The strength of the association was shown by unadjusted odds ratio, and 95% confidence interval.

Table 6 below shows that (74%) of women in the 18-24 age group were current alcohol users, while (26%) had not used alcohol in the past month. Of the women in the 25-34 age group (75%) had used alcohol in the past month, while (25%) did not. Among the women in the 35-44 age group (77%) were past month users of alcohol, compared to (23%) who abstained. Odds ratio for 25-34 and 35-44 age groups were (OR = 1.1, CI = 0.45-2.51; OR=1.2, CI =0.50-3.04) respectively. Though there was no statistical significance (p=0.89), this implies that the women in these age groups are more likely to use alcohol in the past month than women in the young adult group (18-24 years).

In terms of race, (80%) of Black/African women were past month alcohol users, compared to (20%) who had not used alcohol in the past month. Among the Coloured women (71%) had used alcohol in the past month, while (29%) had not. Of the White women (68%) were current alcohol users, (32%) were not. Black/ African women were more likely to use alcohol in the past month as compared to Coloured (OR = 0.6, CI= 0.27-1.41) and White women (OR=0.7, CI=0.52-1.31), although there no statistical significance (p= 0.30). This is likely to be a result of the fact that Black African women made up the majority of the sample.

Table 6 below shows that of the women with primary education (83%) were past month users, (17%) had not used alcohol in the past month. Of the women who had secondary education (77%) were past month users of alcohol, while (23%) were not. Among the women with tertiary education, (68%) had used alcohol in the past month, while (32%) had

not. The odds ratio for women with secondary and tertiary education were (OR= 0.6, CI=0.07-5.83) and (OR= 0.4, CI=0.04-4.09) respectively. This suggests that women with secondary and tertiary education were less likely to use alcohol in the past month, than the women with primary education. There was no statistical significance between the education and current alcohol use (p= 0.57).

The results show that (72%) of married women used alcohol in the past month and (28%) abstained. Seventy seven percent of unmarried women were current users of alcohol compared to (23%) who abstained. Of the women not living together with their partners (77%) were current alcohol users, while (23%) were no. Although, there was no statistical significance between the marital status and current alcohol use (p= 0.83), the odds ratio for unmarried women was (OR=1.3, CI=0.58-2.7) and women not living with their partners (OR=1.3, CI=0.35-4.54) respectively, implying that unmarried women and women not living with partners were more likely to use alcohol in past month than the married women

Seventy percent of the unemployed women were current users of alcohol, while (30%) were abstainers. Among the employed women (80%) had used alcohol in the past month, (20%) did not. All the self–employed women did not use alcohol in the past month. There was almost statistical significance between the employment status and current alcohol use (p=0.06). The results show that there was an association between employed women and current alcohol use (OR = 1.78, CI= 0.86 – 3.70). This means employed women were more likely to use alcohol in the past month than unemployed women.

Of the women with lower SES (83%) had used alcohol in the past month, compared to (17%) who did not. Seventy six percent of the women with medium SES were current alcohol users, while (24%) were abstainers. Among the women with higher SES (74%) had used alcohol in the past month, while (26%) abstained for past month alcohol use. An odds ratio for medium (OR = 0.64, CI=0.06-6.04) and higher SES level was (OR = 0.58, CI=0.06-5.17), suggesting that women with medium and higher SES are less likely to use alcohol in the past month than the women with lower SES. However, there was no statistical significance between the SES level and current alcohol use (p= 1.00).

Of the women with no children (77%) had used alcohol in the past month, compared to (23%) who did not. Seventy one percent of the women with 1 to 3 children were current

alcohol users, while (29%) were abstainers. Among the women with 4 to 6 children (83%) had used alcohol in the past month, while (17%) abstained. All the women with 7 to 10 children (100%) had used alcohol in the past month. An odds ratio for women with 1 to 3 children was (OR = 0.7, CI= 0.31- 1.67), suggesting that they were less likely to be current users of alcohol and women with 4 to 6 children were more likely to use alcohol in the past month (OR=1.5, CI=0.45-4.84) than women with no children. However, there was no statistical significance between the parity and current alcohol use (p= 0.53).

The results show that (78%) of women who had no miscarriages had used alcohol in the past month and (22%) abstained. Sixty nine percent of the women who had 1 to 2 miscarriages were current users of alcohol compared to (31%) who abstained. Among the women who had 3 or more miscarriages (60%) were current users of alcohol, while (40%) did not. Although, there was no statistical significance between the miscarriage and current alcohol use (p= 0.31), the odds ratio for women with one to two and three or more miscarriages were (OR=0.6, CI=0.26-1.46 and OR=0.4, CI=0.07-2.65) respectively. This implies that women with one to two and three or more miscarriages were less likely to use alcohol in past month than the women who had no miscarriage.

Table 6 below shows that of the women who had full-term pregnancy outcome (74%) were past month users, (26%) had not used alcohol in the past month. Of the women who had pre-term pregnancy outcome (92%) were past month users of alcohol, while (8%) were not. Among the women who had still-birth, (25%) had used alcohol in the past month, (75%) abstained. All the women who had voluntarily termination of pregnancy were current alcohol users. There was statistical significance between the pregnancy outcome and current alcohol use (p= 0.05). The odds ratio for pre-term pregnancy outcome had shown strong association (OR= 4.22, CI=0.52-34.17) with current alcohol use than full-term pregnancy outcome. The odds ratio for still-born was (OR= 0.11, CI= 0.01-1.18). This implies that women who had pre-term pregnancy outcome were more likely to be current users of alcohol and women who had still-birth were less likely to use alcohol in the past month compared to women who had full-term pregnancy.

Table 6: Association between socio-demographics profile and current alcohol use

	Current Alcohol Use (N)		**P-value**	**OR (95% CI)**	**P-value**
Age % (N)	No	Yes	0.89**		0.89
18-24	26.5% (13)	73.5% (36)		1 (Reference)	
25-34	25.4% (15)	74.6% (44)		1.06 (0.45 – 2.51)	0.90
35-44	22.6% (12)	77.4% (41)		1.23 (0.50 – 3.04)	0.65
Race % (N)			0.30**		0.30
Black/ African	19.7% (16)	80.3% (65)		1 (Reference)	
Coloured	28.6% (14)	71.4% (35)		0.61 (0.27 – 1.41)	
White	32.3% (10)	67.7% (21)		0.71 (0.52 – 1.31)	
Education % (N)			0.57*		0.54
Primary	16.7% (1)	83.3% (5)		1 (Reference)	
Secondary	23.4% (29)	76.6% (95)		0.65 (0.07 – 5.83)	0.70
Tertiary	32.3% (10)	67.7% (21)		0.42 (0.04 – 4.09)	0.45
Marital status % (N)			0.83*		
Married	28.0% (14)	72.0% (36)		1 (Reference)	
Unmarried	23.4% (22)	76.6% (72)		1.27 (0.58 – 2.7)	0.54
Not living together	23.5% (4)	76.5% (13)		1.26 (0.35 – 4.54)	0.72
Employment status % (N)			0.06*		
Unemployed	29.9% (23)	70.1% (54)		1 (Reference)	
Employed	19.3% (16)	80.7% (67)		1.78 (0.86 – 3.70)	
Self-employed	100% (1)	0.0% (0)			
SES level			1.00*		

% (N)					
Low	16.7% (1)	83.3% (5)		1 (Reference)	
Medium	23.9% (11)	76.1% (35)		0.64 (0.06 - 6.04)	0.69
High	25.7% (27)	74.3% (78)		0.58 (0.06 – 5.17)	0.62
Reproductive health% (N)					
Parity **% (N)**			0.53*		
None	22.7% (10)	77.3% (34)		1 (Reference)	
1-3 children	29.1% (25)	70.9% (61)		0.71 (0.31 – 1.67)	
4-6 children	16.7% (5)	83.3% (25)		1.47 (0.45 – 4.84)	
7-10 children	0.0% (0)	100% (1)			
Miscarriage **% (N)**			0.31*		
None	22.0% (27)	78.0% (96)		1 (Reference)	
1- 2	31.2% (10)	68.8% (22)		0.62 (0.26 – 1.46)	
3 or more	40.0% (2)	60.0% (3)		0.42 (0.07 – 2.65)	
Pregnancy outcome % (N)			**0.05*** +		0.03
Full-term	26.0% (25)	74.0% (71)		1 (Reference)	
Pre-term	7.7% (1)	92.3% (12)		4.22 (0.52 – 34.17)	
Still-born	75.0% (3)	25.0% (1)		0.11 (0.01 – 1.18)	
Voluntary termination pregnancy	0.0% (0)	100% (2)			

*Fischer's exact test
**Chi-squared test

Association between knowledge about FAS and current alcohol use

Table 7 below shows that all the women with no knowledge about alcohol effects on an unborn foetus, were past month alcohol users (100%). Of the women with knowledge about alcohol effects on an unborn foetus, (73%) were current users of alcohol, while (27%) were

abstainers. Of the women who did not know about alcohol effects on unborn foetus were 100% current users of alcohol. There was almost statistical significance between the knowledge about alcohol effects on unborn foetus and current alcohol use (p= 0.08).

The results show that (78%) of the women with lower knowledge were past month alcohol users, compared to (22%) who abstained. Among the women with medium knowledge (75%) had used alcohol in the past month, while (25%) had not. Of the women with higher knowledge (71%) were current alcohol users, (29%) were not. The strength of the association for the women with medium knowledge level was (OR= 0.82, CI =0.34-1.95) and for higher knowledge level (OR=0.68, CI= 0.25-1.84). This implies that women with medium and higher knowledge level were less likely to use alcohol in past month than the women with lower knowledge. There was no statistical significance between the knowledge level and current alcohol use (p= 0.75).

Table 7: Association between knowledge about the effect of alcohol use during pregnancy and current alcohol use

	Current Alcohol Use (N)		**P-value**	**OR (95% CI)**	**P-value**
Knowledge question % (N)	No	Yes	0.08*		0.53
No	0.0% (0)	100% (9)			
Yes	27.2% (40)	72.8% (107)		0.67 (0.19 - 2.36)	
Don't know	0.0% (0)	100% (5)			
Knowledge Level % (N)			0.75**		0.58
Lower	21.7% (10)	78.3% (36)		1 (Reference)	
Medium	25.3% (19)	74.7% (56)		0.82 (0.34-1.95)	
Higher	29.0% (11)	71.0% (27)		0.68 (0.25-1.84)	

*Fischer's exact test
**Chi-squared test

Association between socio-demographic profile and alcohol use during pregnancy

Table 8 below shows that (37%) of women within the 18-24 age group were users of alcohol during pregnancy, (63%) were not. Of the women in the 25-34 age group (41%) had used

alcohol during pregnancy, while (59%) did not. Among the women in the 35-44 age group (20%) were users of alcohol during pregnancy, compared to (80%) who not users. The women in age group 25-34 (OR= 1.1, CI=0.22-6.10) are more likely to use alcohol during pregnancy and women in age group 35-44 years (OR = 0.42, CI=0.07-2.53) are less likely to use alcohol during pregnancy than women in the age group 18-24 years. However, there was no statistical significance between age and alcohol use during pregnancy (p=0.31).

The results show that (41%) of Black/African women were users of alcohol during pregnancy, compared to (59%) of the remaining Black women in the sample, abstained. Among the Coloured women (33%) had used alcohol in pregnancy, while (67%) had not. Of the White women (10%) were users of alcohol during pregnancy, (90%) were not. Although, there was no statistical significance (p= 0.26), the Coloured (OR= 0.72, CI=0.20-2.64) and White (OR=0.16, CI=0.02-1.50) women were less likely to be users of alcohol in pregnancy than their Black/African counterparts. However, this may also be a reflection of the overwhelming majority of Black African women in the sample.

The findings below shows that of the women with primary education (20%) were users of alcohol during pregnancy, (80%) were abstainers. Of the women who had secondary education (35%) were users of alcohol during pregnancy, while (65%) were not. Among the women with tertiary education, (20%) had used alcohol during pregnancy, while (80%) did not. The odds ratio for tertiary education was (OR= 1.0, CI =0.04-21.17) and secondary education (OR= 2.1, CI=0.04- 22.17) was strongly associated with alcohol use during pregnancy. This implies that women with secondary education are more likely to use alcohol during pregnancy than women with primary education. There was no statistical significance between the education and alcohol use during pregnancy (p= 0.76).

The results show that (36%) of married women used alcohol during pregnancy and (64%) abstained. Thirty percent of unmarried women were users of alcohol during pregnancy compared to (70%) who abstained. Of the women not living together with their partners (20%) were users of alcohol during pregnancy, while (80%) were not. The odds ratio for unmarried women were (OR= 0.76, CI=0.22-2.65) and women not living with their partners (OR= 0.43, CI=0.04-4.62), respectively. This implies that unmarried women and women not living with their partners were less likely to use alcohol during pregnancy than the married

women. However, there was no statistical significance between the marital status and alcohol use during pregnancy (p= 0.83).

Thirty eight percent of the unemployed women were users of alcohol during pregnancy, while (62%) were abstainers. Among the employed women (25%) had used alcohol during pregnancy, (75%) did not. One hundred percent of self–employed women abstained from alcohol during pregnancy. The odds ratio for employment status was (OR = 0.50, CI= 0.15-1.65), suggesting that employed women were less likely to use alcohol during pregnancy, than the unemployed women. There was no statistical significance between the employment status and alcohol use during pregnancy (p= 0.57).

Of the women with lower SES (40%) had used alcohol during pregnancy, compared to (60%) who did not. Thirty one percent of the women with medium SES were users of alcohol during pregnancy, while (69%) were abstainers. Among the women with higher SES (32%) had used alcohol during pregnancy, while (68%) abstained. An odds ratio for SES level suggests that women with medium (OR= 0.68, CI=0.08-5.44) and higher (OR=0.71, CI=0.10-5.02) SES were less likely to use alcohol during pregnancy than the women with lower SES. However, there was no statistical significance between the SES level and alcohol use in pregnancy (p= 1.00).

Of the women who with no children (33%) had used alcohol during pregnancy, compared to (67%) who did not. Thirty nine of the women with 1 to 3 children were alcohol users in pregnancy, while (69%) were abstainers. Among the women with 4 to 6 children (17%) had used alcohol during pregnancy, while (83%) abstained. All the women with 7 to 10 children (100%) had used alcohol during pregnancy. An odds ratio for women with 4 to 6 children were (OR= 0.40, CI= 0.26-5.96) and women with 1 to 3 children (OR=1.3, CI=0.10-16.0), respectively. Women with 4 to 6 children were less likely to be users of alcohol during pregnancy, while women with 1 to 3 children were more likely to use alcohol during pregnancy than women with no children. However, there was no statistical significance between the parity and alcohol use during pregnancy (p= 0.14).

The results show that (34%) of women who had no miscarriages had used alcohol during pregnancy and (66%) abstained. Twenty three percent of the women who had 1 to 2 miscarriages were users of alcohol during pregnancy compared to (77%) who abstained.

Among the women who had 3 or more miscarriages (50%) were users of alcohol during pregnancy, while (50%) did not. The odds ratio for women with 1 to 2 miscarriages (OR= 0.58, CI=0.51-2.27) were less likely to use during pregnancy than women with no miscarriage. There was strong association between women with 3 or more miscarriages (OR= 1.9, CI=0.23-15.58) than women who had no miscarriages. This implies that women with 3 or more miscarriages were more likely to use alcohol during pregnancy than women who had no miscarriage. There was no statistical significance between the miscarriage and alcohol use during pregnancy (p= 0.52).

Table 8 below shows that of the women who had full-term pregnancy outcome (37%) were alcohol users during pregnancy, (68%) had not. Of the women who had pre-term pregnancy outcome (18%) were users of alcohol during pregnancy, while (82%) were not. All the women who had still-birth, (100%) had abstained from using alcohol during pregnancy. All the women who had voluntarily termination of pregnancy were users of alcohol during pregnancy. The individual variables show that pre-term pregnancy outcome had shown less than one odds ratio (OR= 0.38, CI= 0.70-2.01). This implies that women who had pre-term pregnancy outcome were less likely to be users of alcohol during pregnancy than women who had full-term pregnancy outcome. There was no statistical significance between the pregnancy outcome and alcohol use during pregnancy (p= 0.22).

Table 8: Association between socio-demographics profile and pregnancy alcohol use

	Alcohol Pregnancy Use (N)		**P-value**	**OR (95% CI)**	**P-value**
Age % (N)			0.31*		0.31
18-24	62.5% (5)	37.5% (3)		1 (Reference)	
25-34	59.1% (13)	40.9% (9)		1.1 (0.22 – 6.10	0.87
35-44	80.0% (16)	20% (4)		0.4 (0.07 – 2.53	0.34
Race % (N)			0.26*		0.17
Black/ African	59.1% (13)	40.9% (9)		1 (Reference)	
Coloured	66.7% (12)	33.3% (6)		0.72 (0.20 – 2.64)	0.62
White	90.0% (9)	10.0% (1)		0.16 (0.02 – 1.50)	0.11
Education % (N)			0.76*		0.64

Primary	80.0% (4)	20.0% (1)		1 (Reference)	
Secondary	65.0% (26)	35.0% (14)		**2.15 (0.21 – 21.17)**	0.51
Tertiary	80.0% (4)	20.0% (1)		1.00 (0.04 – 22.17)	1.00
Marital status % (N)			0.83*		0.75
Married	63.6% (14)	36.4% (8)		1 (Reference)	
Unmarried	69.6% (16)	30.4% (7)		0.76 (0.22 – 2.65)	0.67
Not living together	80.0% (4)	20.0% (1)		0.43 (0.04 – 4.62)	0.49
Employment status % (N)			0.57*		0.34
Unemployed	62.1% (18)	37.9% (11)		1 (Reference)	
Employed	75.0% (15)	25.0% (5)		0.50 (0.15 – 1.92)	0.35
Self-employed	100% (1)	0.0% (0)			
SES level % (N)			1.00*		0.93
Low	60.0% (3)	40.0% (2)		1 (Reference)	
Medium	68.8% (11)	31.3% (5)		0.68 (0.08 – 5.44)	0.72
High	67.9% (19)	32.1% (9)		0.71 (0.10 – 5.02)	0.73
Reproductive health% (N)					
Parity **% (N)**			0.14*		0.25
None	66.7% (2)	33.3% (1)		1 (Reference)	
1-3 children	60.7% (17)	39.3% (11)		1.3 (0.10 – 16.04)	0.84
4-6 children	83.3% (15)	16.7% (3)		0.40 (0.26 – 5.96)	0.51
7-10 children	0.0% (0)	100% (1)			
Miscarriage **% (N)**			0.52*		0.54
None	65.5% (19)	34.5% (10)		1 (Reference)	

1- 2	76.5% (13)	23.5% (4)		0.50 (0.15 – 2.27)	0.44
3 or more	50.0% (2)	50.0% (2)		1.90 (0.23 – 15.58)	0.55
Pregnancy Outcome **% (N)**			0.27*		0.22
Full-term	62.9% (22)	37.1% (13)		1 (Reference)	
Pre-term	81.8% (9)	18.2% (2)		0.38 (0.70 – 2.01)	0.25
Still-born	100.0% (1)	0.0% (0)			
Voluntary termination pregnancy	0.0% (0)	100% (1)			

*Fischer's exact test

Association between knowledge about FAS and alcohol use during pregnancy

The results show that (20%) women with no knowledge about alcohol effects on an unborn foetus were users of alcohol during pregnancy, while (80%) were abstainers. Of the women with knowledge about alcohol effects on an unborn foetus, (34%) were users of alcohol during pregnancy. There was strong association between women with knowledge about alcohol effects on an unborn foetus (OR= 2.10, CI= 0.21- 20.19) and alcohol users during pregnancy. This implies that the women with no knowledge about alcohol effects on unborn foetus are less likely to use alcohol during pregnancy, than women with knowledge. However, there was no statistical significance between the knowledge about alcohol effects on unborn foetus and alcohol use during pregnancy use (p= 0.47).

Table 9 below shows that (38%) of the women with lower knowledge of alcohol effects on foetus were alcohol users during pregnancy, while (62%) were abstainers. Among the women with medium knowledge (15%) had used alcohol during pregnancy, while (85%) had not. Of the women with higher knowledge (50%) were alcohol users during pregnancy, (50%) were not. The women with medium knowledge level (OR= 0.20, CI=0.21-20.19) were less likely to use alcohol during pregnancy than women with lower knowledge level. However, the women with higher knowledge level were more (OR= 1.6, CI=0.36-7.07) likely to use alcohol during pregnancy, than women with lower knowledge level. There was almost statistical significance between the knowledge level and alcohol use during pregnancy (p= 0.08).

Table 9: Association between knowledge about the FAS and alcohol use during pregnancy

	Alcohol Pregnancy Use (N)		**P-value (Fischer's exact)**	**OR (95% CI)**	**P-value**
Knowledge question % (N)	No	Yes	0.47*		0.51
No	80.0% (4)	20.0% (1)		1 (Reference)	
Yes	65.9% (29)	34.1% (15)		2.07 (0.21-20.19)	
Knowledge Level % (N)			0.08		0.06
Lower	61.5% (8)	38.5% (5)		1 (Reference)	
Medium	85.0% (17)	15.0% (3)		0.2 (0.05- 1.48)	
Higher	50.0% (8)	50.0% (8)		1.6 (0.36- 7.07)	

*1 Sided Fischer's Exact test

CHAPTER 5: Discussion AND Conclusion

This study aimed to determine the relationship between knowledge about the effects of alcohol on pregnancy and alcohol use in general, and in pregnancy. It was premised on the Health Belief Model, a theoretical framework exploring the constructs of perceived susceptibility and severity in relation to alcohol use. In addition to the socio-demographic measures, other measures included: assessing knowledge of alcohol effects on pregnancy, current use and use in pregnancy. The knowledge variable included a single response knowledge question and a knowledge scale on alcohol effects; lifetime and current use and frequency of alcohol use, in pregnancy.

Socio-demographic profile of the sample

Univariate analysis revealed that the majority of the women in the sample were Black/African women (81%); between the ages in the age group 25-34 years. The racial distribution is in line with that of the Tshwane Municipality, and national demographic statistics (Statistics South Africa, 2010). Of all the women in the sample, majority, (77%) had secondary education (grade 8 -12) and were single (never married).

In accordance with the Labour Force Survey (LFS), more than a decade of trend data consistently record women as having higher unemployment rates compared to men. In 2010, of the total increase in unemployment (145 000), the unemployment rate for women increased by a staggering (77%), (Statistics South Africa, 2010). This is reflected in the present study, where, (58%) of the sample were unemployed. In spite of high unemployment rates, forty seven percent of women indicated higher SES status. This could be due to either a methodological limitation of using only an asset indicator as a proxy measure for SES, or may in fact reveal that despite being unemployed, Urban South African women may be acquiring assets through other means. Recent research has revealed the existence of transactional sex, (Dunkle, Jewkes, Brown, Gray, McIntryre & Harlow, 2004) as one means of acquiring assets. In the context of risky drinking, this is a plausible explanation.

The reproductive history of these women shows that majority of the women had between 1 to 3 children, despite being unmarried. This in keeping with the parity levels among Black South African women, (Coovadia, et al. 2009) whereby it is not uncommon to have a child

out of wedlock. Of the women in the sample, a majority (81%) of them had no miscarriages as indicated by the fact that they had full-term pregnancy outcomes.

In terms of knowledge, findings revealed that the majority of women knew that alcohol has some effect on the unborn foetus. However, the knowledge of the different types of effects, (physical, social and mental) differed. Most women seemed to lack knowledge on mental setbacks for the child compared to physical and social setbacks respectively. This is notable, as the link between physical and mental setbacks are intertwined, whereby brain damage caused by alcohol use during pregnancy leads to mental setbacks (NIAA, 2008). This brain damage can occur as early as 6 weeks in pregnancy (Clarren 1996). One explanation for this may be due to the intangible nature of mental setbacks early on in pregnancy and after birth. Hence, women may not perceive their child to be at risk. The physical setbacks were shown to be well known by the women compared to social and mental setbacks. This is in keeping with the theoretical argument informed by the HBM and by this thesis, which argues that if a person does not perceive a real threat or risk to themselves or their foetus, they are unlikely to engage in a healthy behaviour.

Current Alcohol use

More than half of the women in the study had used alcohol in their lifetime and a staggering (76%) used alcohol at a risky level (1-4 drinks) in the 3 months prior to pregnancy. This is a common pattern of drinking among women in South Africa, whereby, in spite of drinking less on average, than men, they drink at risky levels and particularly on weekends, (Parry, 2005a; Parry 2007/2008). The fact that the majority of the sample drank at risky levels (58%) pre-pregnancy suggests that women in this urban sample are at a risk of an alcohol exposed pregnancy. This is reflective of the South African profile (Morojele, et al. 2010) and points to the need for a focus on urban/rural differences in drinking patterns and consequent prevention planning.

Alcohol use in Pregnancy

Given that the number of people who were pregnant in this study was very low, the following results should be interpreted with caution. Of the total number of pregnant women (N=29), (24%), indicated using alcohol monthly, (6%) indicated using alcohol weekly and the majority (68%) did not use alcohol in pregnancy. Several studies show that reported consumption during pregnancy is usually lower than pre-pregnancy levels (Alvik et al., 2006;

Bruce et al., 1993). This is reflected in this study. Though the small numbers limit the researcher's ability to conclude this, it is not unlikely that for the women who were pregnant, reported consumption is likely to be lower. On the other hand, Zammit et al., (2008), found that patterns of drinking pre-pregnancy are likely to reflect patterns in pregnancy. The present study reflects this somewhat, whereby, the women in both pre-pregnancy and pregnancy were highest monthly users of alcohol respectively. In addition, the women who indicated drinking "sometimes" and on "weekends, also reflect similar findings of those who in pregnancy. [The women consumed 1 to 4 drinks in both pre-pregnancy (58%) and during pregnancy (26%)]. However, larger samples of pregnant women may yield more conclusive findings about this pre and in pregnancy patterns.

Association between socio-demographic profile and current alcohol use

The women in the age group 25-34 were shown to be the highest current users of alcohol generally, followed by women of 35-44 years and 18-24 years respectively. This is keeping with both South African (May et al., 2008) and international studies, (Center for Disease Control, 2009) on prenatal alcohol use, which showed women older than 30 years to be the highest alcohol users. The findings of this study reflect this pattern somewhat.

In terms of race, Black African women were the highest current consumers of alcohol. This is contrary to Parry (2007/2008) that found that being Coloured and White was a risk factor for alcohol use among urban women. However, these findings are in keeping with the racial distribution of the sample in this urban area. Future studies with a more comparable number of women representing each race group may yield different findings.

The women who were single, with higher levels of education, who were employed and from a higher SES were shown to be the highest current users of alcohol. Most notably, employment status was statically significant for current alcohol use. This is not surprising, given that this profile of women are likely to have access to more disposable income, be able to access alcohol more easily and be part of a social circle of people who drink.

Regarding reproductive history, the women who had 1 to 3 children were shown to be the highest current users of alcohol, followed by women with no children, 4 to 6 children and 7 to 10 children respectively. The women with no miscarriages were shown to be the highest current users of alcohol, followed by women who had 1 to 2 miscarriages and 3 or more

miscarriages respectively. Not surprisingly, the women with one, two, three or more miscarriages were less likely to use alcohol in the past month. This could the explained by the susceptibility construct of HBM, that state that if a person believes they to be in some jeopardy to their health or that of their foetus, they are unlikely to engage in a risky behaviour.

This is further reinforced by the finding that women who had full-term pregnancy outcomes were shown to be the highest current users of alcohol, followed by women who had pre-term, voluntarily termination of pregnancy and still-born pregnancy outcome, respectively. In this case, women who had full-term pregnancies were not likely to perceive a threat to use of alcohol during their childbearing years because of previous successful pregnancy outcomes, as compared to those women who were pre-term, terminated or had still births. Most notably, pregnancy outcome was statically significant for current alcohol use, whereby women who had pre-term pregnancy outcome were more likely to be current alcohol users. This supports that hypothesis that when severity (perceived or real) is high, then a person is less likely to engage in the risky behaviour.

Association between socio-demographic profile and alcohol use in pregnancy

With the exception of marital and employment status, the socio-demographic characteristics of the women's current use of alcohol reflected similar patterns for pregnancy, What this means, is that Black women aged between 25-34 years old, who were more educated, and from a higher SES, were more likely than younger and older women to use alcohol in general. The differences of use in pregnancy are related to marital and employment status only, whereby married women, who were unemployed where more likely to use alcohol in pregnancy than their unmarried, employed counterparts. While more research with bigger samples of pregnant women is required to make conclusive arguments, the researcher argues for one potential reason for this finding. The argument is that, living with a partner who drinks and who is likely to provide some level of income, is likely to impact on their own drinking patterns. The former argument is supported by a previous study (Morojele, et al. 2010).

Association between knowledge of alcohol use and Current use

In terms of, the relationship between, knowledge of the effects of alcohol on an unborn foetus, and current use, findings revealed almost statistically significant results. Women who

knew of the effects were shown to be the highest current users of alcohol, compared to those with no knowledge. In terms of knowledge levels, women with higher knowledge were the highest current users of alcohol, followed by women with medium and lower knowledge respectively. This is a curious finding, and suggests that knowledge alone is not sufficient to deter women from using alcohol in general. Previous research has been criticized for not paying sufficient attention to the multiple factors influencing behaviour change (Noar, Zimmerman, 2004). Thus, this study reinforces the need for further research into the determinants of alcohol use, both in general, and in pregnancy. It concludes that while education is an important influencing factor for determining behaviour, and perceived susceptibility and severity are important constructs for determining behaviour, they may play a meditational rather than a determining role.

Though there was almost statistical significance between knowledge levels and alcohol use during pregnancy, this is likely to be the result of the small number of pregnant women in the current sample. Future research will benefit from a focus on bigger sample sizes of pregnant women and likely yield more conclusive results about these associations.

Limitations and Future Directions

This study has a few limitations, worthy of mention, namely, the use of self- report questionnaires suggests that, participants may have answered in a socially desirable manner. Given the fact that alcohol use among women, and particularly pregnant women is considered taboo, there is an increased likelihood of women answering in a socially desirable manner. A cursory glance of the total numbers for questions related to alcohol use in pregnancy revealed that in some cases, numbers varied between 29 and 50 women. While this may suggest some variation in understanding the pregnancy-related questions, it may also be symptomatic of under-reporting, due to stigma.

A further limitation of this study relates to recall bias and potential misunderstanding of the questions related to current status of pregnancy and their last pregnancy. As a secondary study the researcher was unable to ensure that the manner in which questions were asked would directly answer the questions of this thesis.

Finally, the small sample size of pregnant women in the study restricts the researcher in drawing conclusions about the associations between the independent and dependent variables. Future studies will benefit from much larger sample sizes to draw more convincing

conclusions. This study is however, a useful starting point for understanding the socio-demographic profile of urban women in relation to alcohol use in general in pregnancy; and the relationship between knowledge of alcohol effects and use in general and in pregnancy. The available findings suggest the need for urban/rural specific prevention planning.

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APPENDIX 1: Confirmation Letter ()

UNIVERSITEIT VAN PRETORIA
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Faculty of Health Sciences
School of Health Systems and Public Health

6 July 2010

Ms Leane Ramsoomar
Lecturer and Academic Co-ordinator
Masters in Public Health Program
School of Public Health
Wits Medical School
7 York Road
Parktown, Johannesburg

Dear Ms Ramsoomar,

We hereby grant permission to Ms Lehlohonolo Tebogo Chandu to use the data set from the Comprehensive FAS Prevention Programme research project (supported by Cooperative Agreement Number 1 U01 DD00044 from the Centers for Disease Control and Prevention; CDC), to conduct a secondary data analysis study for the purposes of her MPH project.

We wish Ms Chandu the best of luck with her project.

Yours sincerely

Dr Kirstie Rendall Mkosi (Principal Investigator)

Dr Neo Morojele (Co-Principal Investigator)

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APPENDIX 2: Code List

Appendix A

CODE LIST

The secondary data analysis will use this code list to recode the variables to meet the needs of the analysis. The interviewer numbers from the primary study will be recoded to 1-606 for the secondary data analysis.

Independent variable

1. Knowledge

1.1. Does the drinking of alcohol during pregnancy have any effect on the unborn fetus?

No ☐ 0 Yes/sometimes ☐ 1 Do not know ☐ 2

1.2. In what ways can a baby be affected if a mother drinks in pregnancy?

Physical setback No ☐ 0 Yes ☐ 1
(Physical growth, special facial features, speech problems)

Mental setback No ☐ 0 Yes ☐ 1
(Intellectual ability, learning problems)

Social setback No ☐ 0 Yes ☐ 1
(Social integration, behavioral problems)

1.3 From the above questions a knowledge categorical variable will be coded as follows:

Equal to one and less than zero will be regarded as low level of knowledge = 0. At two and three will be considered high level of knowledge = 1.

Low level of knowledge ☐ 0
(0)

Middle level of knowledge ☐ 1
(1-2)

High level of knowledge ☐ 2
(3)

2

2. Socio-demographic profile

2.1. How old are you? _____in years

The numeric age variable will be recoded into a categorical variable as follows:

Age

18-30	☐	1
31-44	☐	2

2.2. What is the highest level of education you have passed?

The education status will be categorized into the following groupings:

Education

Preprimary (less than one year completed)	☐	0
Primary (Grade 1-7)	☐	1
Secondary (grade 8-12)	☐	2
Tertiary (degree, diploma, further studies incomplete)	☐	3

Marital status

2.3. What is your current marital status? ☐

The following variables will be will be categorized into groups:

Married/cohabitation (Legally married, traditionally married and living with man or woman in union)		1
Unmarried (Single/never married)	☐	2
Not living together (Divorced/widow/separate)	☐	3

2.4. Which race group do you consider yourself to belong to?

The race variable will be coded as:

Race

Black/African	☐	1
Coloured	☐	2
White	☐	3
Asian/Indian	☐	4

2.5. Which of the following describes your current employment status?

The employment status variable will be classified as unemployed, employed and self-employed.

Employment status

Unemployed	☐	0
Employed (Part time and full time)	☐	1
Self-employed	☐	2

2.6. Does your house have?

There were eight assets and commodities listed items: Electricity, radio, television, telephone, fridge, computer, washing machine and cell phone. Less than five will be regarded as low socio-economics status (SES) = 0. Five and more items will be considered high socio-economic status (SES) = 1.

Socio-economics status (SES)

(Any asset and commodity)

0-2 items	☐	0

Low SES

3-5 items ☐ 1

Middle SES

6-8 items ☐ 2

Middle SES

Reproductive health history (pregnancy experiences)

How many children have you given birth to in your lifetime?

None ☐ 0

1-3 children ☐ 1

Low parity

4-6 children ☐ 2

Middle parity

7-10 children ☐ 3

High parity

How many miscarriages have you had in total, if any?

None ☐ 0

1 to 2 ☐ 1

3 to 4 ☐ 2

5 or more ☐ 3

What was the outcome of the pregnancy?

Full-term ☐ 1

Pre-term (premature) ☐ 2

Still-born ☐ 3

Voluntarily terminated pregnancy ☐ 4

Miscarriage ☐ 5

Dependent variables

1. Alcohol use

Lifetime alcohol use

1.1. Have you ever had a drink containing alcohol?

No ☐ 0 (Exclusion criteria)

Yes ☐ 1 (Inclusion criteria)

Current alcohol use

1.2. Do you still take a drink with alcohol sometimes?

No ☐ 0

Yes ☐ 1

1.3. How often do you have a drink containing alcohol?

The coding will remain the same.

>= Monthly ☐ 1

2 to 4 times a month ☐ 2

2 to 3 times a week ☐ 3

6

4 or more times a week ☐ 4

1.4. How many days have you drunk alcohol during the past month?

The data will be dichotomized into categories.

No. of days

0-5 ☐ 0

6-10 ☐ 1

11-25 ☐ 2

26-30 ☐ 3

Alcohol use in pregnancy

1.5. How many months pregnant are you right now?

In this study the answers for pregnancy months will be categorized into trimesters.

Not pregnant ☐ 0

1st trimester (1-3 months) ☐ 1

2nd trimester (3-6 months) ☐ 2

3rd trimester (7-9 months) ☐ 3

Don't know ☐ 4

1.6. When last were you pregnant?

The answers will be recoded by having three categories.

0 - 1 year ☐ 1

2-5 years ☐ 2

> = 5 years ☐ 3

1.7. Did you plan to stop drinking because of the pregnancy?

The coding will remain the same as the in the primary study except that not applicable.

Yes ☐ 1

No ☐ 0

Pattern of alcohol use: before and after knowing about the pregnancy

1.8. During the three months before you became pregnant how often did you drink?

Never ☐ 0

Monthly ☐ 1
(Monthly or less, 2 to 4 times a month)

Weekly ☐ 2
(2 to3 times a week)

Daily ☐ 3
(4 or more times a week)

1.9. During the three months before you became pregnant, on what days did you drink?

Never ☐ 0

Sometimes ☐ 1

Weekdays only ☐ 2

Weekends only ☐ 3

Both ☐ 4
(Weekends and weekdays)

1.10. During the three months <u>before you became pregnant</u>, how many drinks containing alcohol did you have on a typical day when you were drinking?

<u>Binge drinking</u>

The data will be recoded into the following.

None ☐ 0

1-5 ☐ 1

5-10 ☐ 2

10 or more ☐ 3

1.11. <u>After you knew you were pregnant</u> how often did you have a drink containing alcohol?

Never ☐ 0

Monthly ☐ 1
(Monthly or less, 2 to 4 times a month)

Weekly ☐ 2
(2 to3 times a week)

Daily ☐ 3(4 or more times a week)

9

1.12. <u>After you knew you were pregnant</u> on what days did you drink alcohol?

The coding will be done in this way.

Never	☐	0
Sometimes	☐	1
Weekdays only	☐	2
Weekends only	☐	3
Both (Weekends and weekdays)	☐	4

1.13. <u>After you knew you were pregnant</u> how many drinks containing alcohol did you have on a typical day when you were drinking?

<u>Binge drinking</u>

The numerical variable will be recoded into a categorical variable this way.

None	☐	0
1-5	☐	1
5-10	☐	2
10 or more	☐	3

1.14. Have your ever been told that a child of yours has fetal alcohol syndrome?

In this data, the not applicable will not be included.

No	☐	0
Yes	☐	1

10

APPENDIX 3: Ethics Clearance

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG
Division of the Deputy Registrar (Research)

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)
R14/49 Mrs Lehlohonolo T Chandu

CLEARANCE CERTIFICATE	**M10105**
PROJECT	The Relationship between Knowledge of Alcohol Effects on Pregnancy and Alcohol Use among a Start a Sample of Urban Women
INVESTIGATORS	Mrs Lehlohonolo T Chandu.
DEPARTMENT	School of Public Health
DATE CONSIDERED	29/10/2010
DECISION OF THE COMMITTEE*	Approved unconditionally
	29/10/2010

Unless otherwise specified this ethical clearance is valid for 5 years and may be renewed upon application.

DATE 29/10/2010 **CHAIRPERSON** .....
(Professor PE Cleaton-Jones)

*Guidelines for written 'informed consent' attached where applicable
cc: Supervisor : Leane Ramsoomar

DECLARATION OF INVESTIGATOR(S)

To be completed in duplicate and **ONE COPY** returned to the Secretary at Room 10004, 10th Floor, Senate House, University.
I/We fully understand the conditions under which I am/we are authorized to carry out the abovementioned research and I/we guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Committee. **I agree to a completion of a yearly progress report.**

PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES...

THE RELATIONSHIP BETWEEN KNOWLEDGE OF ALCOHOL EFFECTS ON PREGNANCY AND ALCOHOL USE AMONG A SAMPLE OF URBAN WOMEN

Lehlohonolo Tebogo Chandu

A Research Report submitted to the Faculty of Health Sciences, University of the Witwatersrand, Johannesburg, in partial fulfilment of the requirements for the degree, Master of Public Health

Johannesburg, February 2011

DECLARATION

I, **Lehlohonolo Tebogo Chandu** declare that this research report is my own, unaided work. It is being submitted for the Degree of Master of Public Health in the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in any other University.

_____ [Signature of Candidate]

…28th …… day of ……February… 2011.

DEDICATION

I dedicate this work to:

My Lord and Saviour, my husband and my three sons

ABSTRACT

Alcohol is a major public health problem globally. According to the World Health Organization (WHO) report, alcohol accounts for 2.5 million deaths (4% of total) and 69.4 million (4.5% of total) of Disability-Adjusted Life Years (DALYs), (WHO, 2002, 2011). In South Africa, alcohol was found to be the third highest contributor to death and disability (Parry, 2007/8). Among the many far-reaching consequences of alcohol use in South Africa, Fetal Alcohol Syndrome (FAS) in certain regions in the country, rates among the highest in the world (May et al., 2007). Despite higher comparative levels of FAS in rural areas, almost one third of the population in urban sites (Gauteng) demonstrates that FAS is not exclusively a problem of South African rural areas. This study hypothesized that higher knowledge levels about the effects of alcohol on pregnancy may deter use among women. Employing secondary data analysis from a 2006 cross-sectional household survey, this study explored the prevalence of alcohol use among urban women (18-44 years) in the Tshwane Municipality, in general and in pregnancy. It also examined the relationship between knowledge of alcohol effects on pregnancy and alcohol use. A significant association was found between employment status, pregnancy outcome and general alcohol use among women. An almost significant association was found between knowledge of alcohol effects on pregnancy and past month alcohol use, knowledge levels and alcohol use during pregnancy. Findings partially support the hypothesis. However, knowledge of alcohol effects on pregnancy alone cannot deter women from using alcohol. Multiple influencing factors should be considered in planning prevention programmes for urban women's alcohol use. Further research with larger sample sizes of pregnant women is suggested to explore the associations conclusively.

ACKNOWLEDGEMENTS

Dear Ms. Leane Ramsoomar, this project would not have been possible without your continuous guidance, support and encouragement. It was indeed a humbling experience working with you.

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I also thank my three sons S'thembiso, S'fezekile and S'thandiweinkosi whom I gave birth to in the period of my study, for all the time you missed being with me.

Lastly, I wish to express my gratitude to my parents, for always being there to assist with the children.

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ACRONYMS

AEP	Alcohol Exposed Pregnancy
AIDS	Acquired Immune Deficiency Syndrome
AOR	Adjusted Odds Ratio
BAC	Blood Alcohol Concentration
DALYS	Disability-Adjusted Life Years
FARR	Foundation for Alcohol Related Research
FAS	Fetal Alcohol Syndrome
HBM	Health Belief Model
HIV	Human Immuno-deficiency Virus
HREC	Human Research Ethics Committee
MRC	Medical Research Council
NIAAA	National Institute on Alcohol Abuse and Alcoholism
OR	Odds ratio
PAE	Pregnancy Alcohol Exposure
PG	Post Graduate

SES	Socio-Economic Status
WHO	World Health Organization

CHAPTER 1: INTRODUCTION

The purpose of this study was to conduct secondary data analysis on household survey data to describe the prevalence of alcohol use among a sample of urban women (18-44 years) in the Tshwane Municipality in general and during pregnancy. In addition it explored the nature of the relationship between knowledge of alcohol effects on pregnancy and alcohol use in general and in pregnancy.

Background

Alcohol is a major public health problem globally. According to the World Health Organization (WHO) report, alcohol accounts for 2.5 million deaths (4% of total) and 69.4 million (4.5% of total) of Disability-Adjusted Life Years (DALYs), (WHO, 2002, 2011). Approximately two billion people across the world consume alcoholic beverages (WHO, 2011).

Alcohol has played a pivotal role in the history of South Africa. It has been directly linked to the oppression of the black majority by the use of *dop* system -the use of alcohol as part payment for farm worker wages (Parry and Bennetts, 1998). Alcohol has also been linked to the resistance of such oppression (Parry and Bennetts, 1998). The resistance resulted in the proliferation of illegal "shebeens" (Parry et al., 2005). This led to unmonitored drinking patterns and abuse, which still affects the present generations (Setlalentoa, Pisa, Thekisho, Ryke & Loots, 2010). Post the oppression and resistance era, alcohol continued to play a controversial role in society, being hailed on the one hand as stimulating employment for emerging black entrepreneurs, and condemned on the other for causing alcohol attributable diseases and deaths to many and placing an enormous burden on public health in the country (Parry, 2005a).

In South Africa, alcohol was found to be the third highest contributor to death and disability (Parry, 2007/8). Alcohol accounts for (6.5%) total deaths and (6.8%) of total DALYS (Schneider et al., 2007). A high proportion (46%) of mortality cases due to non-natural causes have had blood alcohol levels greater than or equal to the legal limit for driving, that is, 0.05 g/100 ml, (Matzopoulos, Seedat & Cassim, 2003). Research conducted in three large port cities in South Africa in 2001 found that 39% of trauma patients had blood alcohol concentrations greater than or equal to 0.05 g/100 ml (Pluddemann et al., 2003).

It was estimated that 20% of unintentional and 41% of intentional injuries were attributed to alcohol (Schneider et. al., 2007). In addition, to accidents and fatalities, alcohol has been associated with a range of risk behaviors, including, violence and high risk sexual behaviours. Alcohol-related problems also constitute the largest proportion of admissions to specialist substance treatment centres, routinely monitored by the South African Community Epidemiology Network on Drug Use (SACENDU) (Parry et al., 2002).

The burden of alcohol-related risk behaviours is clearly substantial, but does not preclude its effects on health for both men and women differently. Alcohol has been associated with a range of diseases, including, cirrhosis of the liver, cancer, diabetes and cardiovascular disease. However, the consequences on males and females are variable. In almost all instances, men have been disproportionally affected by chronic disease (Rehm et al., 2009). The health consequences for women are unique because of the biological makeup of women. This is because women tend to have lower body weights, smaller livers and higher proportion of fat to muscle. Women also have less water in their bodies than men. The more water available, the more diluted the alcohol (Baraona et al., 2001). Hence, women have higher concentrations of alcohol in their blood than adult men, given the same alcohol intake. Thus, even in small amounts, alcohol affects women differently than men.

In addition to having unique biological risk factors, women have an additional unique factor compared to men, primarily in relation to the opportunity to become pregnant. During pregnancy there is the development of a placenta which, feeds and nourishes the foetus while also disposing of toxic waste. Alcohol is able to pass easily through the placenta from the mother's bloodstream into the blood and tissues of the developing foetus and it is a common teratogen, resulting in birth defects called Fetal Alcohol Syndrome (NIAAA, 2008). FAS is worthy of further investigation and research, particularly regarding the health behaviours of women, given the detrimental effect that it has on a foetus.

CHAPTER 2: LITERATURE REVIEW

Multiple bibliographic databases, including EBSCOhost, PUBMED, WEB OF SCIENCE, Goggle Scholar, were used to develop a comprehensive review of the literature on knowledge of alcohol effects on pregnancy, Fetal Alcohol Syndrome and alcohol use. Selected keywords included *FAS, Health Belief Model (HBM), alcohol use, pregnancy, knowledge, risk and protective factors.*

Fetal Alcohol Syndrome

Fetal Alcohol Syndrome, the most recognized form of Fetal Alcohol Spectrum Disorders is the most severe effect of Alcohol Exposed Pregnancy (AEP) (Morojele et al., 2008). It is a preventable condition which has implications for lifetime physical and mental disabilities. FAS is characterized by particular physical and mental/neurological defects, abnormal facial features, reduced or slowed physical growth, a small head circumference, and slowed intellectual/behavioral development (Morojele et al., 2008). The latter defects are thought to be related to reduced or slowed development of the brain itself (NIAAA, 2008). The brain damage that occurs with FAS can result in lifelong problems with learning, memory, attention, and problem solving (NIAAA, 2008).

These alcohol-related changes in the brain may be present even in babies, whose appearance and growth are not affected. Damage to the nervous system, the brain, and spinal cord can occur in the first few weeks of pregnancy (see figure 1 below); before a woman even knows she is pregnant. Among, other risk factors, Fetal Alcohol Syndrome is associated with episodic binge drinking that produces high blood alcohol concentration (BAC) (May et al., 2008). This is particularly important in South Africa, where binge drinking patterns are relatively high and the patterns of binge drinking among women are not very different from that of men (Parry et. al., 2005). What is regrettable is that FAS is entirely preventable.

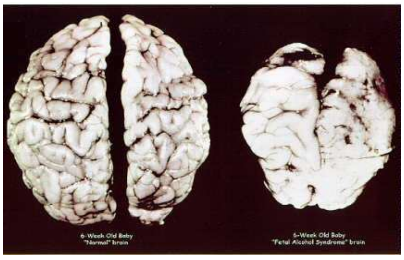
6weeks normal brain  6weeks brain damaged by alcohol

Figure 1: Brain damaged by alcohol (Clarren, 1996)

The preventable nature of FAS notwithstanding, various regions in South Africa have the highest rates of FAS in the world (Urban et al., 2008, May et al., 2000, Viljoen and Craig, 2003). The prevalence rates of 65.2-74.2/1000 (Viljoen et al., 2005) and 68.0-89.2/1000 (May et al., 2007) have been reported from rural communities in the Western Cape. Studies undertaken in Northern Cape and Gauteng province also found high prevalence rates, that is, overall prevalence of 67.2/1000 of FAS between the periods 2001 to 2006. Given the high rates of prevalence, studies are conducted in rural, farm areas, such as (Western Cape and Northern Cape), where *dop s*ystem (which involves the part payment of farm workers in poor quality of wine) used to be practiced. A further study was conducted in non-farming urban area of Gauteng.

In comparison to the Northern Cape region, Gauteng (urban area), had the estimates of median prevalence of FAS amongst first-graders from four schools ranging from 19/1000 to 26.5/1000 (Viljoen and Craig, 2003). Increasingly however, risky drinking has been found to be high among Urban dwellers, (Peltzer & Ramlagan, 2009), indicating that women of child-bearing age in rural areas are not the only ones affected by risky drinking and its associated risks, but that this increasingly applies to urban areas as well. Peltzer & Ramlagan, (2009) reported similar rates in Gauteng of FAS among Grade 1 learners to that of a wine growing region in the Western Cape.

Risks of FAS are associated with low socio-economic status (SES) and lower education attainment, often found largely in rural communities. There are other studies that have reported this association (Urban et al., 2008; May et al., 2005). However, the urban area has protective factors for FAS for instance higher educational levels and better SES. By implication then, women in the urban areas should have higher levels of *knowledge* of the alcohol effects on pregnancy, and hence be at a lower risk for FAS. This study aims to explore this relationship.

Health Belief Model (HBM)

The view that knowledge has a pivotal role to play in determining health behaviours has long been researched by theorists. Knowledge, defined as skills acquired by a person through experience or education, helps in the cognitive process. The present study is informed by the Health Belief Model (Rosenstock, 1966), a psychological model, that attempts to explain and

predict health behaviours. The HBM has four concepts: 1) susceptibility, (2) severity, (3) benefits minus costs and (4) health motive (Rosenstock, 1974) (see figure 2 below).

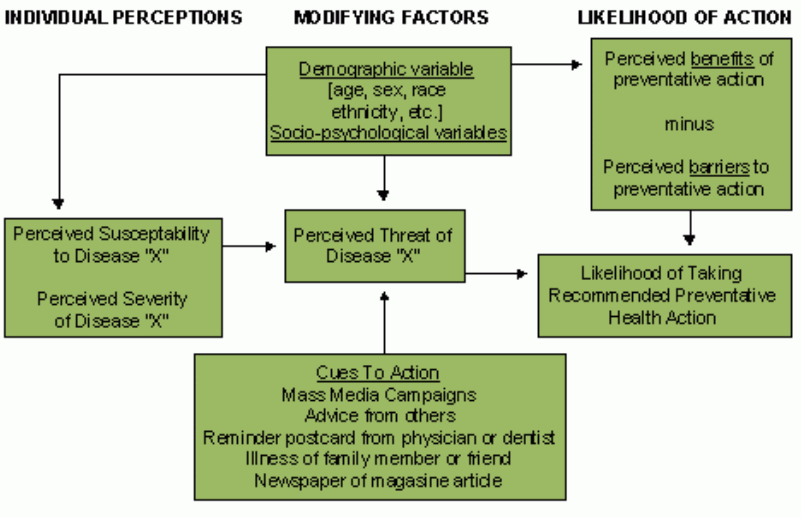


Figure 2: Health Belief Model Diagram (Bowes, 1997)

The model has been used in health education programs for prevention for instance, for safe sex intentions such as abstinence, safer sexual behaviors and condom use. A review paper illustrates that from the 54 studies that measured program impact on condom use, almost half (48%) of them showed increased condom use. According to Iriyama et al., (2007) the HBM has provided a useful conceptual framework for preventing risky sexual behaviors, especially in relation to condom use or reducing number of sexual partners.

As a predictive model of behaviours change, the HBM points to a person's low perceptions of risk as a reason to engage in risky behaviour. Therefore, for the purposes of this study, the researcher will look at the two concepts of the theory, which is susceptibility, i.e. a person believes that his or her health is in jeopardy; (2) severity, i.e. the person perceives the "potential seriousness" of the condition, in terms of pain or discomfort, or that getting the disease has negative consequences. According to a study that was conducted on male adolescent students in Nepal, the perceived severity of HIV/AIDS enhanced intention to abstain from sexual activities (Iriyama et al., 2007)

Applied to this study, the implication is that, for a person to change or avoid risks the person must *know* the consequences of a risky action and understand the perceived threat to the

health of their unborn child. Knowledge is thus seen as a mediating factor in the cognitive process. Hence, according to HBM, the knowledge about the effects of alcohol and perceptions about the risk for the unborn child is a critical factor influencing alcohol related health behaviour during pregnancy.

Khumalo (2008) concurs with the HBM by affirming that being informed (that is, having knowledge) about the effects of alcohol helps individuals make informed, responsible choices regarding drinking. Morojele et al., (2010) also report that knowledge about FAS (OR= 0.37, 95% CI= 0.20-0.70) and education (OR = 0.53, 95% CI= 0.30-0.94) were significant protective factors against alcohol use. According to Rendall-Mkosi et al., (2007) there is a link between a lack of knowledge regarding the detrimental effects of Pregnancy Alcohol Exposure (PAE) on the foetus as a result of possible FAS, and an increased risk of an AEP. This means the lack of knowledge about FAS puts the woman at risk of AEP and subsequently, puts the foetus at risk of FAS. According to Parry (2007/8), lack of knowledge about FAS is one of the risk factors for rural women. It is important to look at the urban area alone, with regard to knowledge about FAS, given the differing SES conditions, against the backdrop of other maternal risk factors such as age, race, education, marital status and reproductive health. These maternal risk factors for FAS have been identified in previous studies (May et al., 2008; Urban et al., 2008). For the purpose of this study only socio-demographic characteristics, knowledge levels, and alcohol use will be addressed.

Maternal Risk factors

Age is one of the socio-demographic characteristics influencing health behavioural change. Previous research investigating the relationship between age and FAS identified advanced maternal age as additional risk factors among women who give birth to children with FAS (Viljoen et al., 2002). According to Chambers et al., (2005) adolescents and younger women may be more likely to drink in pregnancy, but older women who drink heavily in pregnancy are more likely to give birth to a child with FAS (Kvigne et al., 2003). Prenatal alcohol use appears to be the highest in women older than 30 year (May et al., 2008). Therefore, drinking patterns among women based on their ages appear to impact on risk (Parry, 2007/8).

In terms of race, a household survey found that risk predictors of having an alcohol-exposed pregnancy for urban women were, being Coloured or White as opposed to being Black/African (Parry, 2007/8). However, there is trend that Black/African women, especially

adolescents are increasingly using alcohol. A study by Parry, (2005a) confirms that there is an increase in current drinking and in life-time drinking among young, Black/African women. This could be the result of easy access to alcohol in both urban and rural areas or low attainment of education.

Several studies have reported that women with less than high school education are prone to use alcohol while pregnant (Meschke et al., 2008; May et al., 2008; Morojele et al., 2010). This suggests that high education is a protective factor against prenatal alcohol use. On the contrary, a study conducted in the United States (US) showed that a greater percentage of pregnant women with at least some college education (11%) or a college degree or more (14.4%), reported more alcohol use than pregnant women with a high school diploma or less (8.5%) [AORs = 1.4 and 1.9, respectively] (Denny et al., 2009). It is interesting to note that in this cohort, high education increased alcohol use. However, consideration is given to the vastly different socio-economic and cultural contexts of the two studies.

Singleness (unmarried) is also a risk factor for FAS (Meschke et al., 2008; May et al., 2008). Heavy drinking has been seen to be common among women who have never been married, cohabiting, or are divorced or separated (Rendall-Mkosi et al., 2008). The effect of divorce on a woman's later drinking may depend on whether she is already drinking heavily in her marriage. A woman whose husband drinks heavily is also more likely than other women to drink (NIAA, 2008).

Several studies concur with singleness being a risk factor to patterns of alcohol use including a study conducted in the developed country (US). According to Denny et al. (2009), a greater percentage of unmarried pregnant women (3.6%) reported binge drinking than married pregnant women. In South Africa, more married pregnant women reported binge drinking (1.1%, AOR = 4.4%) than single pregnant women (Parry, 2005a). According to Parry (2005a), binge drinking means having five or more drinks on one or more days. Binge drinking is particularly harmful to fetal brain development (Mattison and Riley, 1998). Thus one heavy bout of drinking may be enough to cause FAS (FARR, 2005). This pattern of drinking is common in urban areas. According to Peltzer and Ramalagan, (2009) higher binge drinking levels were found for women (12%) in urban and (9%) in rural. Therefore, it is important that the study looks at patterns of drinking among urban women of childbearing age.

Gravidity and parity are reproduction health indicators that are either risk or protective factors for FAS. Gravidity is defined as the number of times that a woman has been pregnant and parity is defined as the number of times that she has given birth to a foetus with a gestational age of 24 weeks or more, regardless of whether the child was born alive or was stillborn (Borton, 2009). Risk for FAS is associated with higher gravidity and parity. On the other hand, low gravidity and parity were found to be key protective factors for FAS (May et al., 2005).

Understanding what impacts on alcohol use in general and in pregnancy among Urban South African women, requires an exploration of several key factors. In doing so, the relationship between knowledge of alcohol effects on pregnancy, and key socio-demographic factors on the consumption of alcohol among both generally and in pregnancy, will be examined in the following chapters.

Statement of the problem

Despite higher comparative levels of FAS in rural areas, in South Africa, almost one third of the population, in an urban site in Gauteng demonstrates that FAS is not exclusively a problem of rural areas in South Africa. Even though, the women in the urban area are likely to be more educated, there is still prevalence of FAS, (Morojele et al., 2008). While the prevalence of AEP pregnancies and their related conditions have been well established in rural sites, there is limited research on urban areas. The significantly high FAS statistics in South Africa could suggest that a considerable gap exists in the knowledge of effects of alcohol on pregnancy and alcohol use. Thus a study investigating the nature of the relationship between knowledge of effects of alcohol on pregnancy and actual alcohol use during pregnancy is timely.

Aims and Objectives of the study

AIMS

The aim of the study is to explore the relationship between knowledge of alcohol effects on pregnancy and alcohol use generally, and in pregnancy, among urban women (18-44 years) in the Tshwane Municipality during the period 2006.

OBJECTIVES

- To determine the knowledge levels of a sample of women (18-44 years) concerning alcohol effects on pregnancy
- To describe the sample ‘s socio-demographic profile in respect of age, education, race, reproductive health (parity, miscarriage and pregnancy outcome), marital status and socioeconomic status
- To determine prevalence of lifetime and current alcohol use among all women in the sample
- To determine prevalence of alcohol use during pregnancy
- To investigate the association between socio- demographic profile and knowledge levels and alcohol use during pregnancy

CHAPTER 3: METHODOLOGY

This chapter describes the research methodology used to conduct this study. The methods ethical considerations and analytic techniques pertaining to this study are also dealt with in this chapter.

Study sample

Secondary data analysis was conducted on data collected from a cross-sectional household survey undertaken in the Tshwane Municipality, (Gauteng province) during the period 2006. The primary study population consisted of 606 women aged between 18 and 44 years. The entire sample was included in this sub-study. The site, located within Gauteng province had a population estimate of 340,000. The site is highly industrialized and alcohol is widely available through legal and illegal outlets. In proportion to the distribution of demographic groups within the country, as well as that province in the period 2006, Black/African women comprised the major race group in the sample.

As this study employed secondary data analysis, permission to use the data was obtained in writing from the principal investigator and co-principal investigator of the primary study (See Appendix 1). Ethical approval to conduct these analyses was obtained from the HREC (Human Research Ethics Committee-M10105) at the University of the Witwatersrand (see Appendix 3).

In the secondary data analysis, general ethical principles of anonymity were upheld by storing data in the form of case identification, without names or other identifying information. In addition, results are reported as group results, in order to protect any identifying information.

Measures

The following measures were used in the analysis for this study:

Knowledge of alcohol effects on pregnancy: The knowledge variable comprised two components. The first component was a single response question asking “Does the drinking of alcohol during pregnancy have any effect on the unborn foetus? Responses were coded as No (0), Yes/sometimes (1), Do not know (2). The second component of the knowledge variable comprised knowledge about specific alcohol effects in pregnancy. The following subscales were used to measure knowledge about alcohol effects in pregnancy: physical growth, special facial features, speech problems, intelligence ability, learning problem, social integration and behavioural problems. The subscales showed acceptable internal

consistencies, the average of which was 0.89. The knowledge levels were computed as follows: All the missing values of the subscales were counted. The overall score sum was determined by summing up the values of subscales to generate a score between 0 and 7. The overall score average was determined by dividing the sum by 7. The overall score sum was categorised into 3 quartiles (<25%, >25% < 75%, >75%) creating 3 knowledge levels. The knowledge levels of FAS were computed such that the score 1 indicates lower level of knowledge (i.e. less than or equal to two questions) score 2 indicates medium level of knowledge (i.e. three to five questions) and score 3 indicates higher level of knowledge (i.e. six to seven questions).

The acceptable internal consistencies provide support for the rationale of using different domains to measure knowledge about alcohol effects in pregnancy. The knowledge domains were created as follows: Physical setback (1), social setback (2) and mental setback (3). The physical setback includes the following variable: physical growth, special facial features and speech problems. Social setback was comprised of social integration and behavioural problems, and for mental setback, intellectual ability and learning problems was used as variables. The internal consistencies for the three domains were 0.76, 0.70 and 0.75 respectively. This means there is correlation between the variables within the domains. The domains were computed as follows: All the missing values of the physical, social, mental domains were counted. The overall score sum of each domain was determined by summing up the values to generate a score between 0 and 3 for physical setback and score between 0 and 2 for social and mental setback. The overall score average for each domain was determined by dividing the sum by 3 or 2. The overall score sum was categorised into No =0 (if score sum <1) and Yes =1 (if score >=1 & >=3 or >=2).

Socio-demographic profiles: The age variable was re-coded from a numerical variable into a categorical variable to make up the following categories: (18-24 years) (=1), (25-34 years) (=2) and (35-44 years) (=3), based on the fact that younger and older women may face varying physical and social risks. Race was categorized as Black/African (1), Coloured (2), White (3), Asian/Indian (4). Education level was re-coded into three categories: primary (Grade 1-7 & less than year) (=1), Secondary (grade 8-12) (=2) and tertiary (degree, diploma etc.) (=3). Marital status was categorized into married/cohabitation (=1), single/never married (unmarried) (=2) and divorced/widow/separate (not living together with partner) (=3).

Employment status: The employment status was re-coded into three categories: unemployed (0) employed (full-time/ part-time) (1), self-employed (2).

Socio-Economic Status: The socio-economic status (SES) of respondents was assessed by means of an asset indicator. The asset indicator is a crude measure that will be used as a proxy for SES. Previous studies have validated the use of an asset indicator score, as a proxy for SES (Barbarin and Khomo, 1997). For this study, indicator scores were derived from respondents' self-reported answers to a series of questions on their household's ownership of the following eight household assets and commodities: electricity, radio, television, telephone, fridge, computer, washing machine and cell phone. A Cronbach's alpha was conducted to determine the internal reliability, the average was 0.70. Responses were coded as a No (0) or Yes (1) and summed using equal weights to generate a score between 0 and 8. Subsequently, three categories of SES were created. Anyone reporting less than zero and between two possessions was regarded as low socio-economic status (SES) and coded (0). Anyone reporting three to five possessions was regarded as middle socio-economic status (SES) and coded (1). Any one reporting six and more possessions was considered high socio-economic status (SES) and coded (2).

Reproductive history: The reproductive health was categorized into parity, miscarriage and pregnancy outcome. The respondents were categorized as follows: who indicated not given birth was coded (=0), having 1 to 3 children was coded (=1) and indicated low parity, 4 to 6 children coded (=2) indicated middle parity and 7 to 10 children coded (=3) indicated high parity. Miscarriage was categorized into four categories: none (=0), 1 to 4 miscarriage (=1) and 5 or more miscarriage (=2). Pregnancy outcome was coded into five categories: full-term (1), pre-term (2), stillborn (3), voluntarily terminated pregnancy (4) and miscarriage (5).

Alcohol use: The alcohol use measure was divided into lifetime alcohol use (ever had a drink containing alcohol), current alcohol use (past month). The codes for lifetime alcohol measures were subscribed to the standard coding of No (0) and Yes (1). The current alcohol use was coded as not taken any drink in the past month (=0), 1 to 31 days (=1).

Alcohol use during pregnancy: The pregnancy status of the women was categorised into not pregnant (0), pregnant (1) and do not know (2). Last pregnancy status variable was coded: 0 to 1 year (=1), 2 to 5 years (=2) and greater than 5 years (=3). The variable, alcohol use

during pregnancy was computed from the question "after you knew that you were pregnant, how often did you have a drink containing alcohol". The variable was categorised into two categories: never used (0) and used (monthly or less, 2 to 4 times a month, 2 to 3 times a week, 4 or more times a week) (=1).

Pattern of alcohol use pre-pregnancy and during pregnancy: the pattern of alcohol use was classified 3 months before pregnancy (pre-pregnancy) and after the knowledge of pregnancy (during pregnancy). The variables included frequency of use, days on which they drank and number of drinks. Dummy variables were created to show frequency of use before pregnancy: Never (0), monthly (Monthly or less, 2 to 4 times a month) (=1), weekly (2 to 3 times a week) (=2), daily (4 or more times a week) (=3). The variable about the days when alcohol was used were categorised: Never (0), Sometimes (1), weekdays (2), weekends (3) and both (weekdays and weekends) (=4). The amount of drinks was computed and coded as none (0), 1 to 5 drinks (1), 5 to 10 drinks (2) and 10 or more drinks (3). These variable was the computed the same for alcohol use during pregnancy.

Procedure

Following approval by principal and co-principal investigators of the primary study and the institutional ethics committee, the researcher explored the raw data, through descriptive analyses and began extracting required variables to answer the question of the sub-study. Thereafter a code list (see Appendix 2) was compiled. The following dependent and independent variables were identified, and either recoded or computed, as detailed above, to meet the aims and objectives of the study:

Independent variables

Knowledge of alcohol effects on pregnancy, Socio-demographic profile

(Age, race, marital status, education, employment status, SES and reproductive health)

Dependent variables

Lifetime Alcohol use

Current alcohol use

Alcohol use pre-pregnancy and during pregnancy

Data was analyzed using statistical software package STATA (version 11). The variables were re-coded into categorical variables where a number represented a category (e.g. male = (1), female = (2).

Analysis

Univariate analysis was done on both the independent and dependent variables to provide a summary of knowledge of alcohol effects, alcohol prevalence, and alcohol use during pregnancy. Simple frequencies were used to calculate the frequencies of each of the socio-demographic characteristics.

Bi-variate analysis was conducted to show relationship between two variables (Knowledge and alcohol use, AND socio-demographic profile and alcohol use). Pearson chi-squared test (χ^2 test) was used to determine the relationship (association) between two categorical variables (socio-demographic variables and alcohol consumption). Fischer exact test was used for variables that had an expected frequency of five or less. The odds ratios were used to determine the strength of the association. The statistical significance was calculated at 95% confidence interval.

CHAPTER 4: RESULTS

This chapter contains the results from univariate analysis by describing the frequencies of socio-demographic characteristics, knowledge about FAS, and alcohol use in general and during pregnancy, by a sample of urban women. Thereafter bivariate analysis was conducted using the Pearson chi-squared and Fischer exact test to determine the relationship between socio-demographic variables, knowledge about FAS, current use and use of alcohol during pregnancy.

Socio-demographic profile

Table 1 below shows that (30%) of the women in the sample, were in age group 18-24 years (young adults), (38%) in age group of 25-34 years (adults), and (32%) in the age group of 35-44 years (older adults). These age groups are based on the fact that younger and older women may face varying physical and social risks. The majority of women were Black/African (81%), in keeping with the racial distribution of Tshwane municipality in 2006. Eleven percent were Coloured and (7%) were White. There was only one Indian woman in the study sample, and were excluded from further analysis. In terms of educational level, (8%) of the women in the study had primary education, while the majority (78%) had secondary education (grade 8-12). The remaining (14%) had tertiary education.

In terms of marital status, (36%) of the women reported that they were married (either legally, traditionally or cohabiting). Fifty nine percent were unmarried, (either single or never married). The remaining (5%) of the women indicated that they were either separate or divorced (and not living with their partners).

Fifty eight percent of the sample was unemployed, while (40%) were employed either in part-time or full-time employment; and (2%) were self employed. In terms of SES levels (47%) of the women in the sample had higher SES level (more than 6 items), (36%) of the women had medium SES level and (15%) had lower SES level. Two percent was missing values.

In terms of reproductive health (comprised of parity, miscarriages and pregnancy outcomes), table 1 below shows that (24%) of the women in the study had no children. Half of the sample (50%) had between one to three children, and (25%) had between four to six children. The remaining one percent, reported to have seven and more children. Fifteen percent of the respondents had between 1 to 4 miscarriages, while (81%) had no miscarriages. Two percent

had between 5 or more miscarriages and the other (2%) was missing values. In terms of pregnancy outcome (66%) of the women in the study had full-term pregnancies, (7%) had pre-term pregnancy and (2%) had miscarriages. Less than zero percent of the women reported voluntary termination of pregnancy and (1%) still birth. The remaining (24%) were for missing values.

Table 1: Socio-demographic profile of 606 urban women of childbearing age

	N (606)	**%**
Age (years)		
18-24	182	30.0
25-34	230	38.0
35-44	194	32.0
Race		
Black/ African	491	81.3
Coloured	67	11.1
White	45	7.4
Indian	1	0.2
Education		
Primary (Less than one year completed & Grade 1-7)	47	7.8
Secondary (Grade 8-12)	469	77.6
Tertiary (degree, diploma, further studies incomplete)	88	14.6
Marital status		
Married (legal/traditional married/co-habitation)	221	36.5
Unmarried (single/never married)	355	58.7
Not living together (divorced/widow/separate)	29	4.8
Employment status		
Unemployed	351	58.1
Employed (part-time/ full-time)	241	39.9
Self-employed	12	2.0
SES level		

Lower	91	15.0
Medium	221	36.5
Higher	283	46.7
Missing	11	1.8
Reproductive health		
Parity		
None	143	23.6
1-3 children	301	49.7
4-6 children	155	25.6
7-10 children	4	0.7
Missing	3	0.4
Miscarriage		
None	491	81.0
1- 4	93	15.3
5 or more	10	1.7
Missing	12	2.0
Pregnancy outcome		
Full-term	402	66.3
Pre-term	40	6.6
Still-born	8	1.3
Voluntarily terminated pregnancy	1	0.2
Miscarriage	9	1.5
Missing	146	24.1

Knowledge about alcohol effects on unborn foetus

In terms of knowledge regarding alcohol effects on an unborn foetus, (83%) of women in the total sample reported that drinking alcohol during pregnancy can affect the unborn foetus. Four percent reported that drinking alcohol during pregnancy has no effect on the unborn foetus, while the remaining (7%) reported that they did not know the effects. Six percent was missing values.

The results from the question on the effects of alcohol in pregnancy were categorised into physical (physical growth, special facial features and speech problems), mental (intelligence ability and learning problems) and social (social integration and behavioural problem) setbacks. According to table 2 below (72%) of the women reported that alcohol use can result in physical setbacks, while (15%) said the child would not have physical setbacks. Thirteen percent were missing values. Sixty seven percent reported that alcohol use in pregnancy can result in mental setbacks and (23%) said that it did not. The remaining (10%) were missing values. Fifty three percent of the women reported that alcohol can result in social setbacks.

The results show that (33%) of the study sample reported that alcohol use will not result in social setback. The remaining (14%) was missing values.

The same question on the effects of alcohol on pregnancy was used to determine the levels of knowledge about FAS. The findings show that (35%) of the women had higher on knowledge about FAS. The results indicate that (19%) had medium levels of knowledge and (31%) had lower levels of knowledge about FAS. The remaining (15%) were missing values.

Table 2: Knowledge about alcohol effects on unborn foetus among urban women

	N (606)	**%**
Does drinking during pregnancy have any effect on the unborn foetus?		
No	22	3.6
Yes/ sometimes	506	83.5
Don't know	42	7.0
Missing	36	5.9
In what ways can a baby be affected if the mother drinks during pregnancy? Knowledge Categories		
Physical setback		
No	93	15.3
Yes	436	72.0
Missing	77	12.7
Cronbach's alpha	0.76	
Mental setback		
No	138	22.8
Yes	405	66.8
Missing	63	10.4
Cronbach's alpha	0.75	
Social setback		
No	198	32.7
Yes	227	53.1
Missing	86	14.2
Cronbach's alpha	0.70	
Knowledge level		
Cronbach's alpha	0.89	
Low	208	34.3
Medium	217	36.0

High	162	26.7
Missing	19	3.0

Alcohol use

Forty percent of the total sample (N=605) reported have ever had a drink containing alcohol in their lifetime, while the remaining, (60%) percent had no lifetime use of alcohol. Past month (current use, N=161) findings show that the majority of women had used alcohol (75%) in the past month, (25%) had not used alcohol in the past month.

Table 3: Lifetime and current alcohol use by women of childbearing age

	N=606	**%**
Alcohol use		
Lifetime use (N=605)		
No	361	59.7
Yes	244	40.3
Current use (past month use)	**N=161**	
No	40	24.8
Yes	121	75.2
Pregnancy use (N=50)		
No	34	68.0
Yes	16	32.0

Pregnancy Status

Table 4 below reveals that (5%) of the total sample indicated that they were currently pregnant. Seventy one percent of the total sample was not pregnant and one percent did not know their pregnancy status. In terms of pregnancy history, thirty one percent of the women were last pregnant more than five years prior to the survey, (23%) were last pregnant between 2 and 5 years were while, (22%) were last pregnant in the previous year. The remaining (24%) were missing data.

Table 4: Pregnancy status of women during the study

	N (606)	%
Pregnancy status		
Not pregnant	432	71.3
Pregnant	29	4.8
Do not know	5	0.8
Missing	140	23.1
Last pregnancy		
0-1 year	135	22.3
2-5 year	137	22.6
> 5 year	188	31.0
Missing	146	24.1

Alcohol use 3 months pre- pregnancy

This section of the results used only the subsample of women who were pregnant. This reduced the denominator significantly from 606 to 29 women. The use of alcohol by this subsample of women 3 months before they were pregnant, and after they knew they were pregnant was determined by the frequency of use, days on which they drank, and number of drinks. Three months before they were pregnant, (58%) of the women used alcohol monthly, (11%) used alcohol weekly and (6%) used daily, while the remaining, (25%) did not use alcohol at all in the 3 months preceding their pregnancy.

Table 5 below, which shows the pattern of drinking 3 months pre- pregnancy, reveals that (36%) of women drank sometimes. However, there is a clear differential in the pattern of drinking by weekdays and weekends, whereby, (34%) of pre-pregnant women drank on weekends, while (4%) drank on weekdays. Nine percent drank on both weekdays and weekends and the remaining (17%) never drank alcohol. In terms of the amount of alcohol use 3 months before pregnancy, (58%) women drank between one to four drinks (6%) drank between five to nine drinks and (6%) consumed ten or more drinks. Thirty percent of the women had not taken any drink containing alcohol in past 3 months prior to pregnancy.

Alcohol use in Pregnancy

The results from table 5 below show that the majority of women did not use alcohol in pregnancy (68%), while (24%) used alcohol monthly, (6%) used alcohol weekly and the remaining (2%) used alcohol daily. As with alcohol use pre-pregnancy, there differential in

the pattern of drinking by weekdays and weekends, remains. Firstly, the majority of women (67%) indicated that they did not drink. Eleven percent of women indicated that they drank sometimes, (10%) drank on weekends, as opposed to (6%) indicated that they drank on weekdays. The remaining (6%) used alcohol on both weekdays and weekends after they knew they were pregnant Examining the amount of alcohol the women had after they knew they were pregnant revealed that (26%) of the women consumed one to four drinks containing alcohol, (6%) reported drinking five to nine drinks during pregnancy. The remaining (68%) did not use alcohol in pregnancy.

Table 5: Alcohol use during pregnancy by women of childbearing age

Frequency of use before pregnancy		
Often (N=48)		
Never	12	25.0
Monthly	28	58.3
Weekly	5	10.4
Daily	3	6.3
Days on which alcohol was drunk (N=47)		
Never	8	17.0
Sometimes	17	36.2
Weekdays	2	4.3
Weekends	16	34.0
Weekdays & Weekends	4	8.5
Amount (N=50)		
None	15	30.0
1-4 drinks	29	58.0
5-9 drinks	3	6.0
10 or more drinks	3	6.0
Frequency of use during pregnancy		
Often (N=50)		
Never	34	68.0
Monthly	12	24.0
Weekly	3	6.0
Daily	1	2.0
Days on which alcohol was drunk (N=48)		
Never	32	66.7
Sometimes	5	10.5
Weekdays	3	6.2
Weekends	5	10.4
Weekdays & Weekends	3	6.2

Amount (N=47)		
None	32	68.1
1-4 drinks	12	25.5
5-9 drinks	3	6.4
10 or more drinks	-	-

Association between socio-demographic profile and current alcohol use

The association between socio-demographic variables and current use was determined by Pearson chi-squared (and Fisher exact) test. Fischer exact test was used where the contingency tables had small sample sizes and one of the cells in the table had a zero or less than five in it. The strength of the association was shown by unadjusted odds ratio, and 95% confidence interval.

Table 6 below shows that (74%) of women in the 18-24 age group were current alcohol users, while (26%) had not used alcohol in the past month. Of the women in the 25-34 age group (75%) had used alcohol in the past month, while (25%) did not. Among the women in the 35-44 age group (77%) were past month users of alcohol, compared to (23%) who abstained. Odds ratio for 25-34 and 35-44 age groups were (OR = 1.1, CI = 0.45-2.51; OR=1.2, CI =0.50-3.04) respectively. Though there was no statistical significance (p=0.89), this implies that the women in these age groups are more likely to use alcohol in the past month than women in the young adult group (18-24 years).

In terms of race, (80%) of Black/African women were past month alcohol users, compared to (20%) who had not used alcohol in the past month. Among the Coloured women (71%) had used alcohol in the past month, while (29%) had not. Of the White women (68%) were current alcohol users, (32%) were not. Black/ African women were more likely to use alcohol in the past month as compared to Coloured (OR = 0.6, CI= 0.27-1.41) and White women (OR=0.7, CI=0.52-1.31), although there no statistical significance (p= 0.30). This is likely to be a result of the fact that Black African women made up the majority of the sample.

Table 6 below shows that of the women with primary education (83%) were past month users, (17%) had not used alcohol in the past month. Of the women who had secondary education (77%) were past month users of alcohol, while (23%) were not. Among the women with tertiary education, (68%) had used alcohol in the past month, while (32%) had

not. The odds ratio for women with secondary and tertiary education were (OR= 0.6, CI=0.07-5.83) and (OR= 0.4, CI=0.04-4.09) respectively. This suggests that women with secondary and tertiary education were less likely to use alcohol in the past month, than the women with primary education. There was no statistical significance between the education and current alcohol use (p= 0.57).

The results show that (72%) of married women used alcohol in the past month and (28%) abstained. Seventy seven percent of unmarried women were current users of alcohol compared to (23%) who abstained. Of the women not living together with their partners (77%) were current alcohol users, while (23%) were no. Although, there was no statistical significance between the marital status and current alcohol use (p= 0.83), the odds ratio for unmarried women was (OR=1.3, CI=0.58-2.7) and women not living with their partners (OR=1.3, CI=0.35-4.54) respectively, implying that unmarried women and women not living with partners were more likely to use alcohol in past month than the married women

Seventy percent of the unemployed women were current users of alcohol, while (30%) were abstainers. Among the employed women (80%) had used alcohol in the past month, (20%) did not. All the self–employed women did not use alcohol in the past month. There was almost statistical significance between the employment status and current alcohol use (p=0.06). The results show that there was an association between employed women and current alcohol use (OR = 1.78, CI= 0.86 – 3.70). This means employed women were more likely to use alcohol in the past month than unemployed women.

Of the women with lower SES (83%) had used alcohol in the past month, compared to (17%) who did not. Seventy six percent of the women with medium SES were current alcohol users, while (24%) were abstainers. Among the women with higher SES (74%) had used alcohol in the past month, while (26%) abstained for past month alcohol use. An odds ratio for medium (OR = 0.64, CI=0.06-6.04) and higher SES level was (OR = 0.58, CI=0.06-5.17), suggesting that women with medium and higher SES are less likely to use alcohol in the past month than the women with lower SES. However, there was no statistical significance between the SES level and current alcohol use (p= 1.00).

Of the women with no children (77%) had used alcohol in the past month, compared to (23%) who did not. Seventy one percent of the women with 1 to 3 children were current

alcohol users, while (29%) were abstainers. Among the women with 4 to 6 children (83%) had used alcohol in the past month, while (17%) abstained. All the women with 7 to 10 children (100%) had used alcohol in the past month. An odds ratio for women with 1 to 3 children was (OR = 0.7, CI= 0.31- 1.67), suggesting that they were less likely to be current users of alcohol and women with 4 to 6 children were more likely to use alcohol in the past month (OR=1.5, CI=0.45-4.84) than women with no children. However, there was no statistical significance between the parity and current alcohol use (p= 0.53).

The results show that (78%) of women who had no miscarriages had used alcohol in the past month and (22%) abstained. Sixty nine percent of the women who had 1 to 2 miscarriages were current users of alcohol compared to (31%) who abstained. Among the women who had 3 or more miscarriages (60%) were current users of alcohol, while (40%) did not. Although, there was no statistical significance between the miscarriage and current alcohol use (p= 0.31), the odds ratio for women with one to two and three or more miscarriages were (OR=0.6, CI=0.26-1.46 and OR=0.4, CI=0.07-2.65) respectively. This implies that women with one to two and three or more miscarriages were less likely to use alcohol in past month than the women who had no miscarriage.

Table 6 below shows that of the women who had full-term pregnancy outcome (74%) were past month users, (26%) had not used alcohol in the past month. Of the women who had pre-term pregnancy outcome (92%) were past month users of alcohol, while (8%) were not. Among the women who had still-birth, (25%) had used alcohol in the past month, (75%) abstained. All the women who had voluntarily termination of pregnancy were current alcohol users. There was statistical significance between the pregnancy outcome and current alcohol use (p= 0.05). The odds ratio for pre-term pregnancy outcome had shown strong association (OR= 4.22, CI=0.52-34.17) with current alcohol use than full-term pregnancy outcome. The odds ratio for still-born was (OR= 0.11, CI= 0.01-1.18). This implies that women who had pre-term pregnancy outcome were more likely to be current users of alcohol and women who had still-birth were less likely to use alcohol in the past month compared to women who had full-term pregnancy.

Table 6: Association between socio-demographics profile and current alcohol use

	Current Alcohol Use (N)		**P-value**	**OR (95% CI)**	**P-value**
Age % (N)	No	Yes	0.89**		0.89
18-24	26.5% (13)	73.5% (36)		1 (Reference)	
25-34	25.4% (15)	74.6% (44)		1.06 (0.45 – 2.51)	0.90
35-44	22.6% (12)	77.4% (41)		1.23 (0.50 – 3.04)	0.65
Race % (N)			0.30**		0.30
Black/ African	19.7% (16)	80.3% (65)		1 (Reference)	
Coloured	28.6% (14)	71.4% (35)		0.61 (0.27 – 1.41)	
White	32.3% (10)	67.7% (21)		0.71 (0.52 – 1.31)	
Education % (N)			0.57*		0.54
Primary	16.7% (1)	83.3% (5)		1 (Reference)	
Secondary	23.4% (29)	76.6% (95)		0.65 (0.07 – 5.83)	0.70
Tertiary	32.3% (10)	67.7% (21)		0.42 (0.04 – 4.09)	0.45
Marital status % (N)			0.83*		
Married	28.0% (14)	72.0% (36)		1 (Reference)	
Unmarried	23.4% (22)	76.6% (72)		1.27 (0.58 – 2.7)	0.54
Not living together	23.5% (4)	76.5% (13)		1.26 (0.35 – 4.54)	0.72
Employment status % (N)			0.06*		
Unemployed	29.9% (23)	70.1% (54)		1 (Reference)	
Employed	19.3% (16)	80.7% (67)		1.78 (0.86 – 3.70)	
Self-employed	100% (1)	0.0% (0)			
SES level			1.00*		

% (N)					
Low	16.7% (1)	83.3% (5)		1 (Reference)	
Medium	23.9% (11)	76.1% (35)		0.64 (0.06 - 6.04)	0.69
High	25.7% (27)	74.3% (78)		0.58 (0.06 – 5.17)	0.62
Reproductive health% (N)					
Parity **% (N)**			0.53*		
None	22.7% (10)	77.3% (34)		1 (Reference)	
1-3 children	29.1% (25)	70.9% (61)		0.71 (0.31 – 1.67)	
4-6 children	16.7% (5)	83.3% (25)		1.47 (0.45 – 4.84)	
7-10 children	0.0% (0)	100% (1)			
Miscarriage **% (N)**			0.31*		
None	22.0% (27)	78.0% (96)		1 (Reference)	
1- 2	31.2% (10)	68.8% (22)		0.62 (0.26 – 1.46)	
3 or more	40.0% (2)	60.0% (3)		0.42 (0.07 – 2.65)	
Pregnancy outcome % (N)			**0.05*** +		0.03
Full-term	26.0% (25)	74.0% (71)		1 (Reference)	
Pre-term	7.7% (1)	92.3% (12)		4.22 (0.52 – 34.17)	
Still-born	75.0% (3)	25.0% (1)		0.11 (0.01 – 1.18)	
Voluntary termination pregnancy	0.0% (0)	100% (2)			

*Fischer's exact test
**Chi-squared test

Association between knowledge about FAS and current alcohol use

Table 7 below shows that all the women with no knowledge about alcohol effects on an unborn foetus, were past month alcohol users (100%). Of the women with knowledge about alcohol effects on an unborn foetus, (73%) were current users of alcohol, while (27%) were

abstainers. Of the women who did not know about alcohol effects on unborn foetus were 100% current users of alcohol. There was almost statistical significance between the knowledge about alcohol effects on unborn foetus and current alcohol use (p= 0.08).

The results show that (78%) of the women with lower knowledge were past month alcohol users, compared to (22%) who abstained. Among the women with medium knowledge (75%) had used alcohol in the past month, while (25%) had not. Of the women with higher knowledge (71%) were current alcohol users, (29%) were not. The strength of the association for the women with medium knowledge level was (OR= 0.82, CI =0.34-1.95) and for higher knowledge level (OR=0.68, CI= 0.25-1.84). This implies that women with medium and higher knowledge level were less likely to use alcohol in past month than the women with lower knowledge. There was no statistical significance between the knowledge level and current alcohol use (p= 0.75).

Table 7: Association between knowledge about the effect of alcohol use during pregnancy and current alcohol use

	Current Alcohol Use (N)		**P-value**	**OR (95% CI)**	**P-value**
Knowledge question % (N)	No	Yes	0.08*		0.53
No	0.0% (0)	100% (9)			
Yes	27.2% (40)	72.8% (107)		0.67 (0.19 - 2.36)	
Don't know	0.0% (0)	100% (5)			
Knowledge Level % (N)			0.75**		0.58
Lower	21.7% (10)	78.3% (36)		1 (Reference)	
Medium	25.3% (19)	74.7% (56)		0.82 (0.34-1.95)	
Higher	29.0% (11)	71.0% (27)		0.68 (0.25-1.84)	

*Fischer's exact test
**Chi-squared test

Association between socio-demographic profile and alcohol use during pregnancy

Table 8 below shows that (37%) of women within the 18-24 age group were users of alcohol during pregnancy, (63%) were not. Of the women in the 25-34 age group (41%) had used

alcohol during pregnancy, while (59%) did not. Among the women in the 35-44 age group (20%) were users of alcohol during pregnancy, compared to (80%) who not users. The women in age group 25-34 (OR= 1.1, CI=0.22-6.10) are more likely to use alcohol during pregnancy and women in age group 35-44 years (OR = 0.42, CI=0.07-2.53) are less likely to use alcohol during pregnancy than women in the age group 18-24 years. However, there was no statistical significance between age and alcohol use during pregnancy (p=0.31).

The results show that (41%) of Black/African women were users of alcohol during pregnancy, compared to (59%) of the remaining Black women in the sample, abstained. Among the Coloured women (33%) had used alcohol in pregnancy, while (67%) had not. Of the White women (10%) were users of alcohol during pregnancy, (90%) were not. Although, there was no statistical significance (p= 0.26), the Coloured (OR= 0.72, CI=0.20-2.64) and White (OR=0.16, CI=0.02-1.50) women were less likely to be users of alcohol in pregnancy than their Black/African counterparts. However, this may also be a reflection of the overwhelming majority of Black African women in the sample.

The findings below shows that of the women with primary education (20%) were users of alcohol during pregnancy, (80%) were abstainers. Of the women who had secondary education (35%) were users of alcohol during pregnancy, while (65%) were not. Among the women with tertiary education, (20%) had used alcohol during pregnancy, while (80%) did not. The odds ratio for tertiary education was (OR= 1.0, CI =0.04-21.17) and secondary education (OR= 2.1, CI=0.04- 22.17) was strongly associated with alcohol use during pregnancy. This implies that women with secondary education are more likely to use alcohol during pregnancy than women with primary education. There was no statistical significance between the education and alcohol use during pregnancy (p= 0.76).

The results show that (36%) of married women used alcohol during pregnancy and (64%) abstained. Thirty percent of unmarried women were users of alcohol during pregnancy compared to (70%) who abstained. Of the women not living together with their partners (20%) were users of alcohol during pregnancy, while (80%) were not. The odds ratio for unmarried women were (OR= 0.76, CI=0.22-2.65) and women not living with their partners (OR= 0.43, CI=0.04-4.62), respectively. This implies that unmarried women and women not living with their partners were less likely to use alcohol during pregnancy than the married

women. However, there was no statistical significance between the marital status and alcohol use during pregnancy (p= 0.83).

Thirty eight percent of the unemployed women were users of alcohol during pregnancy, while (62%) were abstainers. Among the employed women (25%) had used alcohol during pregnancy, (75%) did not. One hundred percent of self–employed women abstained from alcohol during pregnancy. The odds ratio for employment status was (OR = 0.50, CI= 0.15-1.65), suggesting that employed women were less likely to use alcohol during pregnancy, than the unemployed women. There was no statistical significance between the employment status and alcohol use during pregnancy (p= 0.57).

Of the women with lower SES (40%) had used alcohol during pregnancy, compared to (60%) who did not. Thirty one percent of the women with medium SES were users of alcohol during pregnancy, while (69%) were abstainers. Among the women with higher SES (32%) had used alcohol during pregnancy, while (68%) abstained. An odds ratio for SES level suggests that women with medium (OR= 0.68, CI=0.08-5.44) and higher (OR=0.71, CI=0.10-5.02) SES were less likely to use alcohol during pregnancy than the women with lower SES. However, there was no statistical significance between the SES level and alcohol use in pregnancy (p= 1.00).

Of the women who with no children (33%) had used alcohol during pregnancy, compared to (67%) who did not. Thirty nine of the women with 1 to 3 children were alcohol users in pregnancy, while (69%) were abstainers. Among the women with 4 to 6 children (17%) had used alcohol during pregnancy, while (83%) abstained. All the women with 7 to 10 children (100%) had used alcohol during pregnancy. An odds ratio for women with 4 to 6 children were (OR= 0.40, CI= 0.26-5.96) and women with 1 to 3 children (OR=1.3, CI=0.10-16.0), respectively. Women with 4 to 6 children were less likely to be users of alcohol during pregnancy, while women with 1 to 3 children were more likely to use alcohol during pregnancy than women with no children. However, there was no statistical significance between the parity and alcohol use during pregnancy (p= 0.14).

The results show that (34%) of women who had no miscarriages had used alcohol during pregnancy and (66%) abstained. Twenty three percent of the women who had 1 to 2 miscarriages were users of alcohol during pregnancy compared to (77%) who abstained.

Among the women who had 3 or more miscarriages (50%) were users of alcohol during pregnancy, while (50%) did not. The odds ratio for women with 1 to 2 miscarriages (OR= 0.58, CI=0.51-2.27) were less likely to use during pregnancy than women with no miscarriage. There was strong association between women with 3 or more miscarriages (OR= 1.9, CI=0.23-15.58) than women who had no miscarriages. This implies that women with 3 or more miscarriages were more likely to use alcohol during pregnancy than women who had no miscarriage. There was no statistical significance between the miscarriage and alcohol use during pregnancy (p= 0.52).

Table 8 below shows that of the women who had full-term pregnancy outcome (37%) were alcohol users during pregnancy, (68%) had not. Of the women who had pre-term pregnancy outcome (18%) were users of alcohol during pregnancy, while (82%) were not. All the women who had still-birth, (100%) had abstained from using alcohol during pregnancy. All the women who had voluntarily termination of pregnancy were users of alcohol during pregnancy. The individual variables show that pre-term pregnancy outcome had shown less than one odds ratio (OR= 0.38, CI= 0.70-2.01). This implies that women who had pre-term pregnancy outcome were less likely to be users of alcohol during pregnancy than women who had full-term pregnancy outcome. There was no statistical significance between the pregnancy outcome and alcohol use during pregnancy (p= 0.22).

Table 8: Association between socio-demographics profile and pregnancy alcohol use

	Alcohol Pregnancy Use (N)		**P-value**	**OR (95% CI)**	**P-value**
Age % (N)			0.31*		0.31
18-24	62.5% (5)	37.5% (3)		1 (Reference)	
25-34	59.1% (13)	40.9% (9)		1.1 (0.22 – 6.10	0.87
35-44	80.0% (16)	20% (4)		0.4 (0.07 – 2.53	0.34
Race % (N)			0.26*		0.17
Black/ African	59.1% (13)	40.9% (9)		1 (Reference)	
Coloured	66.7% (12)	33.3% (6)		0.72 (0.20 – 2.64)	0.62
White	90.0% (9)	10.0% (1)		0.16 (0.02 – 1.50)	0.11
Education % (N)			0.76*		0.64

Primary	80.0% (4)	20.0% (1)		1 (Reference)	
Secondary	65.0% (26)	35.0% (14)		**2.15 (0.21 – 21.17)**	0.51
Tertiary	80.0% (4)	20.0% (1)		1.00 (0.04 – 22.17)	1.00
Marital status % (N)			0.83*		0.75
Married	63.6% (14)	36.4% (8)		1 (Reference)	
Unmarried	69.6% (16)	30.4% (7)		0.76 (0.22 – 2.65)	0.67
Not living together	80.0% (4)	20.0% (1)		0.43 (0.04 – 4.62)	0.49
Employment status % (N)			0.57*		0.34
Unemployed	62.1% (18)	37.9% (11)		1 (Reference)	
Employed	75.0% (15)	25.0% (5)		0.50 (0.15 – 1.92)	0.35
Self-employed	100% (1)	0.0% (0)			
SES level % (N)			1.00*		0.93
Low	60.0% (3)	40.0% (2)		1 (Reference)	
Medium	68.8% (11)	31.3% (5)		0.68 (0.08 – 5.44)	0.72
High	67.9% (19)	32.1% (9)		0.71 (0.10 – 5.02)	0.73
Reproductive health% (N)					
Parity **% (N)**			0.14*		0.25
None	66.7% (2)	33.3% (1)		1 (Reference)	
1-3 children	60.7% (17)	39.3% (11)		1.3 (0.10 – 16.04)	0.84
4-6 children	83.3% (15)	16.7% (3)		0.40 (0.26 – 5.96)	0.51
7-10 children	0.0% (0)	100% (1)			
Miscarriage **% (N)**			0.52*		0.54
None	65.5% (19)	34.5% (10)		1 (Reference)	

1- 2	76.5% (13)	23.5% (4)		0.50 (0.15 – 2.27)	0.44
3 or more	50.0% (2)	50.0% (2)		1.90 (0.23 – 15.58)	0.55
Pregnancy Outcome **% (N)**			0.27*		0.22
Full-term	62.9% (22)	37.1% (13)		1 (Reference)	
Pre-term	81.8% (9)	18.2% (2)		0.38 (0.70 – 2.01)	0.25
Still-born	100.0% (1)	0.0% (0)			
Voluntary termination pregnancy	0.0% (0)	100% (1)			

*Fischer's exact test

Association between knowledge about FAS and alcohol use during pregnancy

The results show that (20%) women with no knowledge about alcohol effects on an unborn foetus were users of alcohol during pregnancy, while (80%) were abstainers. Of the women with knowledge about alcohol effects on an unborn foetus, (34%) were users of alcohol during pregnancy. There was strong association between women with knowledge about alcohol effects on an unborn foetus (OR= 2.10, CI= 0.21- 20.19) and alcohol users during pregnancy. This implies that the women with no knowledge about alcohol effects on unborn foetus are less likely to use alcohol during pregnancy, than women with knowledge. However, there was no statistical significance between the knowledge about alcohol effects on unborn foetus and alcohol use during pregnancy use (p= 0.47).

Table 9 below shows that (38%) of the women with lower knowledge of alcohol effects on foetus were alcohol users during pregnancy, while (62%) were abstainers. Among the women with medium knowledge (15%) had used alcohol during pregnancy, while (85%) had not. Of the women with higher knowledge (50%) were alcohol users during pregnancy, (50%) were not. The women with medium knowledge level (OR= 0.20, CI=0.21-20.19) were less likely to use alcohol during pregnancy than women with lower knowledge level. However, the women with higher knowledge level were more (OR= 1.6, CI=0.36-7.07) likely to use alcohol during pregnancy, than women with lower knowledge level. There was almost statistical significance between the knowledge level and alcohol use during pregnancy (p= 0.08).

Table 9: Association between knowledge about the FAS and alcohol use during pregnancy

	Alcohol Pregnancy Use (N)		**P-value (Fischer's exact)**	**OR (95% CI)**	**P-value**
Knowledge question % (N)	No	Yes	0.47*		0.51
No	80.0% (4)	20.0% (1)		1 (Reference)	
Yes	65.9% (29)	34.1% (15)		2.07 (0.21-20.19)	
Knowledge Level % (N)			0.08		0.06
Lower	61.5% (8)	38.5% (5)		1 (Reference)	
Medium	85.0% (17)	15.0% (3)		0.2 (0.05- 1.48)	
Higher	50.0% (8)	50.0% (8)		1.6 (0.36- 7.07)	

*1 Sided Fischer's Exact test

CHAPTER 5: Discussion AND Conclusion

This study aimed to determine the relationship between knowledge about the effects of alcohol on pregnancy and alcohol use in general, and in pregnancy. It was premised on the Health Belief Model, a theoretical framework exploring the constructs of perceived susceptibility and severity in relation to alcohol use. In addition to the socio-demographic measures, other measures included: assessing knowledge of alcohol effects on pregnancy, current use and use in pregnancy. The knowledge variable included a single response knowledge question and a knowledge scale on alcohol effects; lifetime and current use and frequency of alcohol use, in pregnancy.

Socio-demographic profile of the sample

Univariate analysis revealed that the majority of the women in the sample were Black/African women (81%); between the ages in the age group 25-34 years. The racial distribution is in line with that of the Tshwane Municipality, and national demographic statistics (Statistics South Africa, 2010). Of all the women in the sample, majority, (77%) had secondary education (grade 8 -12) and were single (never married).

In accordance with the Labour Force Survey (LFS), more than a decade of trend data consistently record women as having higher unemployment rates compared to men. In 2010, of the total increase in unemployment (145 000), the unemployment rate for women increased by a staggering (77%), (Statistics South Africa, 2010). This is reflected in the present study, where, (58%) of the sample were unemployed. In spite of high unemployment rates, forty seven percent of women indicated higher SES status. This could be due to either a methodological limitation of using only an asset indicator as a proxy measure for SES, or may in fact reveal that despite being unemployed, Urban South African women may be acquiring assets through other means. Recent research has revealed the existence of transactional sex, (Dunkle, Jewkes, Brown, Gray, McIntryre & Harlow, 2004) as one means of acquiring assets. In the context of risky drinking, this is a plausible explanation.

The reproductive history of these women shows that majority of the women had between 1 to 3 children, despite being unmarried. This in keeping with the parity levels among Black South African women, (Coovadia, et al. 2009) whereby it is not uncommon to have a child

out of wedlock. Of the women in the sample, a majority (81%) of them had no miscarriages as indicated by the fact that they had full-term pregnancy outcomes.

In terms of knowledge, findings revealed that the majority of women knew that alcohol has some effect on the unborn foetus. However, the knowledge of the different types of effects, (physical, social and mental) differed. Most women seemed to lack knowledge on mental setbacks for the child compared to physical and social setbacks respectively. This is notable, as the link between physical and mental setbacks are intertwined, whereby brain damage caused by alcohol use during pregnancy leads to mental setbacks (NIAA, 2008). This brain damage can occur as early as 6 weeks in pregnancy (Clarren 1996). One explanation for this may be due to the intangible nature of mental setbacks early on in pregnancy and after birth. Hence, women may not perceive their child to be at risk. The physical setbacks were shown to be well known by the women compared to social and mental setbacks. This is in keeping with the theoretical argument informed by the HBM and by this thesis, which argues that if a person does not perceive a real threat or risk to themselves or their foetus, they are unlikely to engage in a healthy behaviour.

Current Alcohol use

More than half of the women in the study had used alcohol in their lifetime and a staggering (76%) used alcohol at a risky level (1-4 drinks) in the 3 months prior to pregnancy. This is a common pattern of drinking among women in South Africa, whereby, in spite of drinking less on average, than men, they drink at risky levels and particularly on weekends, (Parry, 2005a; Parry 2007/2008). The fact that the majority of the sample drank at risky levels (58%) pre-pregnancy suggests that women in this urban sample are at a risk of an alcohol exposed pregnancy. This is reflective of the South African profile (Morojele, et al. 2010) and points to the need for a focus on urban/rural differences in drinking patterns and consequent prevention planning.

Alcohol use in Pregnancy

Given that the number of people who were pregnant in this study was very low, the following results should be interpreted with caution. Of the total number of pregnant women (N=29), (24%), indicated using alcohol monthly, (6%) indicated using alcohol weekly and the majority (68%) did not use alcohol in pregnancy. Several studies show that reported consumption during pregnancy is usually lower than pre-pregnancy levels (Alvik et al., 2006;

Bruce et al., 1993). This is reflected in this study. Though the small numbers limit the researcher's ability to conclude this, it is not unlikely that for the women who were pregnant, reported consumption is likely to be lower. On the other hand, Zammit et al., (2008), found that patterns of drinking pre-pregnancy are likely to reflect patterns in pregnancy. The present study reflects this somewhat, whereby, the women in both pre-pregnancy and pregnancy were highest monthly users of alcohol respectively. In addition, the women who indicated drinking "sometimes" and on "weekends, also reflect similar findings of those who in pregnancy. [The women consumed 1 to 4 drinks in both pre-pregnancy (58%) and during pregnancy (26%)]. However, larger samples of pregnant women may yield more conclusive findings about this pre and in pregnancy patterns.

Association between socio-demographic profile and current alcohol use

The women in the age group 25-34 were shown to be the highest current users of alcohol generally, followed by women of 35-44 years and 18-24 years respectively. This is keeping with both South African (May et al., 2008) and international studies, (Center for Disease Control, 2009) on prenatal alcohol use, which showed women older than 30 years to be the highest alcohol users. The findings of this study reflect this pattern somewhat.

In terms of race, Black African women were the highest current consumers of alcohol. This is contrary to Parry (2007/2008) that found that being Coloured and White was a risk factor for alcohol use among urban women. However, these findings are in keeping with the racial distribution of the sample in this urban area. Future studies with a more comparable number of women representing each race group may yield different findings.

The women who were single, with higher levels of education, who were employed and from a higher SES were shown to be the highest current users of alcohol. Most notably, employment status was statically significant for current alcohol use. This is not surprising, given that this profile of women are likely to have access to more disposable income, be able to access alcohol more easily and be part of a social circle of people who drink.

Regarding reproductive history, the women who had 1 to 3 children were shown to be the highest current users of alcohol, followed by women with no children, 4 to 6 children and 7 to 10 children respectively. The women with no miscarriages were shown to be the highest current users of alcohol, followed by women who had 1 to 2 miscarriages and 3 or more

miscarriages respectively. Not surprisingly, the women with one, two, three or more miscarriages were less likely to use alcohol in the past month. This could the explained by the susceptibility construct of HBM, that state that if a person believes they to be in some jeopardy to their health or that of their foetus, they are unlikely to engage in a risky behaviour.

This is further reinforced by the finding that women who had full-term pregnancy outcomes were shown to be the highest current users of alcohol, followed by women who had pre-term, voluntarily termination of pregnancy and still-born pregnancy outcome, respectively. In this case, women who had full-term pregnancies were not likely to perceive a threat to use of alcohol during their childbearing years because of previous successful pregnancy outcomes, as compared to those women who were pre-term, terminated or had still births. Most notably, pregnancy outcome was statically significant for current alcohol use, whereby women who had pre-term pregnancy outcome were more likely to be current alcohol users. This supports that hypothesis that when severity (perceived or real) is high, then a person is less likely to engage in the risky behaviour.

Association between socio-demographic profile and alcohol use in pregnancy

With the exception of marital and employment status, the socio-demographic characteristics of the women's current use of alcohol reflected similar patterns for pregnancy, What this means, is that Black women aged between 25-34 years old, who were more educated, and from a higher SES, were more likely than younger and older women to use alcohol in general. The differences of use in pregnancy are related to marital and employment status only, whereby married women, who were unemployed where more likely to use alcohol in pregnancy than their unmarried, employed counterparts. While more research with bigger samples of pregnant women is required to make conclusive arguments, the researcher argues for one potential reason for this finding. The argument is that, living with a partner who drinks and who is likely to provide some level of income, is likely to impact on their own drinking patterns. The former argument is supported by a previous study (Morojele, et al. 2010).

Association between knowledge of alcohol use and Current use

In terms of, the relationship between, knowledge of the effects of alcohol on an unborn foetus, and current use, findings revealed almost statistically significant results. Women who

knew of the effects were shown to be the highest current users of alcohol, compared to those with no knowledge. In terms of knowledge levels, women with higher knowledge were the highest current users of alcohol, followed by women with medium and lower knowledge respectively. This is a curious finding, and suggests that knowledge alone is not sufficient to deter women from using alcohol in general. Previous research has been criticized for not paying sufficient attention to the multiple factors influencing behaviour change (Noar, Zimmerman, 2004). Thus, this study reinforces the need for further research into the determinants of alcohol use, both in general, and in pregnancy. It concludes that while education is an important influencing factor for determining behaviour, and perceived susceptibility and severity are important constructs for determining behaviour, they may play a meditational rather than a determining role.

Though there was almost statistical significance between knowledge levels and alcohol use during pregnancy, this is likely to be the result of the small number of pregnant women in the current sample. Future research will benefit from a focus on bigger sample sizes of pregnant women and likely yield more conclusive results about these associations.

Limitations and Future Directions

This study has a few limitations, worthy of mention, namely, the use of self- report questionnaires suggests that, participants may have answered in a socially desirable manner. Given the fact that alcohol use among women, and particularly pregnant women is considered taboo, there is an increased likelihood of women answering in a socially desirable manner. A cursory glance of the total numbers for questions related to alcohol use in pregnancy revealed that in some cases, numbers varied between 29 and 50 women. While this may suggest some variation in understanding the pregnancy-related questions, it may also be symptomatic of under-reporting, due to stigma.

A further limitation of this study relates to recall bias and potential misunderstanding of the questions related to current status of pregnancy and their last pregnancy. As a secondary study the researcher was unable to ensure that the manner in which questions were asked would directly answer the questions of this thesis.

Finally, the small sample size of pregnant women in the study restricts the researcher in drawing conclusions about the associations between the independent and dependent variables. Future studies will benefit from much larger sample sizes to draw more convincing

conclusions. This study is however, a useful starting point for understanding the socio-demographic profile of urban women in relation to alcohol use in general in pregnancy; and the relationship between knowledge of alcohol effects and use in general and in pregnancy. The available findings suggest the need for urban/rural specific prevention planning.

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APPENDIX 1: Confirmation Letter ()

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Faculty of Health Sciences
School of Health Systems and Public Health

6 July 2010

Ms Leane Ramsoomar
Lecturer and Academic Co-ordinator
Masters in Public Health Program
School of Public Health
Wits Medical School
7 York Road
Parktown, Johannesburg

Dear Ms Ramsoomar,

We hereby grant permission to Ms Lehlohonolo Tebogo Chandu to use the data set from the Comprehensive FAS Prevention Programme research project (supported by Cooperative Agreement Number 1 U01 DD00044 from the Centers for Disease Control and Prevention; CDC), to conduct a secondary data analysis study for the purposes of her MPH project.

We wish Ms Chandu the best of luck with her project.

Yours sincerely

Dr Kirstie Rendall Mkosi (Principal Investigator)

Dr Neo Morojele (Co-Principal Investigator)

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University of Pretoria
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APPENDIX 2: Code List

Appendix A

CODE LIST

The secondary data analysis will use this code list to recode the variables to meet the needs of the analysis. The interviewer numbers from the primary study will be recoded to 1-606 for the secondary data analysis.

Independent variable

1. Knowledge

1.1. Does the drinking of alcohol during pregnancy have any effect on the unborn fetus?

No ☐ 0 Yes/sometimes ☐ 1 Do not know ☐ 2

1.2. In what ways can a baby be affected if a mother drinks in pregnancy?

Physical setback No ☐ 0 Yes ☐ 1
(Physical growth, special facial features, speech problems)

Mental setback No ☐ 0 Yes ☐ 1
(Intellectual ability, learning problems)

Social setback No ☐ 0 Yes ☐ 1
(Social integration, behavioral problems)

1.3 From the above questions a knowledge categorical variable will be coded as follows:

Equal to one and less than zero will be regarded as low level of knowledge = 0. At two and three will be considered high level of knowledge = 1.

Low level of knowledge ☐ 0
(0)

Middle level of knowledge ☐ 1
(1-2)

High level of knowledge ☐ 2
(3)

2

2. Socio-demographic profile

2.1. How old are you? _____in years

The numeric age variable will be recoded into a categorical variable as follows:

Age

18-30	☐	1
31-44	☐	2

2.2. What is the highest level of education you have passed?

The education status will be categorized into the following groupings:

Education

Preprimary (less than one year completed)	☐	0
Primary (Grade 1-7)	☐	1
Secondary (grade 8-12)	☐	2
Tertiary (degree, diploma, further studies incomplete)	☐	3

Marital status

2.3. What is your current marital status? ☐

The following variables will be will be categorized into groups:

Married/cohabitation (Legally married, traditionally married and living with man or woman in union)		1
Unmarried (Single/never married)	☐	2
Not living together (Divorced/widow/separate)	☐	3

2.4. Which race group do you consider yourself to belong to?

The race variable will be coded as:

Race

Black/African	☐	1
Coloured	☐	2
White	☐	3
Asian/Indian	☐	4

2.5. Which of the following describes your current employment status?

The employment status variable will be classified as unemployed, employed and self-employed.

Employment status

Unemployed	☐	0
Employed (Part time and full time)	☐	1
Self-employed	☐	2

2.6. Does your house have?

There were eight assets and commodities listed items: Electricity, radio, television, telephone, fridge, computer, washing machine and cell phone. Less than five will be regarded as low socio-economics status (SES) = 0. Five and more items will be considered high socio-economic status (SES) = 1.

Socio-economics status (SES)

(Any asset and commodity)

0-2 items	☐	0

Low SES

3-5 items ☐ 1

Middle SES

6-8 items ☐ 2

Middle SES

Reproductive health history (pregnancy experiences)

How many children have you given birth to in your lifetime?

None ☐ 0

1-3 children ☐ 1

Low parity

4-6 children ☐ 2

Middle parity

7-10 children ☐ 3

High parity

How many miscarriages have you had in total, if any?

None ☐ 0

1 to 2 ☐ 1

3 to 4 ☐ 2

5 or more ☐ 3

What was the outcome of the pregnancy?

Full-term ☐ 1

Pre-term (premature) ☐ 2

Still-born ☐ 3

Voluntarily terminated pregnancy ☐ 4

Miscarriage ☐ 5

Dependent variables

1. Alcohol use

Lifetime alcohol use

1.1. Have you ever had a drink containing alcohol?

No ☐ 0 (Exclusion criteria)

Yes ☐ 1 (Inclusion criteria)

Current alcohol use

1.2. Do you still take a drink with alcohol sometimes?

No ☐ 0

Yes ☐ 1

1.3. How often do you have a drink containing alcohol?

The coding will remain the same.

>= Monthly ☐ 1

2 to 4 times a month ☐ 2

2 to 3 times a week ☐ 3

6

4 or more times a week ☐ 4

1.4. How many days have you drunk alcohol during the past month?

The data will be dichotomized into categories.

No. of days

0-5 ☐ 0

6-10 ☐ 1

11-25 ☐ 2

26-30 ☐ 3

Alcohol use in pregnancy

1.5. How many months pregnant are you right now?

In this study the answers for pregnancy months will be categorized into trimesters.

Not pregnant ☐ 0

1st trimester (1-3 months) ☐ 1

2nd trimester (3-6 months) ☐ 2

3rd trimester (7-9 months) ☐ 3

Don't know ☐ 4

1.6. When last were you pregnant?

The answers will be recoded by having three categories.

0 - 1 year ☐ 1

2-5 years ☐ 2

> = 5 years ☐ 3

1.7. Did you plan to stop drinking because of the pregnancy?

The coding will remain the same as the in the primary study except that not applicable.

Yes ☐ 1

No ☐ 0

Pattern of alcohol use: before and after knowing about the pregnancy

1.8. During the three months before you became pregnant how often did you drink?

Never ☐ 0

Monthly ☐ 1
(Monthly or less, 2 to 4 times a month)

Weekly ☐ 2
(2 to3 times a week)

Daily ☐ 3
(4 or more times a week)

1.9. During the three months before you became pregnant, on what days did you drink?

Never ☐ 0

Sometimes ☐ 1

Weekdays only ☐ 2

Weekends only ☐ 3

Both ☐ 4
(Weekends and weekdays)

1.10. During the three months <u>before you became pregnant</u>, how many drinks containing alcohol did you have on a typical day when you were drinking?

<u>Binge drinking</u>

The data will be recoded into the following.

None ☐ 0

1-5 ☐ 1

5-10 ☐ 2

10 or more ☐ 3

1.11. <u>After you knew you were pregnant</u> how often did you have a drink containing alcohol?

Never ☐ 0

Monthly ☐ 1
(Monthly or less, 2 to 4 times a month)

Weekly ☐ 2
(2 to3 times a week)

Daily ☐ 3(4 or more times a week)

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1.12. <u>After you knew you were pregnant</u> on what days did you drink alcohol?

The coding will be done in this way.

Never	☐	0
Sometimes	☐	1
Weekdays only	☐	2
Weekends only	☐	3
Both (Weekends and weekdays)	☐	4

1.13. <u>After you knew you were pregnant</u> how many drinks containing alcohol did you have on a typical day when you were drinking?

<u>Binge drinking</u>

The numerical variable will be recoded into a categorical variable this way.

None	☐	0
1-5	☐	1
5-10	☐	2
10 or more	☐	3

1.14. Have your ever been told that a child of yours has fetal alcohol syndrome?

In this data, the not applicable will not be included.

No	☐	0
Yes	☐	1

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APPENDIX 3: Ethics Clearance

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG
Division of the Deputy Registrar (Research)

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)
R14/49 Mrs Lehlohonolo T Chandu

CLEARANCE CERTIFICATE	**M10105**
PROJECT	The Relationship between Knowledge of Alcohol Effects on Pregnancy and Alcohol Use among a Start a Sample of Urban Women
INVESTIGATORS	Mrs Lehlohonolo T Chandu.
DEPARTMENT	School of Public Health
DATE CONSIDERED	29/10/2010
DECISION OF THE COMMITTEE*	Approved unconditionally
	29/10/2010

Unless otherwise specified this ethical clearance is valid for 5 years and may be renewed upon application.

DATE 29/10/2010 **CHAIRPERSON** .....
(Professor PE Cleaton-Jones)

*Guidelines for written 'informed consent' attached where applicable
cc: Supervisor : Leane Ramsoomar

DECLARATION OF INVESTIGATOR(S)

To be completed in duplicate and **ONE COPY** returned to the Secretary at Room 10004, 10th Floor, Senate House, University.
I/We fully understand the conditions under which I am/we are authorized to carry out the abovementioned research and I/we guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Committee. **I agree to a completion of a yearly progress report.**

PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES...