Part 0: Preamble

Psychosocial factors associated with female problematic and binge drinking in a South African rural and urban setting.

Candidate: Tate Lowrey (LWRTAT001)

Supervisor: Prof. Leslie London

Co-supervisor: Neo Morojele

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Declaration of Plagiarism

Signed by candidate

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Abstract

Background: The overconsumption of alcohol is one of the leading preventable causes of many adverse health, psychological, and social problems.

Literature Review: Alcohol consumption patterns for South Africa from various findings were reported and compared to global levels and patterns. It was illustrated that psychosocial factors are controversial yet generally regarded as having an important role to play in understanding population health problems and alcohol consumption patterns. Risk factors for problematic and binge drinking among women in South Africa were identified.

Aim: The aim of this study was to explore psychosocial factors and their associations with problematic and binge drinking behaviour among women who currently drink between 18 - 44 years of age in an urban and rural setting in South Africa.

Methodology: This study was a secondary analysis from a previous study conducted in 2006. The baseline study was part of the formative stage of a multistage study aiming to create a comprehensive intervention programme to prevent Fetal Alcohol Syndrome (FAS). Random sampling methods were used to recruit 1018 women in an urban area in the Gauteng province (N= 606) and a rural area in the Western Cape province (N=412). This study compared psychosocial variables of women who currently drank at safe levels to women who drank at problem and binging levels and compared them across a rural and urban setting. Univariate analyses and multiple logistic regression techniques were employed to determine associations.

Ethics: The baseline study (001/2007) and this study (575/2011) were approved by the Faculty of Health Sciences Research Ethics Committees of the University of Cape Town

Results: Twenty per cent and 41% of respondents in the urban and rural site respectively were current drinkers. Of those current drinkers, significantly less urban women were drinking at problematic

levels compared to rural women, 33% (40/121) and 73% (124/170) respectively. Moreover, 62.8% (76/121) of urban drinkers and 83.5% (142/170) of rural drinkers reported binge drinking. Problematic drinkers in both sites were more likely to have low self-esteem compared to non-problematic drinkers. For urban women, multiple logistic regression analyses showed the presence of an alcohol problem in at least one immediate family member as a significant predictor for both problematic drinking (adjusted odds ratio [AOR]=2.88 [95%CI: 1.01-8.18] controlling for socioeconomic status and employment) and binge drinking (AOR=3.87 [95%CI: 1.31-11.40], controlling for age of onset of alcohol consumption, ethnicity and smoking). In the rural site, a significant predictor for problematic drinking was having a binge drinking partner (AOR=3.02 [95%CI: 1.38-6.64**],** controlling for education). There were no significant predictors for binge drinking.

Conclusions: The results show that drinking patterns in close relationships, low self-esteem and geographical influences are significantly different between those who are problematic and binge drinkers compared to those who drink at safe levels. Tailored interventions to prevent harmful drinking patterns from developing in women that take into consideration familial drinking behaviour, self-esteem and geographical influences are needed.

Acknowledgements

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Part A: Project Proposal

Problem Identification

High levels of alcohol consumption among certain urban and rural female populations in South Africa have been linked to many negative health outcomes such: as domestic violence (Jewkes, Levin, & Penn-Kekana, 2002), Fetal Alcohol Syndrome (FAS) (May et al., 2008), and an increased risk for HIV (Chersich et al., 2010). Alcohol consumption is especially problematic for woman of childbearing age who, unaware of their pregnancy status for months, may be exposing a fetus to the life-long damaging effects of alcohol. There is a paucity of research ascertaining the psychosocial make up of woman of childbearing age in rural and urban communities in South Africa and whether psychosocial factors are associated with problematic and binge drinking behaviour.

Literature Review

Alcohol is recognized to be the most commonly consumed psychoactive drug in many societies (Plant, 1997). While it can provide great pleasure, likewise it has the potential to produce a number of harmful health outcomes for males and females alike as well as breakdown the social fiber of society at large (Edwards et al., 1994).

Excessive alcohol consumption in South Africa has been shown to be a public health problem. Research shows South Africa to have one of the highest levels of alcohol consumption per adult drinker in the world (Rehm et al., 2003). In 2000, it was estimated that alcohol use contributed to 7% of disability-adjusted life years (DALYS) lost in South Africa, ranking alcohol misuse third out of 17 risk factors studied (Schneider et al., 2007). Additionally, alcohol-related problems in developing countries such as South Africa have been found to result in increased violence, various cancers, damage to the neuro and cognitive development of the unborn foetus, risky sexual practices and

general reduced nutritional status of families with a heavy drinking parent or parents (Parry, 2001). Moreover, a study conducting surveillance on alcohol misuse in South Africa cited a high proportion of patients in trauma units and of mortality cases (due to homicide, traffic collisions and suicide) tested positive for alcohol (Parry et al., 2005). It also found upwards of 74% of violence cases admitted to state hospitals in highly urban areas were alcohol positive.

The overconsumption of alcohol not only has a negative impact on health indicators, but also has direct and indirect consequences for families, communities and society. Intoxication from drinking and alcohol dependence specifically have been linked to various social consequences. Intoxication can directly cause traffic accidents leading to accidental injury or death. An acute social consequence such as a car accident can lead to more chronic and debilitating results when employment has been lost or individuals face social marginalization. Importantly, there also are indirect implications of intoxication that can erode communities. For instance, as when a road accident results in the death of a non-intoxicated bystander. Such a consequence can have devastating effects for families especially financially if the primary income has been lost (Rehm et al., 2003). Alcohol dependency can affect an individual's ability to retain employment and avoid harm on the job. It was found in South Africa that 17% of sick days taken by sawmill workers were found to be alcohol-related. Another study conducted in Orange Free State found that 20% of gold mine workers involved in occupational injuries had elevated blood alcohol concentrations (World Health Organization [WHO], 2004).

Excessive drinking has been identified as causing increased levels of aggression (Bushman & Cooper, 1990). Aggression fuels episodes of violence that can result in crime as well as homicide-a top cause of the mortality burden in South Africa (Bradshaw et al., 2003). Violence and crime can undermine the social cohesion of the community and weaken an individual's sense of safety and trust. Additionally, low stocks of social capital (exposure to violence in communities and anti-social

behaviour) have been linked with adverse impacts on an individual's health (Egan, Tannahill, Petticrew, & Thomas, 2008).

There has been a growing trend internationally recognizing the need to study gender differences in drinking habits and the related gender-different responses. The World Health Organization supports researching gender differences to aid in better addressing the gamut of problems due to risky drinking practices (Obot et al., 2005; Angove & Fothergill, 2003). Problematic drinking and binge drinking have been on the rise among women in South Africa. According to the World Health Organization binge drinking definitions for women constitutes consuming 5 or more drinks in one sitting (WHO, 2000). Although research has shown that in South Africa females drink less alcohol and less frequently than men (Simbayi et al., 2004), estimates show that around 30% of South African females use alcohol (Rehm et al., 2003) and a 1/3 do so at risky levels over weekends (Parry et al., 2005). Morojele et al. (2010) reported the rate of lifetime alcohol use for women in a rural site in the Western Cape (WC) and urban site in Gauteng to be 72% and 40% respectively. For the same locations, Ojo et al., (2010) found 46% of the women in the rural site to be current drinkers and 27% in the urban site. Of the current drinkers in the WC, 46% did so at problematic levels compared to 27% in Gauteng.

Binge drinking has important links with unfavorable health and social consequences for women. According to the latest figures published by the WHO in 2011, the percent of current female and male drinkers in South Africa who have a heavy episodic/binge drinking pattern are 41.2% and 48.1% respectively. A study examining alcohol use for Kenyan female sex workers found binge drinking to be associated with unsafe sex, sexual violence and sexually transmitted infections (Chersich et al., 2007). It has also been shown that the physical, psychological and social effects of alcohol are more severe for women than for men (Angove & Fothergill, 2003). A study looking at

characteristics of suicide attempters in South Africa found 77% of the sample reported being intoxicated and a significant predictor for attempting suicide was being female (Allan, Roberts, Allan, Pienaar, & Stein, 2001). Additionally, Morojele et al. (2004) found that the characteristic lifestyle of heavy female drinkers compounds their risk of becoming sexually affected by their drinking.

Women of childbearing age with binge drinking habits have unique health risks. It is common for women to not know they are pregnant for many months into the pregnancy. Heavy and especially binge drinking during this time can have serious consequences for women's pregnancies and their children. Binge drinking is known to be particularly damaging to the developing fetus, especially in the first and third trimesters of pregnancy. Naimi, Lipscomb, Brewer, and Gilbert (2003) found that compared to women with intended pregnancies, women with unintended pregnancies were more likely to report preconception binge drinking. Moreover, women who reported binge drinking before pregnancy compared to those who did not binge drink, were more likely to be exposed to violence, to consume alcohol, binge drink and smoke during pregnancy. Maternal drinking can lead to the risk of having a spontaneous abortion, premature labor or stillbirths (Angove & Fothergill, 2003). Importantly, drinking alcohol during pregnancy can lead to Fetal Alcohol Syndrome (FAS), the most severe form of prenatal damage (May et al., 2008). This is of particular concern in South Africa where the rates of FAS in the Western Cape and Gauteng, 6.8-8.9% (May et al., 2007) and 1.9% (Viljoen, Craig, Hymbaugh, Boyle, & Blount, 2003) respectively, have been found to be some of the highest reported in the world. Another study found that current maternal alcohol consumption, binge drinking in the past 6 months and alcohol use six months before pregnancy was associated with behavioural disorders in their children in Cape Town, South Africa (Katwan, Adnams, & London, 2011).

Psychosocial predictors

In the last couple of decades, a psychosocial approach has arisen in the field of Public Health as a broader means to explore and understand risk factors on population patterns of mortality and morbidity. Psychosocial epidemiology explores the way individuals' interactions with their social environments may affect health either directly (e.g. biological responses to 'stress') or indirectly through health behaviours (Siegrist & Marmot, 2004). There is a lack of consensus in the literature around the theories underpinning psychosocial concepts as well as what defines a psychosocial factor, how to measure it, and what are the possible processes involved.

Mutaner and Chung (2005) critique some psychosocial constructs such as "social capital" or "sense of coherence" as expected to deliver generalized risk factor associations across time and place, but they ignore the formative social structure. To them, a more useful and accurate account of how society affects health should include less ideological models and integrate social structure and psychosocial exposures in the mechanisms influencing health. Additionally, Macleod and Smith (2003) argue that there are too many limitations and weaknesses in the study designs for researching psychosocial factors to claim casual links between adverse psychosocial exposure and health inequalities. They also present the importance of social class and one's power to access material resources as a commonly overlooked concept and which could be a better candidate to help explain inequities.

Nonetheless, Egan, Tannahill, Petticrew, and Thomas (2008) consider psychosocial health interventions that take into consideration people's social support and networks, feelings of security and trust, and people's participation in the local community have an important role in addressing public health problems. In a meta-review conducted by Egan, et al. (2008) exploring how psychosocial factors may relate to population health, the researchers identified a spectrum of various psychosocial

risk factors as potential important contributors to ill health. Generally, the various studies supported the evidence linking psychosocial factors such as social support and networks, social capital, and social cohesion to indicators of better health. Conversely, evidence of poorer psychosocial environments due to factors like demands, exposure to community violence or anti-social behaviour tended to be associated with poorer health.

The concept of social capital as it applies to public health issues is also controversial but generally regarded in the literature as an important factor that matters in population health (Szreter & Woolcock, 2004). Social capital refers to the characteristics of social relationships, such as levels of interpersonal trust and standards of reciprocity and mutual aid, that foster collective action for mutual benefit (Siegrist & Marmot, 2004). Social capital has been empirically linked to many positive health outcomes such as improved mental health, lower violent crime rates and delinquency, lower mortality rate, lower susceptibility to binge drinking, to depression and to loneliness (Siegrist & Marmot, 2004). Recently, studies have shown that the higher the stocks of social capital a community has, the higher the health achievements of the community seem to be (Kawachi, 1999).

A literature review exploring women's relationship with alcohol points to a complex myriad of underlying causes for women's drinking habits (Angove & Fothergill, 2003). Many studies illuminated the complex links between the physical, psychological and social problems experienced by women. An exploratory study of women's perception of the major factors that contributed to their alcohol abuse found that women used alcohol to cope with boredom, emotional pain, feelings of loneliness, low self-esteem and poor self-image (Long & Mullen, 1994). The same researchers found a link between past physical and emotional abuse and alcohol misuse. Studies have also indicated excess drinking for many women can be a way to conceal or placate how they feel emotionally (Angove & Fothergill, 2003).

Several risk factors associated with problematic drinking in South African women living in urban and rural settings have been identified. Ojo et al. (2010) found inverse associations between high-risk drinking and socioeconomic measures (SES) such as: currently employed, possessed 5 or more household amenities, and lived in a household that never/seldom went hungry. Women who reported having alcohol problems in at least one family member and who were a current smoker were more likely to have high risk drinking patterns.

Motivation and Rationale

What is not well identified in the literature is if psychosocial risk factors have a role to play in better understanding the causes and motivations for female problematic and binge drinking habits in the South African context. This study aims to fill this gap in the evidence by exploring psychosocial factors among women in a rural and urban South Africa setting and their associations with problematic and binge drinking behaviour. The justification for this study is it will add to the knowledge base around psychosocial risk factors and problematic and binge drinking patterns among women in South Africa. Additionally, this study might illuminate areas for future evaluation for the development of more effective preventative and treatment interventions for harmful alcohol use.

Research Aim

To examine the associations between psychosocial factors and alcohol use, specifically a.) problematic use and b.) binge drinking, in drinking women of childbearing age in an urban and rural community in South Africa.

Research Objectives

(1) To compare the prevalence of different psychosocial factors for drinking woman who engage in a.) problematic drinking versus non-problematic drinking and b.) binge drinking versus non-binge drinking.

(2) To identify psychosocial variables that are associated with a.) high Alcohol Use Disorders Identification Test (AUDIT) scores indicating problematic drinking behaviour and b.) binge drinking, within and across an urban and a rural community in South Africa.

(3) To examine the effect of urban/rural status on the associations between psychosocial factors and problematic and binge drinking patterns.

Definition of terms

Problematic drinking refers to drinking patterns that incur harmful consequences or cause alcohol-related problems for the individual and others (Babor, Higgins-Biddle, Saunders, & Monteiro, 2001). AUDIT scores of 8 and higher will be used in this study to indicate problematic drinking.

Binge drinking in this study will be defined as consuming 5 or more drinks at a single sitting, which is the definition adopted by the WHO for binge drinking amongst women (WHO, 2000).

Psychosocial is a term used in this study to refer to the macro- and meso-level social process that lead to perceptions and psychological process at the individual level. It is the influence of social factors on an individual's mind or behaviour and to interrelations of behaviour and social factors (Martikainen, Bartley, & Lahelma, 2002).

Study design

This study is a secondary analysis of an already existing dataset from a previous study completed in 2006. The previous study was a baseline study conducted as part of the formative stage

of a multistage study aiming to create a comprehensive intervention programme to prevent Fetal Alcohol Syndrome (FAS). The project was a collaboration involving the University of Pretoria, the Medical Research Council, the University of Cape Town and the Centers for Diseases Control and Prevention in the USA (PI:Kirstie Rendall-Mkosi; Co-PI: Neo Morojele; CI: Leslie London; CI: John Matjila). The research was approved by the Faculty of Health Sciences Research Ethics Committees of the Universities of Pretoria (121/2005) and Cape Town (381/2005).

The study that generated the dataset for this study was a descriptive cross-sectional household survey using cluster and stratified random sampling methods and data collection via face-to-face interviews with women of childbearing age.

Population and sampling

Study population

The study subjects were women of childbearing age between 18-44 years who lived in a rural wine farming area of the Western Cape and an urban site in Gauteng.

Setting and Sampling Methods

The two study sites included in the baseline study were a rural farming area of the Western Cape and an urban area of Pretoria in the Tshwane Municipality.

Rural Site. The rural site is in the Western Cape province and included the areas spanning three local municipalities of the West Coast District Municipality: Cederberg, Bergrivier and Swartland. The combined population of the three municipalities, based on the 2001 population census, is just under 160,000 (Morojele et al., 2010,). This site was chosen because evidence of high alcohol use by rural women in this area has been documented (May et al., 2008).

Sampling for this site used a stratified cluster random sampling approach with a target of recruiting 650 women as participants. First, farms were chosen within the boundaries of the selected

areas, with a probability proportional to the number of farms in each municipality. From a total set of 1450 farms across the 3 municipalities, 150 farms were randomly selected, with oversampling to take account of un-contactable, ineligible, and nonfunctional farms. Finally, all eligible women (18–44 years) in every household within each of the participating farms (n=58) were approached to participate in the study. All eligible women per farm were included due to the small average number of households per farm (approximately seven) and the large distances between farms (Morojele et al., 2010).

Urban Site. The urban site is located within the City of Tshwane Metropolitan Municipality which is the highly industrialized and urbanized area of Gauteng. The 2005 population estimates for this site had over 340,000 residents. According to Morojele et al. (2010), alcohol is widely obtainable through legal and illegal outlets, and alcohol use is becoming increasingly normative for women in areas such as these.

The sampling method was to first randomly select 82 census enumeration areas; then from each area, 10 households were randomly selected using aerial photographs to identify households within the selected areas; finally, one eligible woman (i.e., 18–44 years) within each selected household was randomly selected and invited to participate in the study (Morojele et al., 2010).

Sample size

From the baseline dataset, the percentages for current drinkers were 188/412 for Western Cape and 166/606 for Gauteng (Ojo et al., 2010); the percentages for problematic drinkers (AUDIT scores 8 and above) were 33/606 for Gauteng and 120/412 for Western Cape (Ojo et al., 2010); and percentages for binge drinkers were 107/412 for Western Cape and 58/606 for Gauteng. See Table 1.

Table 1: Percentage of outcomes for rural and urban site

	Western Cape	Gauteng
Current drinkers	188/412 (46%)	166/606 (27%)
Problematic Drinkers- as % total sample	120/412 (30%)	33/606 (6%)
Problematic drinkers-as % current drinkers	120/188 (64%)	33/166 (20%)
Binge drinkers	107/412 (26%)	58/606 (10%)

Measurement

Instrument

A household KAP survey was used to collect the data in the baseline study. Respondents' socio-demographic information, psychosocial features, drinking and smoking patterns and use of reproductive health services were obtained. The psychosocial measures were obtained from various scales on the questionnaire which included a.) self-esteem (feelings about self), b.) mental health, c.) partner and family drinking practices d.) social support, and d.) community profile. The questionnaire also included the 10 core questions of the Alcohol Use Disorders Identification Test (AUDIT) (Babor et al., 2001) Research has shown AUDIT may be especially useful when screening women (National Institute on Alcohol Abuse and Alcoholism [NIAAA], 2005). The data collected in the questionnaire was based on survey tools previously used in South Africa.

Additionally, during the larger study, sensitivity training was given to the fieldworkers by the Co–PI due to the sensitivity of the alcohol and reproductive health questions. The questionnaire was pre-tested in a neighbouring area of each site. It was translated into the 5 most commonly used

languages of the research population. An information pamphlet was handed to each respondent as part of the recruitment of the participants which was all women of child-bearing age regardless of their levels of drinking. Pamphlets were dispersed as part of a community awareness campaign. The pamphlet included information on the levels of risky drinking, and a list of local service providers in which women can visit for assessment and counseling if they should recognise their own need or anyone else in the family.

Definition of variables

Predictor (Independent) variables. The predictor variables will be the scores on different psychosocial scales dichotomized across validated cut offs which quantify respondents' psychosocial factors. The psychosocial variable coding has been set up so that 'negative' psychosocial measures (i.e. low self-esteem, poor mental health, weak social capital and weak social support) are the exposure of interest since that forms the basis of the hypothesized association.

a.) ***Self-esteem perceptions.*** Scores were summed and dichotomised across the 75th percentile on the ten-item Likert style self-esteem scale developed by Rosenberg (1965) to denote high (assigned "0") versus low self-esteem "1".

b.) ***Mental health perceptions.*** Scores from five-item mental health scale of the MOS Short-Form General Health Survey (Stewart, Hays, & Ware, 1988) were dichotomised by first summing scores and then transferring to a 0 to 100 scale. Scores 67 or lower were assigned a "1" for poor mental health and all others were assigned a "0".

c.) ***Social support.*** Scores on an eight-item social support scale (Sherbourne & Stewart, 1991) were summed and dichotomised across the 75th percentile, into weak "1" versus strong "0" social support**.** Specifically, emotional support, affectional support and positive social interaction were measured.

d.) ***Social capital.*** Scores on a six-item social capital scale (Martin, Rogers, Cook, & Joseph, 2004) were summed and dichotomised across the 75th percentile, into weak "1" versus strong "0" social capital.

e.) ***Partner and family drinking.*** Answers were dichotomized for yes there is a problem ("1") and no there is not ("0") to various questions about drinking problems in family members and with current partner.

Outcome (Dependent) Variables. The outcome variables include problematic drinking and binge drinking.

a.) ***Problematic drinking.*** Scores on a 10-item Alcohol Use Disorder Identification Test (AUDIT) were summed and dichotomized with scores of 8 or more assigned a "1" and defined as problematic drinkers. Scores 7 and under were assigned a "0" and were defined as non-problematic drinkers. These cut-offs were based on the recommendations by the WHO, which defines scores of 8 or more as probable high-risk drinking and scores 7 and under low-risk drinking (Babor, et al., 2001).

Please note problematic drinking on the AUDIT can be further broken down into three more specific categories: hazardous drinking (scores 8-15), harmful drinking (score of 16-19), and alcohol dependence (score of 20-40). Problematic drinking, that is AUDIT score 8 and above, will be examined for the sake of a larger sample size as well as simplification in analysis. Moreover, since the aim of the greater study is to create prevention interventions for FAS, a condition which can be caused by the levels and frequency of alcohol consumption spanning all the spectrums of AUDIT categories, combining the strata to make one variable will be sufficient as contributing evidence.

b.) ***Binge drinking*.** This variable was derived from the survey question: How often do you have six or more drinks on one occasion? Answers consisted of *never=0 monthly or less=1, monthly=2, weekly=3, daily or almost daily=4*. Respondents with a score of 1 or more were assigned a "1" for binge drinking. Respondents with scores of 0 were assigned a "0" for non-binge drinking.

Confounders or effect modifiers. There are variables that will need to be controlled for because of their potential confounding or modifying effects on the outcome variables. Possible variables as confounders will be determined by applying these 3 criteria (1) Is it a risk factor for outcome? (2) Is it independently associated with the explanatory variables? (3) Is it a consequence of the outcome? Several variables associated with high-risk drinking have been identified as potential confounders from a study conducted by Ojo et al. (2010). It was also be possible that these variables were independently associated with the psychosocial variables. For example, participants with higher mental health and mental health scores could be more likely to be employed. Also, those who were older could either have lower scores due to deteriorating health or may have higher scores because they have had more time to work on self-acceptance. Those with lower scores may be more likely to smoke or may have started drinking at a younger age, etc.

a) Currently employed
b) SES
c) Smoker
d) Age
e) Marital status
f) Age of onset of alcohol consumption

Definition of terms-detailed

Psychosocial concepts encounter a lack of consensus in the literature regarding definitions and usages (Egan et al., 2008). The description I find most appropriate for this study derives from investigators Martikainen, Bartley, and Lahelma (2002) which states, "a central constituent of psychosocial explanations of health is that macro- and meso-level social process lead to perceptions and psychological process at the individual level." Additionally, psychosocial is a term to describe the influence of social factors on an individual's mind or behaviour as well as the interrelations of behaviour and social factors (Martikainen et al., (2002).

Self-esteem in this study is the term which referred the extent a person felt competent, worthy and confident in one's ability. It also refers to the extent an individual values and accepts oneself (Mruk, 2006).

Social support is the multi-dimensionality of the interpersonal relationships and the different ways relationships can help an individual's life (Sherbourne & Stewart, 1991).

Social capital refers to those characteristics of social relationships—such as levels of interpersonal trust and norms of reciprocity and mutual aid—that facilitate collective action for mutual benefit (Kawachi, 1999).

Problematic drinking refers to drinking rates and level of consumption that incur harmful consequences or cause alcohol-related problems for the individual and others, as defined by the WHO (Babor et al., 2001). In this study, problematic drinking will be also an umbrella term encompassing the other terms used by the WHO for high alcohol consumption, ie. hazardous drinking, harmful drinking and dependent drinking.

Binge drinking is consuming six or more drinks per occasion on either a daily, weekly, monthly or less than monthly basis. One drink is defined as equivalent to one can or bottle of beer,

cider or coolers, one glass of wine, or one tot of spirits. Four or more drinks for women is the more accepted definition for binge drinking (Courtney & Polich, 2009), however, the baseline survey question contained six or more drinks, therefore six was the cut-off.

Data Management and Analysis

Data collection

Data collection for the larger study was already completed.

Data exploration

Raw data from the study will be analysed using STATA 10 (STATA for Macintosh, version 10, Stata Corp; College Station, TX). Initial data exploration will consist of univariate and bivariate analysis.

Univariate analysis will consist of exploring the data for normality as well as graphically representing frequency distributions in histograms and box-plots. Summary statistics such as mean and standard deviation will be calculated for normally distributed data, and for non-normally distributed data the median and ranges will be calculated. Categorical psychosocial data will be explored for frequency distribution and will be graphically represented by pie charts.

Bivariate analysis will be conducted to determine any associations between the psychosocial explanatory variables (see Table 1) and problematic drinking outcomes versus non-problematic drinking outcomes and binge drinking outcomes versus non-binge drinking outcomes. These will be explored using Chi-square tests of association at a 0.05 alpha level as well as associations between categorical explanatory variables.

Table 2: Psychosocial explanatory variables

Explanatory variables	Coding	Type
Self-esteem	0= high self-esteem 1=low self-esteem	Categorical binary
Mental health	0= high mental health 1= low mental health	Categorical binary
Social Support	0=strong support 1=weak support	Categorical binary
Social Capital	0=strong social capital 1=weak social capital	Categorical binary
Partner binge drinking	0=no binge drinking partner 1=has binge drinking partner;	Categorical binary
Alcohol problem in at least one family member	0=no family members with alcohol problem 1=one or more family members with alcohol problem	Categorical binary

***Confounders*.** As explained above, possible variables as confounders may include

a) Currently employed

b) SES

c) Smoker

d) Age

e) Marital status

f) Age of onset of alcohol consumption

Regression

Logistic regression analysis and model building will include a multi-level modelling technique to measure the relative strength of psychosocial factors in accounting for the women's

problematic and binge drinking behaviours separately in the two different sites. A series of models will be built and then compared by analyzing likelihood ratio tests including AICs to see which model has the best profile. A stratified analysis will be conducted to account for the different study sites.

Model diagnosis will be done to assess the model for goodness of fit. Also, scatterplots of standardized residuals, leverage, dbeta and linear prediction will be generated to assess for possible outliers and influential points and assess for linear predication. Any cases identified as outliers or influential will be examined.

Ethics and Communication

This study is a re-analysis of data deriving from a larger study. I will not be reporting back to the participants who have previously received reports on the study. However, I will report back the final study findings to local health services by supplying the report to district health managers.

Human subjects recruitment and characteristics

The study population is the total population of approximately 350 000 people living in two defined areas of two provinces in South Africa. The participants were women of child-bearing age 18 to 44 years.

Informed consent

Participation was based on full informed consent. A consent form was signed by all survey respondents before any of the questions were posed, and after their rights had been explained to them (in the language of their choice). They were free to decline to participate in the study. For those participants who were illiterate, an adult community member was asked to witness the reading of the consent document, and the consenting participant was asked to mark the consent form with an "x". Any respondent who refused to participate in the interview was replaced by a respondent in the household on the left of that household (See Appendix 2).

Survey

Data were collected using de-identified data sets. Each questionnaire had a study number and data of interest was aggregated and analysed without any person being identifiable in the results.

Potential Risks and benefits to individuals

Since I am analysing the already collected data and therefore will have no interaction with human subjects, there are no potential risks to individuals.

Potential benefits of the proposed research of subjects and others

I anticipate the study subjects will only benefits from my study indirectly in that more information will be known of the target population by local health staff and researchers so that further studies can be done to develop interventions and find solutions.

Importance of the knowledge to be gained

The knowledge gained in this study will add to the knowledge base for alcohol use for women in South Africa. The information will increase the representation of women in alcohol research. Also, the information could be used to inform the development of intervention studies which could develop more effective implementation strategies to reduce the prevalence of alcohol problems and the subsequent health and social problems.

Since there is almost no risk involved in participating in the study, the benefits to the individual participants, and the knowledge gained for the greater good far outweigh the potential risks.

Data Management

Data management for the larger study involved the creation of two separate data management systems for the 2 different sites respectively. All the household surveys have been stored and locked in cabinets at the Medical Research Council. For my study, data management will involve storing the data in a locked folder on my computer, only to be accessed with a password.

Stakeholders

Stakeholders include: participants, their families and communities of the study, policy-makers, liquor outlet owners, wine and other farmers, National and Provincial Department of Social Development and Department of Health, community social service providers, community health service providers, and other researchers in the field.

Logistics

Time Frame

Month 1

Familiarize self with data from both sites

Analyze data for associations

Month 2

Continue analysis of data

Write-up results and discussion sections

Month 3

Submit mini-dissertation to Health Sciences Facility as well as journal of choice.

Budget. I anticipate that no costs will be incurred.

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Appendices

Appendix 1

Study reference group and community advisory boards (from larger study)

Study reference group

Kirstie Rendall-Mkosi (PI, Univ Pretoria)

Neo Morojele (co-PI, Medical Research Council)

Leslie London (Co-investigator, Univ Cape Town and chair of Dopstop Association)

John Matjila (Co-investigator, Univ Pretoria)

Adlai Davids (GIS specialist, Human Sciences Research Council)

Steve Olorunju (Statistician, Medical Research Council)

Judith Shopley (Librarian, SANCA Resource Centre)

Shamim Garda (Director, SANCA National Office)

Member to be recruited from Tshwane Social Development

Member to be recruited from Western Cape Provincial Government

Community Advisory Board – Tshwane

Kirstie Rendall-Mkosi (PI)

Neo Morojele (co- PI)

Elosine Aucamp (Head of services: SANCA Thusong Eersterus/ Mamelodi/ Nelmapius Alcohol & Drug Centre)

Member to be recruited from local development agency

Member to be recruited from local health & social services

Member to be recruited from local community of Eersterus

Member to be recruited from local community of Mamelodi

Community Advisory Boards – Rural Western Cape

Kirstie Rendall-Mkosi (PI)

Neo Morojele (co-PI)

Madge Jackson (Acting director of Dopstop, Stellenbosch)

Debbie Bell (project manager of Dopstop)

Ruth Fortuin (Director of SANCA, Bellville)

SANCA project manager to be recruited

3 Members to be recruited from 3 different farming areas included in study eg. Montagu, Paarl, Worcester.

Part B: Structured Literature Review

By Tate Lowrey (LWRTAT001)

Introduction

In 2000, it was estimated that alcohol use contributed to 7% of disability-adjusted life years (DALYS) lost in South Africa, ranking alcohol misuse third out of 17 risk factors studied (Schneider et al., 2007). It is known that women are more likely than men to experience physical harm, sexual assault and psychosocial effects when they drink (Walter et al., 2003; Nolen-Hoeksema, 2004). High levels of alcohol consumption among South African women in certain urban and rural areas have been associated with several adverse health and social consequences including: domestic violence (Jewkes, Levin, & Penn-Kekana, 2002), risky sexual practices (Kalichman, Simbayi, Jooste, Cain, & Cherry, 2006; Morojele et al., 2006, Avalos et al., 2010), HIV (Chersich & Rees, 2010) and Fetal Alcohol Syndrome (May et al., 2008, Morojele et al., 2010). Studies investigating underlying causes for alcohol problems in women indicate there are complex links between physical, psychological and social problems involved (Angove & Fothergill, 2003). This dissertation examined psychosocial factors among women in a rural and urban setting in South Africa and their associations with problematic and binge drinking behaviour. In order to inform this research, the objectives of this literature review were:

(1). To summarize and critically examine published work on gender differences in alcohol consumption patterns and drinking rates in South Africa broadly as well as within urban and rural areas specifically, and to compare the South African rates and patterns to that found globally.

(2). To review psychosocial concepts and the influence of psychosocial exposures on health outcomes and alcohol-related behaviour.

(3). To synthesize research studies that have identified risk factors for problematic and binge drinking patterns amongst women in South Africa.

Search strategy. To find relevant studies, the following search engines were utilized: Google Scholar, PubMed, EBSCOhost, Science Direct, JSTOR, and MedLine. Also, bibliographies of selected peer review articles were searched to find any relevant studies.

Exclusion criteria. Studies that were not in English and published before the year 1990 were not included.

Inclusion criteria. This review included research studies, systematic reviews as well as any documents published by the World Health Organization that provide relevant information.

Search key words. Alcohol**,** alcohol consumption, alcohol use, alcohol misuse, alcohol abuse, risk factor, psychosocial factor, psychosocial determinant, self-esteem, mental health, social support, social capital, family history, intrapersonal risk factors, gender, women, South Africa, urban, rural

Alcohol consumption patterns

Gender differences in drinking patterns in South Africa have been fairly well documented (Parry et al., 2005; Shisana et al., 2005; Shisana et al., 2008). Table 1 summarizes the results of three household surveys: the South African Demographic and Health 1998 Survey (SADHS) reported by Parry and colleagues (2005), The 2005 South African National HIV, Incidence, Behaviour and Communication survey ([SABSSM II] Shisana et al., 2005), and the 2008 South African National HIV, Incidence, Behaviour and Communication survey ([SABSSM III] Shisana et al., 2008). A consistent finding for all three surveys was higher current drinking rates for men versus women. The most recent survey (SABSSM III, 2008) reported an increase in over one percent of the rate of current drinkers for women since the previous survey (SABSSM II, 2005) from 15.7% in 2005 to 17.1% in 2008. Parry and colleagues (2005) reported that the percentage of current drinkers who engaged in

risky drinking over the weekends was almost equal for men and women (32.8% and 32.4% respectively). However, SABSSM II (2005) found that 36.3% of male current drinkers engaged in binge drinking, which was appreciably different from the 20.6% of female counterparts. The most recent reports revealed that 17.0% (39.4% of current drinkers) of men and 2.9% (16.6% out of current drinkers) of women engaged in hazardous and harmful drinking (SABSSM III, 2008). The definitions used for hazardous and harmful drinking came from the Alcohol Use Disorder Identification Tool (AUDIT). Hazardous drinking was defined as a quantity or pattern of alcohol consumption that placed patients at risk for adverse health events. Harmful drinking was defined as alcohol consumption that resulted in adverse events (Babor, Higgins-Biddle, Saunders, & Monteiro, 2001). Scores of eight or more were indications of such drinking behaviour.

The population surveys, in addition to recent studies, have looked at the different drinking rates for urban and rural settings. Figures for rural, urban and the top provincial drinking rates are highlighted below.

A trend consistent in the population surveys reviewed was that urban residents were more likely to have higher rates across all drinking statuses than rural inhabitants. However, SADHS (1998) and SABSSM II (2005) found higher rates of binge drinking with current female drinkers in rural areas versus those in urban areas. SABSSM III (2008) did not have a rate for binge drinking with female current drinkers, but concluded that provinces with the highest levels of female drinking occurred in the following order: Northern Cape, Western Cape then Gauteng. Morojele et al. (2010) and Ojo et al. (2010) echoed these findings. Morojele et al. (2010) reported the rate of current alcohol use for women in Gauteng was 20.1% and 41.3% in the Western Cape. The researchers also reported hazardous/harmful drinking rates for women of 7.6% in Gauteng and 32.8% in the Western Cape. For the same locations, Ojo et al. (2010) found current drinking rates for women of 27% in Gauteng and

46% in the Western Cape. Of the current drinkers, 20% in Gauteng and 64% in Western Cape were considered to be drinking at hazardous and harmful levels. The rates reported in the two studies above, which were based on the same primary data, differed because, although both studies used the AUDIT definitions for hazardous and harmful drinking, Morojele et al. (2010) included current drinkers who had consumed alcohol at least one day in the last month whereas Ojo et al. (2010) included only current drinkers who still take a drink with alcohol.

There are some limitations for being able to draw conclusions from the comparisons of these different studies. The tools for assessing drinking patterns and the definitions for determining binge drinkers were not the same between the SADHS survey and the two SABSSM surveys. SADHS utilized a four-question assessment tool, termed CAGE (O'Brien, 2008), whereas the other studies used the AUDIT. Also, SADHS measured risky drinking as opposed to binge or hazardous/harmful drinking (i.e. AUDIT scores of 8 or more) and defined risky drinking as five or more drinks per day for men and three drinks or more per day for women. Furthermore, the SADHS study measured only drinking taking place on weekends. The two SABSSM surveys measured binge drinking using similar criteria for men but a different criteria for women. Binge drinking was defined for women as four or more drinks in one sitting in the past month.

There was a lack of consensus in the alcohol research field on what constituted problematic and binge drinking and what are the best screening tools, especially for women. Definitions varied across borders, ethnicities and sexes. This disagreement is problematic considering which definition and diagnostic tool employed can significantly affect the statistics produced. Bradley, Boyd-Wickizer, Powell, and Burman (1998) found the CAGE, AUDIT, and TWEAK questionnaires were the optimal tests for identification of alcohol abuse and dependence in women and were more sensitive in studies of black women versus white women in the United States. Bradley et al. (1998) also reported

many studies validating alcohol screening questionnaires have often not involved women or not offered sex-specific analyses. Henceforth, research comparing alcohol use questionnaires for female patients is limited, especially for women of different races and ethnicities. No research was found that stated preferred measure for identifying at-risk and hazardous/harmful drinking for women specifically. However, the CAGE and AUDIT were the most widely validated methods of screening for problematic alcohol use (Maisto & Saitz, 2003) and the AUDIT seemed to be the most internationally studied validated instrument for women (Reinert & Allen, 2002). The National Institute on Alcohol Abuse and Alcoholism (NIAAA) stated the AUDIT may be especially useful for screening women and minorities (NIAAA, 2004). McCusker, Basquille, Kkhwaja, Murray-Lyon, and Catalan (2002) reported the AUDIT to be most effective in classifying patients with at-risk, hazardous, or harmful drinking, while the CAGE questionnaire proved better for identifying alcohol abuse and dependence. The researchers concluded that the AUDIT was preferable in clinical practice as identifying drinkers in an earlier state may improve the effectiveness of consumption reducing interventions. Reinert and Allen (2007) reported the growing body of research on the psychometric properties of the AUDIT supported the criterion validity of the English version as a screening tool for alcohol dependence and for less severe alcohol problems in various cultural settings. More research was needed to establish the properties of the non-English version. They found the AUDIT to be internally consistent even when used in diverse samples, with the median reported Cronbach's alpha in the 0.80s. However, they stated the cut-points for successful detection of hazardous drinking as well as identification of alcohol dependence or harmful use in women needed to be reduced from the originally recommended cut-off value of eight. It has been reported that alcohol screening questionnaires tend to have lower sensitivities in women versus men at the same cut-off points (Bradley et al., 1998). There were differing opinions (or evidence?) on what (which?) threshold value

should be used for women. Reinert and Allen (2007) recommended the threshold value should be lowered to four or more. Non-English European studies found a score of five may be the best cut-off (Gache et al., 2005; Neumann et al., 2004). On the other hand, a few studies found that the AUDIT and the criteria of a score of eight or more for hazardous/harmful drinking seemed appropriate for males and females alike (Conigrave, Hall, & Saunders, 1995; Steinbauer, Cantor, Holzer, & Volk, 2005).

There are similar issues in alcohol research concerning binge drinking definitions and measurement. The ubiquitous definition within the field has been five or more drinks on a single occasion (Jackson, 2008). Another widely adopted definition included a gender-specific measurement of four drinks for women and five drinks for men (Jackson, 2008). While these definitions seemed to be the standard, Jackson contended there was no empirical basis for their designation. The WHO used the terminology Heavy Episodic Drinking (HED) to refer to binge drinking and defined it as consuming 60g of pure alcohol, an amount Jackson stated as roughly equivalent to five drinks per occasion. However, the WHO claimed 60g corresponded approximately to six standard alcoholic drinks (WHO, 2010). The NIAAA (2004) defined binge drinking as a pattern of drinking that elevates a person's blood alcohol concentration (BAC) to 0.08 grams percent or above. This level typically occurs with five or more drinks in two hours for men and four or more drinks in two hours for women. The preferred instrument to identify binge drinking in women in diverse setting seems to be the AUDIT. However, it has been argued that because women report psychosocial consequences at a lower consumption, the AUDIT might be more effective at identifying binge drinking in women if the question asking about binge drinking (or HED) asked women about the frequency of drinking "4 or more" drinks instead of "6 or more" drinks (Bradley et al., 1998).

Another limitation to consider was the use of self-reporting of alcohol consumption in the above-mentioned studies. This may lead to information and social desirability bias. However, in regard to information bias, London (2000) stated that self-reporting is more likely to result in under reporting rather than over reporting. Schneider et al. (2007) also agreed that figures from population surveys in South Africa on alcohol consumption were an underestimate, as often people do not respond truthfully to the sensitive issue of alcohol consumption. However, this argument has not been backed by evidence.

Even though these findings revealed men consume more alcohol than women, they showed high levels of problematic consumption patterns for women who use alcohol, especially in rural areas. High levels of Fetal Alcohol Syndrome further indicate high levels of alcohol consumption among women in South Africa (May et al., 2007). Moreover, national averages of drinking rates can be deceptive because different patterns and rates may apply for sub-areas and sub-populations.

Table 1: Alcohol drinking status rates (percentages) among women: a three-survey comparison.

Population survey	Current drinking in past month		Binge drinking in past month (amongst current drinkers)		Harmful/Hazardous Drinking (amongst current drinkers)	
	Men	Women	Men	Women	Men	Women
South African Demographic and Health Survey SADHS(1998) and Parry et al. (2005) *	44.6	16.9	14.6 (32.8)	5.4 (32.4)	CAGE 27.6	9.9
South African National HIV, Incidence, Behaviour and Communication (SABSSM II) 2005 survey	39.2	15.7	14.3 (36.3)	3.2 (20.6)	AUDIT 12.7	2.2
South African National HIV, Incidence, Behaviour and Communication (SABSSM III) 2008 survey	41.5	17.1	17.1	3.8	AUDIT 17.0 (39.4)	2.9 (16.6)

*Risky drinking on weekends measured

The highest global alcohol consumption levels have been found in the developed world, mainly in the Northern Hemisphere. Generally, high-income countries tended to have the highest alcohol consumption levels. Medium consumption levels have been found in North and South America as well as in southern Africa, with Namibia and South Africa as the countries in this region having the highest levels. Regions such as North Africa and sub-Saharan Africa, the Eastern Mediterranean, southern Asia and the Indian Ocean all had reports of low levels of alcohol consumption (WHO, 2011).

While western Europe has one of the highest global alcohol consumption levels, it is one of the only regions with the least risky drinking patterns. The most risky patterns of drinking were found in Kazakhstan, Mexico, the Russian Federation, South Africa and Ukraine. Patterns of drinking have been categorised by the WHO to reflect the frequency and circumstances of alcohol consumption and the proportion of people drinking alcohol to intoxication. In summary, South Africa is among the countries in the world with medium alcohol consumption levels, and is among the handful of countries with the riskiest drinking patterns (WHO, 2011).

Psychosocial concepts related to health

In recent years, researchers in the field of Public Health have begun to pay increasing attention to psychosocial risk factors to understand population patterns of mortality and morbidity. Psychosocial epidemiology explores the way individuals' interactions with their social environments may affect health either directly (e.g. biological responses to 'stress') or indirectly through health behaviours (Siegrist & Marmot, 2004). There is a lack of consensus in the literature around the theories underpinning psychosocial concepts related to health as well as what defines a psychosocial factor, how to measure it, and the possible processes involved. Egan, Tannahill, Petticrew, and Thomas

(2008:2) and Martikainen, Bartley, and Lahelma, (2002:1092) concurred that "a central constituent of psychosocial explanations of health is that macro- and meso-level social process lead to perceptions and psychological process at the individual level." Macleod and Smith (2003) considered psychosocial factors to be any exposure that may influence a physical health outcome through a psychological mechanism. Such exposures included various mental states, psychological traits, and characteristics of the social environment.

Mutaner and Chung (2005) critiqued some psychosocial constructs, for example "sense of coherence", as expected to deliver generalized risk factor associations across time and place, but ignore the formative social structure. To Mutaner and Chung, a more useful and accurate account of how society affects health should include less ideological models. Models should integrate social structure and psychosocial exposures in the mechanisms influencing health. Additionally, Macleod and Smith (2003) argued that there were too many limitations and weaknesses in the designs of the studies that research psychosocial factors to claim casual linkages between psychosocial exposures and health outcomes. They argued that material factors and conditions are as important and an often overlooked determinant of health inequalities. Macleod and Smith doubted if psychosocial interventions to improve psychological states, such as feelings of control, without changing the conditions of people's lives, such as whether they can afford certain material resources, would solve health problems.

Nonetheless, Egan et al. (2008) contended psychosocial health interventions that take into consideration people's social support and networks, feelings of security, trust, and empowerment have an important role in addressing public health problems. In a meta-review conducted by the same researchers exploring the relationship between psychosocial factors and population health, the researchers identified a spectrum of psychosocial risk factors as potentially important contributors to

population health. Generally, the various studies supported evidence linking psychosocial factors such as: social support, social networks, and social cohesion to indicators of improved health. Conversely, evidence showed that poorer psychosocial environments comprising of factors including: social demands, exposure to community violence or anti-social behaviour tended to be associated with reduced health.

One of the most researched psychosocial factors in the literature is social capital. The concept of social capital, as it applies to public health issues, was also controversial but was generally regarded in the literature as an important factor that matters in population health (Szreter & Woolcock, 2004). Social capital has been defined and measured in many different ways. Nevertheless, Woolcock (2001) stated that many researchers across various disciplines were beginning to agree on a similar definition, which he summarized as ''the norms and networks that facilitate collective action.'' Kawachi (1999) defined social capital as characteristics of social relationships, such as levels of interpersonal trust and standards of reciprocity and mutual aid, that foster collective action for mutual benefit.

Increased social capital has been empirically linked to many positive health outcomes such as: improved mental health, lower violent crime rates and delinquency, lower mortality rates, and lower susceptibility to binge drinking, depression and to loneliness (Sampson, Raudenbush, & Earls, 1997; Szreter & Woolcock, 2004). Other studies showed that communities with higher stocks of social capital appeared to have improved overall health for members of that community (Kawachi, 1999). Alternatively, some investigators argued that the social properties that result from social networks are not always beneficial for a community (Portes & Landolt, 1996). Caughy, O'Campo, and Muntaner (2003) found that children in poorer neighborhoods whose parents reported knowing few of their neighbors had lower levels of internalizing problems compared to those who knew many of their neighbors.

Psychosocial factors and problem drinking

The literature on psychosocial factors influencing women and men's alcohol consumption is vast. Several themes have been highlighted and focused more on women than men. Topics included: coping, self-esteem, interpersonal relationships, social capital and social support.

Motives and coping

One of the most common perspectives in the literature on motives to drink alcohol was that individuals use alcohol as a coping method because of a belief that alcohol will relieve negative emotions (Sher, Grekin, & Williams, 2005). There was much evidence where researchers found alcohol was used to cope with depression, distress or to escape unwanted negative feelings (Abbey, Smith, & Scott, 1993; Cooper et al., 2008; Cooper, Frone, Russell, & Mudar, 1995; Long & Mullen, 1994).

Cooper et al. (1995) tested this hypothesis by conducting a cross-sectional study in the United States of 2544 adolescent and 1933 adult men and women randomly selected from two urban sites in New York, drinking to cope with negative emotions and distress were significant predictors of alcohol use and abuse in both adolescents ($p<0.01$) and adults ($p<0.001$). However, the study investigators indicated causal inferences were limited because of the reliance on a cross-sectional study design.

Additionally, Tsai, Floyd, O'Connor, & Velasquez (2009) demonstrated that women who felt serious psychological distress were more likely to use alcohol and be heavy drinkers. They also found that on an annual basis, an estimated 1.1 million women of childbearing age in the United States had a co-morbidity of alcohol use and serious psychological distress. While the results showed a significant association, the direction of the association was limited due to the cross-sectional study designs. Pitkanen (1999) and Sperling et al. (2000) found supporting results whereas Sayette (1999) revealed inconclusive evidence as to whether negative affective states, independent of coping motives, were

related to alcohol use and abuse. Nolen-Hoeksema (2004) contended that results depend on the method of measurement for distress and alcohol use, and if a community sample is being investigated or only people with alcohol-use disorders.

Self-esteem

The literature provided evidence that low self-esteem may have an important role in the development of alcohol use disorders (Nolen-Hoeksema, 2004). According to Jessor, Vandenbos, Banderryn, Cost, & Turbin (1995), a low sense of self worth and low confidence in one's ability to handle challenges, two components of self-esteem, represent risk because partaking in problem behaviour can be a way to cope with such negative feelings. Haney and Durlak (1998) illustrated significant improvements in self-esteem led to concomitant changes in participant's risk behaviour and ability to cope. In a community sample of young adults, Walitzer and Sher (1996) reported that low self-esteem predicted an alcohol use disorder diagnosis in women but not in men.

At the same time, Mullan and NicGabhainn (2002) showed there were no significant differences in self-esteem scores between those who drank regularly and those who did not, nor with those with different levels and frequency of past drunkenness in Ireland, stratified by gender. However, the self-esteem scores were quite homogenous across the exposure groups, which may be why no associations were found with drinking behaviour. They also confirmed a trend found in Irish self-esteem literature that women tend to report lower levels of self-esteem than men. The nature of the impact of self-esteem on alcohol consumption patterns remained unclear. However, the concept of self-esteem was generally regarded as one contributing factor out of many involved in determining risk behaviour and alcohol abuse (Goodson, Buhi, & Dunsmore, 2006).

Interpersonal relationships

Social influences are one of the strongest correlates of drinking (Andersson, Johnsson,

Berglund, & Ojehagen, 2007). A family history of alcohol problems has been shown to be a risk factor for problem drinking in individuals as well as the development of future alcohol problems (Hawkins, Catalano, & Miller, 1992; Sher, Walitzer, Wood, & Brent, 1991). While the risk for children of alcoholics to develop alcohol use disorders is well established, the extent to which environmental factors contribute to this familial risk is controversial (Sher et al., 2005)

Associations have been found between intimate partner drinking habits. Demers, Bisson & Palluy (1999) found there were strong similarities between women's patterns of drinking, including binge drinking, and their husbands' or male partners' patterns of drinking. Graham & Braun (1999) reported similar results.

Using the Framingham Heart Study, Rosenquist, Murabito, Fowler, and Christakis (2010), assessed alcohol consumption and social network ties in 12,067 people in a longitudinal cohort study, between 1971 and 2003. They demonstrated that the behaviour of relatives and friends was significantly associated with an individual's drinking behaviour. While temporal relationships are hard to infer, the investigators reported subjects who were directly connected to someone who drinks heavily (1 degree of separation) were 50% (95% confidence interval [CI], 40% to 62%) more likely to drink heavily. Also, individuals surrounded by heavy drinkers increased the reported alcohol consumption by around 70%(CI, 35% to 142%) versus those with no connection to heavy drinkers.

Rosenquist et al. (2010) also discovered gender played a role among spouses with regard to alcohol consumption. Heavy drinking by a husband increased the likelihood that a wife drank heavily by 126% (CI, 67% to 202%) whereas heavy drinking by a wife increased the likelihood that the husband drank heavily by 196% (CI, 91% to 329%). The effect among siblings was significantly smaller and did not differ whether the contact was a sister (37% [CI, 0% to 85%]) or a brother (34% [CI, 8% to 66%]). Notably, the confidence intervals for the results were wide. Caution should be taken

when interpreting the results due to the variability in the estimates.

Social capital and social support

Social capital and social support are factors shown to be associated with problem drinking, mostly having protective effects. Several studies showed higher levels of social capital were associated with decreased individual risk for problem drinking (Weitzman & Kawachi, 2000). For example, Weitzman & Chen (2005) found that students from colleges with higher levels of social capital reported reduced risks for several problem drinking patterns. Those with higher levels of social capital were around 60% less likely to binge drink (adjusted odds ration [OR] 0.38, 95% CI 0.20-0.69) than those with low stocks. Also, individuals with high social capital levels were half as likely to start binge drinking in college (adjusted OR 0.48, 95% CI 0.24 - 0.95) and abuse alcohol (adjusted OR 0.55, 95% CI 0.34 to 0.91). While the studies provided evidence for the positive influence of social capital on drinking, only college students were surveyed thus limiting the ability to generalize the results beyond four-year American colleges. Furthermore, it was a cross sectional therefore the direction of association was hard to determine.

High levels of social support, or supportive social networks, were shown to be inversely associated with alcohol abuse (Tucker et al., 2005) and positively associated with alcohol abstinence (Kaskutas, Bond, & Humphreys, 2002). Low levels of social support were inversely associated with women's alcohol dependence or abuse (Thundal, Granbom, & Allebeck, 1999) While there has been growing attention to the relationship between social capital, social support and health, data on their relationship with alcohol consumption was quite limited. Moreover, some investigators found social support to be a controversial predictor for alcohol use, critiquing it for being ill defined and inconsistently measured (Galea, Nandi, & Vlahov, 2004).

Risk factors for problem drinking for women in South Africa

Several risk factors associated with problematic drinking in South African women have been identified. Ojo et al. (2010), in a study of women of childbearing age in the Western Cape and Gauteng, concluded there were inverse associations between high-risk drinking and socioeconomic measures such as: being currently employed, possessing five or more household amenities, and living in a household that never/seldom goes hungry. Women who reported having alcohol problems in at least one family member and who were a current smoker are more likely to have high risk drinking patterns. O'Connor et al. (2011) reported risk factors such as younger age, being single, having better living conditions, having a greater number of sexual partners, and a higher prevalence of intimate partner violence were all associated with hazardous drinking prior to pregnancy recognition among township women in Cape Town. One study found low scores of religiosity was a predictor for past-month alcohol use and binge drinking among first-year university students (Peltzer, Dorothy, & Phaswana, 2002). The same study reported a family history of drinking or drug problems was predictive for current alcohol, but was not stratified by gender.

Conclusion

Data on alcohol consumption patterns in South Africa showed men to drink more than women. However, several adverse health and social consequences have been associated with problem drinking in women; indicating the levels at which women consume alcohol appear to put them at risk for adverse effects. Furthermore, in certain communities, risks for women may not be markedly different to that of men, or at least are of the same degree, and may even be slightly lower. Some risk factors for problem drinking in women in South Africa included mostly socio-demographic variables, a few psychosocial factors and other problem. Much of the research in South Africa investigating problem drinking in women focused on risk factors for alcohol exposed pregnancies, Fetal Alcohol Syndrome,

or risky sexual practices. Research investigating binge drinking mainly focused on adolescents, high school students or university students. There is little research concentrating on psychosocial factors for problematic and binge drinking behaviour in women who drink. Further research gaps include a lack of data that compares psychosocial factors across urban and rural settings.

The works described in this review reflected a substantial body of evidence examining the relationship of psychosocial risk factors to health outcomes and problematic alcohol use. Positive influences such as social support and good self-esteem have protective effects and are associated with indicators of better health and lower drinking problems. Poor psychosocial environments such as a family history of alcohol abuse or low stocks of social capital tended to be associated with poorer health and alcohol abuse. However, evidence for causal links of psychosocial factors on these outcomes were inconclusive.

The aim of this study was to explore psychosocial factors among women who currently drink and their associations with problematic and binge drinking behaviour in an urban and rural setting in South Africa. The justification for conducting this study is it will add to the knowledge base surrounding psychosocial factors and problematic and binge drinking patterns in women in South Africa.

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Part C: Journal Article

Psychosocial factors associated with female problematic and binge drinking in a South African rural and urban setting.

Abstract

The aim of this study was to explore psychosocial factors among women who currently drink and their associations with problematic and binge drinking behaviour in an urban and rural setting in South Africa. In 2006, a cross-sectional study and random sampling methods were used to recruit 1018 women between 18 - 44 years of age in urban areas in Gauteng province (N= 606) and a rural wine farming area in the Western Cape province (N=412) of South Africa. Women provided information regarding their sociodemographic, psychosocial and alcohol consumption characteristics through face-to-face interviews using a household survey. Twenty per cent and 41% of respondents in the urban and rural site respectively were current drinkers. Of those current drinkers, significantly less urban women were drinking at problematic levels compared to rural women, 33% (40/121) and 73% (124/170) respectively. Moreover, 62.8% (76/121) of urban drinkers and 83.5 % (142/170) of rural drinkers reported binge drinking. Problematic drinkers in both sites were more likely to have low self-esteem compared to non-problematic drinkers. For urban women, multiple logistic regression analyses showed an alcohol problem in at least one immediate family member as a significant predictor for both problematic drinking (adjusted odds ratio [AOR]=2.88; 95%CI: 1.01-8.18, controlling for socioeconomic status and employment) and binge drinking (AOR=3.87; 95%CI: 1.31-11.40, controlling for age of onset of alcohol consumption, ethnicity and smoking). In the rural site, a significant predictor for problematic drinking was having a binge drinking partner (AOR=3.02; 95%CI: 1.38-6.64**,** controlling for education). There were no significant predictors for binge drinking. The results show that drinking patterns in close relationships, low self-esteem and geographical influences are significantly different between those who engage in problematic and binge drinking versus those who drink at safe levels. Tailored interventions are needed to prevent harmful drinking patterns from developing in women.

Keywords: Alcohol consumption, problematic drinking, binge drinking, psychosocial factors, women, South Africa

Introduction

Excessive alcohol consumption is one of the leading preventable causes of many adverse health, psychological, and social problems. This level of alcohol consumption is problematic because it can result in many negative consequences such as: depressive episodes, severe anxiety, insomnia, suicide, abuse of other drugs, liver cirrhosis and several types of cancer (World Health Organization [WHO], 2000; Schuckit, 2009). Many social consequences are also strongly related with high levels of alcohol consumption which includes drink driving injuries and casualties, aggression, disruptions to the family structure and lowered industrial productivity (WHO, 2000). When looking at the effects of alcohol consumption, not only is the quantity of alcohol consumed important, so is the way in which it was consumed, the pattern of drinking. Populations with the same level of alcohol consumption but different drinking patterns can have very different health outcomes (WHO, 2011). Binge drinking is a particularly harmful drinking pattern that contributes to a significant portion of alcohol-related problems and deaths around the world (Courtney & Polich, 2009).

Excessive alcohol consumption in South Africa is a public health problem. In 2000, it was estimated that alcohol use contributed to 7% of disability-adjusted life years (DALYS) lost in South Africa, ranking alcohol misuse third out of 17 risk factors studied (Schneider et al., 2007). South Africa is also deemed to have one the riskiest patterns of drinking and have one of the highest alcohol-attributable burden of diseases in the world (WHO, 2011).

There has been a growing trend internationally recognizing the need to study gender differences in drinking habits and consequences (Angove & Fothergill, 2003). This can better lead to reducing the differential health burdens through more gender-specific prevention and treatment programs (Obot & Room, 2005). For example, women are more likely than men to experience physical harm, sexual assault

and psychosocial effects when they drink (Walter et al., 2003; Nolen-Hoeksema, 2004). Furthermore, women experience negative health consequences at lower levels of alcohol than men (Walter et al., 2003).

In studying the etiology of alcohol use disorders and how they develop, researchers point to various psychological and social causes. Studies investigating underlying causes of alcohol problems in women indicate there are complex links between physical, psychological and social problems involved (Angove & Fothergil, 2003). In recent years, researchers in the field of Public Health have begun to pay increasing attention to psychosocial risk factors to understand population patterns of mortality and morbidity. A central component of psychosocial explanations of health is that macro- and meso-level social processeses lead to perceptions and psychological process at the individual level (Martikainen et al., 2002).

Problematic drinking levels and patterns among some South African women places them at risk for various adverse health and social consequences including: domestic violence (Jewkes & Penn-Kekana, 2002), risky sexual practices (Kalichman et al., 2006; Morojele et al., 2006, Avalos et al., 2010), an increased risk for contracting HIV (Simbayi et al., 2006; Chersich & Rees, 2010), neuro and cognitive damage to the unborn fetus (Parry, 2001) and Fetal Alcohol Syndrome (May et al., 2008; Morojele et al., 2010).

Much of the research in South Africa investigating problem drinking in women has focused on general risk factors for alcohol-exposed pregnancies, Fetal Alcohol Syndrome, or risky sexual practices. Research investigating binge drinking has mainly focused on adolescents, high school students or university students. There is little research concentrating on the differences between women who drink at levels that put them at risk for adverse consequences, and women who drink at low to moderate levels. Consequently, there is not much research on psychosocial factors among women who have problematic and binge drinking patterns compared to women who drink at 'safe' levels. Further research gaps include

a lack of data that compares psychosocial factors for women who drink across urban and rural settings. The aim of this study was therefore to explore psychosocial factors among women who currently drink and their associations with problematic and binge drinking behaviour in an urban and rural setting in South Africa.

Method

This study was a descriptive cross-sectional household survey using cluster and stratified random sampling methods and data collection via face-to-face interviews with women of childbearing age in 2006.

The two study sites included urban areas in Gauteng province and a rural farming area of the Western Cape province of South Africa. For the urban site, simple cluster random sampling was used. Firstly, 82 census enumeration areas were selected; then, from each area, 10 households were randomly selected and one eligible woman (between ages 18-44) was randomly selected from each household and invited to participate in the study. For the rural site, stratified cluster random sampling was employed to select 150 out of 1,450 listed farms across 3 municipal areas of the Province. On each farm, all women of eligible age (18-44 years) were invited to take part in the study. A total of 606 women were interviewed in Gauteng and 412 in Western Cape. The response rates were 74% and 83%, respectively. Fieldworkers administering the survey were trained by the researchers to have the skills and attitudes to appropriately recruit the women and carry out the interviews. Extra sensitivity training was given due to the potential sensitive nature of the alcohol related questions.

Measures

A household survey was used to collect respondents' socio-demographic information, psychosocial factors, drinking and smoking patterns and use of reproductive health services. Alcohol use questions pertinent to this study included measures of current alcohol use, problematic drinking and binge

drinking as identified through the Alcohol Use Identification Test ([AUDIT]; Babor et al., 2001). After obtaining written consent, trained fieldworkers conducted face-to-face interviews at participants' homes.

Dependent Variables

Current drinking. This was defined as a dichotomous variable in response to the survey question "How often do you have a drink containing alcohol?" Respondents who had consumed alcohol at least one day in the last month were assigned "1" for current drinker. Respondents who had not had a drink in the last month were assigned "0" for not a current drinker. Only respondents who were current drinkers were included in the analysis. The problematic, non-problematic, binge and non-binge drinking variables were derived only from this subsample of current drinkers in the study.

Problematic drinking. This was measured by the ten-item Alcohol Use Identification Test (AUDIT). Women who were current drinkers with scores of eight or more were assigned "1" for problematic drinking. Women who were current drinkers with scores of seven and below were assigned "0" for non-problematic drinking. Scores of 8 and more indicate problematic drinking because the level and pattern of drinking puts the individual at risk for or can incur harmful alcohol-related consequences (Babor et al., 2001).

Binge drinking. This was derived from the AUDIT question "How often do you have six or more drinks on one occasion?" Current drinking respondents with answers of "*0-less than monthly", "1-monthly", "2-weekly", "3-daily"* or *"4-almost daily"* were assigned "1" for binge drinking. Current drinkers with answers of "*never*" were assigned "0" for non-binge drinking. One drink was defined as equivalent to one can or bottle of beer, cider or coolers, one glass of wine, or one tot of spirits. The cut-off for binge drinking was based on the WHO recommendation that even a score of 1 on this question indicates the respondent is at risk for alcohol-related problems (Babor et al., 2001).

Independent variables

The independent variables were psychosocial and demographic variables and mostly measured by binary scales.

Sociodemographics. Age was categorised into three groups: 18-24, 25-34 and 35-44 years. Education level was dichotomised into having a general education "0", defined as completing grade 1 to 9, versus completing further and/or higher studies "1". Marital status was dichotomised into married (legally and traditionally) or living with partner "1" versus not married or living with partner "0". Participants self-identified into 'race' groups: 'black/African', 'coloured', 'white' and 'Asian/Indian'. Employment status was dichotomised into employed, defined by having full- or part-time work or being self-employed "1" versus unemployed, defined as not having any form of employment "0". Socioeconomic status (SES) was determined from the number of amenities and commodities a respondent owned (electricity, a radio, a television, a telephone, a fridge, a computer, a washing machine and a cellular telephone). High SES was defined as owning five or more items "1" versus low SES, defined as possessing less than five "0".

Self-esteem. Participants completed the ten-item Rosenberg (1965) Self-esteem Scale (RSE) which assessed global self-esteem (e.g. "on the whole, I am satisfied with myself"). The measure was rated on a four-point scale ranging from *Strongly agree (1) to Strongly disagree (4)*. Negatively worded questions were reverse coded. Scores were summed and dichotomised across the 75th percentile to denote high "0" versus low to moderate self-esteem "1". Self-esteem was categorised in this way because I was interested in exploring the association between low self-esteem and adverse drinking outcomes. This was my association of interest because it has been argued that individuals with low self-esteem are predisposed to adopt risk behaviours (Wild et al., 2008). The RSE was the most widely utilized instrument for measuring global self-esteem (Schmitt & Allik, 2005). A study that administered the RSE to 53 nations reported an

average Cronbach's alpha of 0.81, signifying good internal reliability across many cultures and languages (Schmitt & Allik, 2005). Several studies reported the RSE to have good validity as it has significantly correlated with many other measures of self-esteem (Blasovich & Tomaka, 1991; Robin, Hendin, & Trzesniewski, 2001). A study of pregnant HIV positive women conducted in the same urban area as this study reported a Cronbach's alpha of 0.75 (Mundell et al., 2011).

Mental health. Mental health referred to the amount of depression, anxiety, and psychologic well-being during the past month (O'Keefe & Wood, 1996). This was defined as a dichotomous variable and derived from a five-item subsection of the MOS Short-Form-General Health Survey (Stewart et al., 1988). Answers on the scale were rated from *All of the time (1)* to *None of the time (6)*. Negatively worded questions were reverse coded. Mental health scales were scored by summing the item responses. Scores were transformed linearly to 0-100 scales, with 0 as the lowest and 100 as the highest possible score. Scores of 67 or lower were assigned "1" for poor mental health and scores above 67 were assigned "0" for good mental health. The MOS SF-36 has been used widely internationally and is known as an accepted measure to be used with diverse groups (Ware & Sherbourne, 1992). Stewart, Hays, and Ware (1988) tested the instrument in several urban areas amongst different adult populations in the United States and reported a Cronbach's alpha of 0.88 for the five-item mental health subsection. The results also tendered support for the validity of the instrument. For South African populations, two studies offer data on the reliability and validity of the measure. A validation study of a Xhosa and Afrikaans translated version of the MOS SF-36 administered to HIV positive adults in Cape Town reported good overall reliability and concurrent validity on the mental health scale. However, kappa values for some of the questions referring to mental health were poor (O'Keefe & Wood, 1996). Ncama et al. (2008) administered an isiZulu translated version to a majority female HIV positive sample in KwaZulu-Natal, and reported a Cronbach's alpha of 0.72 for the mental health subsection. No validity data was given.

Social Support. Social support represented the functional aspect of interpersonal relationships. That is to say, the extent to which interpersonal relationships served particular functions in an individual's life. The functions of support break down in to four components which consist of (1) *emotional* (caring, loving, and empathy/*informative* (offering of advice, information or guidance), (2) *tangible* (provision of material aid or behaviour assistance), (3) *positive social interaction* (availability of other persons to do fun things with), and (4) *affectionate* (involving expressions of love and affection/behavioural manifestations of love) (Sherbourne & Stewart, 1991). Fourteen items from the Rand Medical Outcomes Study (MOS) Social Support survey (Sherbourne & Stewart, 1991) were used to measure the perceived availability of three functional aspects of social support: emotional/informative, affectional and positive social interaction. The tangible support scale was omitted due to duplication with the Social Capital Scale. Responses were chosen from a Likert-type scale which ranged from *None of the time (1)* to *All of the time (5)*. Scores were summed and dichotomised across the 75th percentile, into weak "1" versus strong "0" social support**.** The variable was categorised in this way because I was interested in exploring the relationship of a lack of perceived availability of the measured functions of support with problematic and binge drinking outcomes. An evaluation of the instrument conducted by Stewart and Sherbourne (1991) in diverse populations in the United States demonstrated the reliability of the scales (Cronbach's alpha > 0.91; One-year test/retest alpha =0.78) and high convergent and discrimination validity. In the aforementioned study conducted by Ncama et al. (2008) in KwaZulu-Natal, the investigators reported a Cronbach's alpha of 0.64 for the MOS Social Support Survey indicating moderate reliability. Again, no validity data was provided. Westaway, Seager, Rheeder, and Van Zyl (2007) administered the survey to 'black' diabetes mellitus outpatients who were mostly women in Pretoria, South Africa. The researchers reported a Cronbach's alpha of 0.97 for the full scale, deemed an excellent reliability coefficient. Validity analyses lent support for the scales construct and discriminate validity. Two other studies have utilized

the survey with South African populations. Gaede et al. (2006) administered it to women living with HIV in an urban and rural setting and Kornblith et al. (2003) in a follow-up study of white women who had survived cancer.

Social Capital. Social capital denoted the characteristics of social relationships—such as levels of interpersonal trust and norms of reciprocity and mutual aid—that facilitate collective action for mutual benefit (Kawachi, 1999). This was measured by a six-item Likert scale with four answer categories which ranged from *Strongly agree (0)* to *Strongly disagree (4)*. Negatively worded questions were reverse coded. Scores were summed and dichotomised across the 75th percentile, into weak "1" versus strong "0" social capital. I categorised the variable in this way because I was interested in investigating if lower stocks of social capital increased the odds of problem and binge drinking. This scale was adapted by Martin, Rogers, Cook and Joseph (2004) from an instrument developed and validated by Sampson, Raudenbush, and Earls (1997) to measure social cohesion and trust. The measurement instrument developed by Sampson et al. (1997) was known for being one of the most widely quoted and copied measures of social capital in the health-related field (Harpham, Grant, & Thomas, 2002).
In this study, the instrument was used as a proxy for subjects' stock of social capital. Sampson et al. (1997) conducted hierarchical statistical models to test for item variation within person, person variation within neighborhoods, and variation between neighborhoods. Discriminant validity was supported and the researchers declared that the instrument could be used reliably. There is a lack of research showing the use of this instrument in South Africa. It was selected for use in this study because it is much shorter than other scales that have been used in South Africa.

Family member with an alcohol problem. This was defined as a dichotomous variable and derived from four *yes/no* survey questions asking if the respondent's mother, father, brother or sister had or has an alcohol problem. Respondents who gave an affirmative response for one or more on any of the

questions were assigned "1" for has at least one family member with an alcohol problem. Those who answered no to all the questions were assigned "0" for does not have any family members with an alcohol problem.

Binge drinking partner. This variable was derived from a survey question asking the respondent how often her current partner consumed six or more drinks on one occasion. There were five responses to choose from: *0-never, 1-monthly or less, 2-monthly, 3-weekly 4-daily or almost daily*. If women had a score of 1 or more, they were ascribed a "1" for having a binge drinking partner. Women who had a score of 0 were assigned a "0" for non-binge drinking partner. The cut-off was based on the WHO recommendation that even a score of 1 on this question indicates the respondent is at risk for alcohol-related problems (Babor et al., 2001).

Statistical analysis

The prevalence rates for various sociodemographic, psychosocial and alcohol consumption characteristics were first calculated for all women, stratified by site. Then, current drinkers were divided into drinking statuses (i.e. problem, non-problem, binge, non-binge) by site and further prevalence rates were calculated. STATA10 software (Stata Corp; College Station, TX) was used to explore the data. Potential confounders were selected based on previous evidence in the literature of having an association with problem or binge drinking patterns in South African women (Ojo et al., 2010; O'Connor et al. 2011). These included sociodemographic variables, indicators of hunger in the household, age of onset of alcohol consumption and smoking. Age was the only variable to be explored as continuous variable. Normality and distribution were assessed with the Shapiro-Wilk test, histograms and box plots. Associations and potential confounders were assessed with Chi-squared tests for categorical variables and the Wilcoxon Sum Rank test for age with the categorical variables. Age was also explored as a

categorical variable in three categories (18-24, 25-34, 35-44) using Chi-squared tests. Since similar results were found, age as a categorical variable was used in regressions for ease in interpretation.

An unstratified analysis with multiple logistic regression was performed to determine the odds of problematic or binge drinking given an urban or rural geographical status. Unadjusted odds ratios and adjusted odds ratios controlling for sociodemographic variables were calculated. This was followed by using multiple logistic regression to build models that would determine a subset of variables that best predicted problematic drinking and binge drinking for drinkers stratified by site. A mixture of forced and manual modeling was used to build four models. To test the study hypothesis, all six psychosocial variables were included in the model; then, to take account of potential confounding, variables suspected of being confounders were added manually with a forward selection method to see which gave the greatest improvement in the prediction, given the variables already in the model. Likelihood-ratio tests, Aikaikes Information Criterion (AIC) and the Pearson chi-squared test were used to assess and compare the relative goodness of fit of the competing models. Confounders were included if they significantly improved the fit of the model. Adjusted odds ratios (AOR) and 95% confidence intervals (95%CI) were estimated. Additionally, an alternative analysis was done to test the study hypothesis using only a manual forward selection method which served to verify the results since the effect estimates were not very different between the two analyses. The alternative models can be found in Appendix 4.

Results

Descriptive statistics

Table 1 presents sociodemographic, psychosocial, and alcohol consumption characteristics for both sites overall and between the dependent variables per site. The average age in the urban site was 30.2 years and 31.0 years in the rural site. All demographic variables were significantly different between the two sites except for age. The number of women in the urban setting who had completed more than 9

grades was almost 6 times that of their rural counterparts, 84.6% and 14.4% respectively. Urban women were more likely to be single or not married (63.5%) versus rural women who were more likely to be married or living with their partner (65.5%). The majority of the urban respondents self-identified as "Black/African" (81.4%), followed by "Coloured" (11.1%), and then "White" (7.5%). The opposite was observed in the rural site where respondents primarily self-identified as "Coloured" (90.8%), then "Black/African" (8.5%). In the urban site, slightly more than half the women were unemployed (58.1%) versus one-fifth (19.9%) in the rural site. There were nearly twice as many rural women with a lower socioeconomic status (SES), identified as having less than 5 amenities, than urban women, 64.2% and 33.6% respectively.

Psychosocial

Significant differences between urban and rural women were observed for: poor mental health (71.9% vs. 25.3%; $p<0.001$), having a binge drinking partner (33.8% vs. 47.1%; $p<0.001$) and the presence of one or more family members with an alcohol problem (32.0% vs. 52.8%). Both sites had similar prevalence rates, around 75% for low self-esteem, low social support and low social capital, which were not significant across the sites.

Drinking patterns

Significant differences were observed across the sites for all the alcohol consumption patterns. There were half as many current drinkers in the urban site 20% (121/606) versus rural site 41% (170/412) ($p<0.001$). Of those current drinkers, significantly less urban women were drinking at problematic levels compared to rural women, (33% or 40/121 versus 73% or 124/170; $p<0.001$). Moreover, 62.8% (76/121) of urban current drinkers and 83.5 % (142/170) of rural current drinkers reported consuming 6 or more drinks in one sitting (defined as binge drinking), a difference that was statistically significant ($p<0.001$).

Those in the rural site had 5.5 (95% CI: 2.2 to 9.1) times the odds of problem drinking versus the urban site. When holding all demographic variables (age, education, ethnicity, employment status, marital status and an indicator of SES) constant, the odds of problem drinking for rural women were 2.4 (95% CI: 0.8 to 7.0) times the odds for urban women; however, the odds ratio was not significant. There were similar results for the odds of binge drinking given urban and rural status. The odds of binge drinking were 3 (95%CI: 1.7 to 5.19) times greater for rural versus urban women. However, when adjusting for demographics, the odds of binge drinking were 1.3 [95% CI: 0.44 to 3.8] times more for rural women versus their urban counterparts, which was not significant.

Drinking status and psychosocial factors

Urban

Women who were current drinkers with problematic and binge drinking patterns were different from their non-problematic and non-binge drinking counterparts on a variety of psychosocial factors. Problematic drinkers had a higher prevalence of low to moderate self-esteem (92.1% vs. 65.8%; p=0.002) and were more likely to have a family member with an alcohol problem (59.0% vs. 24.4%; p<0.001). Similarly, women who engaged in binge drinking behaviour were more likely to have a family member with an alcohol problem versus those who drank but did not binge drink (46.6% vs. 18.2%; p=0.002).

Rural

Current drinkers who drank at problematic levels were more likely to have low to moderate self-esteem (85.7% vs. 64.4%; p=0.002) and have a binge drinking partner (72.6% vs. 45.7%; p<0.001) compared to women who drank at non-problematic levels.

Table 1: Sociodemographic, psychosocial and alcohol consumption characteristics of participants

	Urban site N=606	Rural site N=412	**Non-Problem drinkers**		**Problem drinkers**		**Non-Binge drinkers**		**Binge drinkers**		Chi2 p-value[2] Urban	Chi2 p-value[2] Rural
			Urban N=121	Rural N=170	Urban N=121	Rural N=170	Urban N=121	Rural N=170	Urban N=121	Rural N=170	Problem Binge	Problem Binge
Demographic Variables[1]												
Age (years)												
18-24	30.0	24.8	28.4	23.9	32.5	22.6	24.4	35.7	32.9	20.4		
25-34	38.0	39.1	33.3	37.0	42.5	36.3	26.7	25.0	42.1	38.7		
35-44	32.0	36.2	38.3	39.1	25.0	41.3	48.9	39.3	25.0	40.9	0.339 0.026**	0.961 0.165
Education* **												
≤Grade 9	15.4	85.6	7.4	76.1	17.5	94.3	4.4	74.1	14.5	92.3		
>Grade 9	84.6	14.4	92.6	23.9	82.5	5.7	95.6	25.9	85.5	7.8	0.092# 0.085#	0.001** 0.005*
Marital Status* **												
Married	30.6	30.8	28.4	21.7	22.5	19.4	37.8	7.2	19.7	22.5		
Living with partner	6.0	35.0	2.47	37.0	5.0	46.0	2.2	50.0	4.00	42.3		
Never married/single	58.7	30.3	56.8	34.8	65.0	32.3	48.9	39.3	65.8	31.7		
Divorced/separated/ Widow	4.8	4.1	12.4	6.5	7.5	2.4	11.1	3.6	10.5	3.5	0.624 0.165	0.496 0.320
"Race"* **												
"Black/African"	81.4	8.5	40.7	6.5	80.0	4.8	42.2	10.7	60.5	4.2		
"Coloured"	11.1	90.8	33.3	91.3	20.0	95.2	31.1	85.7	27.6	95.8		
"White"	7.5	0.7	25.9	2.2	0.0	0.0	26.7	3.6	11.8	0.0	.001*** 0.065#	0.231 0.028**
Employment status* **												
Unemployed	58.1	19.9	33.3	13.0	67.5	15.3	28.9	10.7	54.0	15.5		
Employed part-time/self-employed	16.4	35.9	16.1	39.1	25.0	37.9	20.0	50.0	18.4	35.9		
Employed full-time	25.5	44.2	50.6	47.8	7.5	46.8	51.1	39.3	27.6	48.6	.001*** .016**	0.933 ǀ 0.367
Socio-economic status* **												
Five or less amenities	33.6	64.2	7.5	60.9	29.0	79.8	9.1	71.7	17.6	75.4		
Five or more amenities	66.4	35.9	92.5	39.1	71.1	20.2	90.9	28.6	82.4	24.7	0.002** 0.205	0.011* 0.662

Psychosocial Variables[1]												
Self Esteem												
Low/Moderate	78.6	76.7	65.8	64.4	92.1	85.7	72.1	78.6	76.1	80.2		
High	21.4	23.3	34.2	35.6	7.9	14.3	27.9	21.4	23.9	19.9	0.002** 0.638	0.002** 0.850
Mental Health* **												
Poor	71.9	25.3	70.4	13.3	67.5	27.6	64.4	25.0	72.4	23.6		
Good	28.1	74.8	29.6	86.7	32.5	72.4	35.6	75.0	27.6	76.4	0.747 0.361	0.054# 0.871
Social Support												
Low/Moderate	75.8	76.0	66.7	77.3	82.1	80.3	73.2	82.2	70.7	79.0		
High	24.2	24.0	33.3	22.7	18.0	19.7	26.7	17.9	29.3	21.0	0.080# 0.754	0.667l 0.706
Social Capital												
Low/Moderate	75.42	76.24	80.2	76.1	76.3	80.3	77.8	82.1	79.7	78.6		
High	24.58	23.76	19.8	23.9	23.7	19.7	22.2	17.9	20.3	21.4	0.624 0.800	0.546 0.671
Partner binge drinker* **												
No	66.2	52.9	61.7	54.4	45.0	27.4	64.4	50.0	51.3	31.7		
Yes	33.8	47.1	38.3	45.7	55.0	72.6	35.6	50.0	48.7	68.3	0.081# 0.159	.001*** 0.063#
Family member with alcohol problem* **												
None	68.0	47.2	75.6	58.7	41.0	42.2	81.8	59.3	53.4	44.3		
1 or more	32.0	52.8	24.4	41.3	59.0	57.9	18.2	40.7	46.6	55.7	.001*** 0.002**	0.056# 0.153
Alcohol consumption												
Current use***	20.0	41.3										
Problematic drinking***	33.1 (40/121)	73.0 (124/170)										
Binge drinking***	62.8 (76/121)	83.5 (142/170)										

[1]Chi-squared test between 2 sites on all variables; [2] Chi-squared test between drinking variables for sociodemographic and independent variables
p-value: *p<0.05; **p<0.01; ***p<0.001; #p<0.10

Multivariate regression models

The psychosocial factors and their associations with drinking outcomes for both sites can be found in Table 2.

Urban

- Model 1: *Outcome variable*: problematic drinking; *predictor variable*: family member with an alcohol problem; *confounders*: socioeconomic status (SES) and employment status: *significance level*: $p<0.05$
- Model 2: *Outcome variable*: binge drinking; *predictor variable*: family member with an alcohol problem; *confounders*: onset of alcohol consumption before the age of 18, ethnicity and smoking: *significance level*: $p<0.05$

Rural

- Model 3: *Outcome variable*: problematic drinking; *predictor variable*: binge drinking partner; *confounders*: education level; *significance level*: $p<0.05$
- Model 4: *Outcome variable*: binge drinking; *predictor variable*: no variables; *confounders*: education level; *significance level*: $p<0.05$

Table 2: Logistic regression models for problematic & binge drinking in urban & rural sites

	URBAN		RURAL	
	Problem	Binge	Problem	Binge
	Model 1 AOR (95% CI)	Model 2 AOR (95% CI)	Model 3 AOR (95% CI)	Model 4 AOR (95% CI)
Self-Esteem				
High	1.00	1.00	1.00	1.00
Low/Mod	3.81	0.34	2.45*	0.83
	(0.88-16.61)	(0.10-1.17)	(0.98-6.13)	(0.27-2.56)
Mental Health				
Good	1.00	1.00	1.00	1.00
Poor	0.56	0.85	1.44	0.74
	(0.18-1.73)	(0.30-2.41)	(0.50-4.12)	(0.25-2.18)
Social Support				
Strong	1.00	1.00	1.00	1.00
Weak	1.56	0.52	1.21	1.08
	(0.47-5.10)	(0.17-1.63)	(0.47-3.13)	(0.35-3.32)
Social Capital				
Strong	1.00	1.00	1.00	1.00
Weak	0.59	1.49	1.10	1.13
	(0.17-2.10)	(0.46-4.83)	(0.41-2.91)	(0.37-3.47)
Binge drinking partner				
No	1.00	1.00	1.0	1.00
Yes	1.68	1.20	**3.02****	2.37*
	(0.61-4.59)	(0.46-3.13)	**(1.38-6.64)**	(0.97-5.77)
Alcohol problem in 1+ family member				
No	1.0	1.0	1.00	1.00
Yes	**2.88****	**3.87****	1.74	1.86
	(1.01-8.18)	**(1.31-11.40)**	(0.78-3.87)	(0.74-4.69)

p<0.05;** *p<0.10 CI: confidence interval; AOR: adjusted odds ratio

Urban

The presence of an alcohol problem in at least one immediate family member was the only variable to be associated with the dependent drinking variables in the urban site. The odds of problematic drinking were 2.88 (95% CI: 1.01-8.18) times greater among drinking women who had a family member with an alcohol problem versus those who did not, controlling for SES and employment status. The odds ratio for the association between low self-esteem and problem drinking was elevated (AOR=3.81; 95%CI: 0.88-16.6) but was not statistically significant. Drinking women with a family member with an alcohol problem had 3.87 (95% CI: 1.13-11.40) times the odds of binge drinking compared to those who did not, controlling for onset of alcohol consumption before the age of 18, ethnicity and smoking. The odds ratio for the association between low social capital and binge drinking was elevated (AOR=1.49; 95%CI: 0.88-16.6) but was not statistically significant.

Rural

The odds of problem drinking were 3.02 (95%CI 1.35-6.54) times greater for drinking women who had a binge drinking partner versus those who did not. The odds ratio for the association between low self-esteem and problem drinking, controlling for education, was elevated (AOR=2.45; 95% CI: 0.98-6.13) but was just marginally non-significant. The odds ratio for the association between poor mental health and problem drinking was elevated (AOR=1.44; 95%CI: 0.50-4.12) but was not statistically significant. Similarly, the odds ratio for the association between binge drinking and having a binge drinking partner was elevated (AOR=2.37; 95% CI: 0.97-5.77) but was not significant. The odds ratio for was elevated for having a family member with a drinking problem and binge drinking (AOR=1.86; 95%CI: 0.74-4.69), however this was not significant.

Discussion

The drinking rates reported in this study parallel other findings of problematic and binge drinking patterns in these areas (Shisana et al., 2005; Shisana et al., 2008). Together, these findings reveal there is more harmful alcohol use among women in these regions compared to other areas of South Africa, especially in the Western Cape. Explanations for why there is more alcohol consumption in the Western Cape could be explained by a existent pervasive 'alcohol culture;' most likely remnant of a colonial practice of using alcohol to pay workers, known as the DOP system (London, 2000). Moreover, the Western Cape is the wine-producing region of South Africa and where the majority of wine farm workers live in impoverished areas with low educational attainment and access to resources. While the rural site had more binge drinkers, binge drinking rates amongst drinkers were high for both sites. Problem and binge drinkers in the urban site were more likely to be unemployed as compared non-problem and non-binge drinkers. Possibly, a way to cope with the stresses of unemployment was by seeking relief in an alcohol binge.

This study compared psychosocial factors of women who engage in problematic and binge

drinking to those of women who currently drink alcohol at safe levels and compared them across rural and urban settings. The drinking patterns present in the social environment surrounding the study women emerged as having the strongest associations with problem and binge drinking. In addition, women who reported problematic and binge drinking were more likely to have low/moderate self-esteem than their moderate drinking counterparts. Research has shown an association between low self-esteem and alcohol problems (Silverstone & Salsali, 2003). What was interesting though was that more women with problematic drinking reported low/moderate self-esteem than binge drinking women and particularly in the urban setting. One explanation for this difference may lie in the intersection of ethnicity, gender and discrimination. While apartheid is no longer upheld legally, there remains a culture of racial hierarchy and sexism with "black/African" women historically at the bottom and "coloured" women marginally better off (Outwater, Abrahams, & Campbell, 2005). A study examining discrimination and health in South Africa reported "black" groups (African, coloured and Indian) in South Africa were two to four times more likely than "whites" to report acute and chronic experiences of racial discrimination (Willams et al., 2008). Discrimination in the form of racism and sexism has been shown to cause psychological distress and to have an inverse relationship with self-esteem (Utsey & Ponterotto, 2000). Being seen as inferior in society and in turn internalizing the notion can have profound implications on a woman's perception of her value and competency-her self-esteem. Chronic discrimination may lead to persistent drinking as oppose to spurts of drinking which may explain the higher prevalence of low/moderate self-esteem in problematic drinking women versus binge drinking ones. In the rural study site, participants were predominately self-identified as "coloured", while in the urban site, participants were predominately "black/African." Considering the historical legacy of gender and racial inequality for women of "black/African" descent could explain why the prevalence was so much higher in the urban study site.

Moreover, similar to both locations regardless of drinking level or pattern was a high prevalence of low social support, low social capital, and low self-esteem. This finding is telling of the poor psychosocial environments which might be quite common for women in these areas. At the same time, women in the rural area were significantly more likely to have good mental health. This information could provide a basis for further investigations to inform more targeted prevention and intervention strategies.

Differential geographical areas, that is being in an urban or rural area, affected the associations between psychosocial factors and drinking behaviour. Rural problem and binge drinkers differed from rural drinkers in ways that were dissimilar to the ways in which urban problem and binge drinkers differed from urban drinkers. Rural problem and binge drinking women were more likely to have a binge drinking partner while urban women were more likely to have a family member with a drinking problem. While the direction of the influence is difficult to infer, the results support the notion that the social environment is an important factor related to harmful alcohol use. This is not surprising given similar findings on the influence of interpersonal relationships on alcohol consumption (Rosenquist et al., 2010; Ojo et al., 2010; Demers et al., 1999). Alcoholic parents can shape the social norms children have about drinking and model abusive alcohol behaviour. Patriarchal homes, gender roles, low levels of empowerment and self-esteem can affect a women's susceptibility for problematic drinking influence. This is especially the case in impoverished areas such as the Western Cape.

Limitations

This was a cross-sectional study so causal associations cannot be determined. As a result, one cannot discern if low psychosocial indicators cause problem drinking or if it is the other way around. Also, alcohol consumption behaviour was self-reported and therefore may be subject to reporting bias. Since alcohol consumption and personal psychological characteristics are sensitive

subjects, certain respondents may have been swayed to answer in more socially desirable ways. However, reports of drinking levels are more likely to be underestimated. The study sought to examine differences in current drinkers to those engaging in harmful alcohol practices; therefore, no comparisons were made with women who do not drink at all. Such a comparison could have elucidated differences in women who drink and women who do not, an important comparison given the higher rates of non-drinkers in the sites. Researching psychosocial factors in South African women who do not drink versus those who do could help to find potentially protective factors to alcohol use. Social networks can be bi-directional therefore just as binge drinkers can influence other's drinking behaviour in negative ways, those who do not drink can affect other's drinking behaviour in positive ways (Rosenquist et al., 2010).

Moreover, this study may have been suffering from lack of power to determine certain associations, especially among binge drinkers and non-binge drinkers, because of the use of a smaller sample size of current drinkers only. It should be noted that the baseline study was designed with a different hypothesis in mind than the one in this study which also might contribute to a potential under-powering of the study. Many potential confounders were controlled for, but there may be other confounders influencing the associations, as well as residual confounding. While the Gauteng study site is likely to be similar to other urban areas in South Africa, the Western Cape site is unique as a wine producing region; therefore, it probably differs from other rural farming areas that do not produce wine. Additionally, there was a relatively low response rate for women in the previously 'white' communities in the Gauteng site. Consequently, generalizing the results to other rural areas and 'white' women beyond the Gauteng study site should be done with caution.

This study used an non sex-specific AUDIT threshold value of 8 and above and having consumed "6 or more" drinks in one sitting to identify women with problematic and binge drinking respectively. The AUDIT and its definitions were used because the AUDIT is the most

internationally validated alcohol use questionnaire for diverse settings and cultures (Reinert & Allen, 2007). However, alcohol screening questionnaires have been shown to have lower sensitivities in women versus men at the same cut-off points (Bradley et al., 1998). Henceforth, and as recent research suggests, using a lower AUDIT cut-off value for women may have achieved a better balance of specificity and sensitivity for the study (Reinert & Allen, 2007). As to which threshold value will most effectively classify problematic drinking in women is a contentious area in the field (Gache et al., 2005, Neumann et al., 2004). In addition, Bradley et al. (1998) stated that because women typically report elevated psychosocial problems at lower levels of consumption than men,the AUDIT question pertaining to binge drinking might be more effective at identifying binge drinking in women if it would ask about the frequency of drinking "4 or more" in place of "6 or more" drinks. Four drinks or more is a more widely accepted definition of binge drinking for women (Jackson, 2008). Considering the possibility the AUDIT thresholds employed may be less sensitive for women, this study may have misclassified individuals who had problematic drinking and binge drinking as drinking at safe levels. Consequently, the prevalence of problematic and binge drinking in these areas may have been under-reported and potential associations undetected. There is a relative lack of research on the validity of alcohol screening questionnaires for women, especially in South Africa. More South African sex-specific evaluations are needed to determine the optimal tests and thresholds for identification of problematic and binge drinking in South African women.

There are very few measures designed to assess psychosocial constructs in the diverse ethnic landscape of South African women. An instrument designed to measure the constructs in a cultural setting in one country may not be appropriate for the use in South African contexts since, for example, perceptions of self-esteem may be understood differently across cultures. Consequently, the measures used in this study had to be adapted and translated to fit the South African context,

which may have affected the reliability or validity of the instrument. With that said, several of the measures used in this study had been translated and used in female study samples in South Africa previously and reported good reliability and validity statistics. While the measure used for social capital derived from one of the most widely used measures, it was not locally pre-tested and adapted as suggested by Harpham et al. (2002) as a necessary act to make the tool culturally appropriate. Such an adaptation could have affected the responses received from the Social Capital Scale.

Implications

Public health interventions that take into consideration psychosocial environments as well as geographic locations may prove to be effective in decreasing the prevalence of problematic and binge drinking patterns among women in South Africa. These results support the need for the scope of prevention and treatment programs to reach beyond the individual, and take into consideration the various influences which create the fabric of formative relationships and social structure for drinking women. Psychosocial factors, as highlighted in this study, demonstrate the importance of unraveling existing social networks in an effort to understand more completely the driving influences of alcohol consumption among women. Clinicians, social workers and community health workers should work to connect women to more supportive and positive networks such as support groups or community centers.

This study of women's psychosocial factors, alcohol consumption patterns and the associations between them in a rural Western Cape and urban Gauteng area of South Africa has added to the knowledge base around risk factors for the overconsumption of alcohol among women in this part of the world. More research is needed to tease out the complex relationship between psychosocial risk factors and alcohol consumption behaviour. To strengthen evidence of causal relationships of psychosocial factors to alcohol problem patterns, more longitudinal research is

needed. Studies are needed to further evaluate the role of family member's drinking problems on drinking practices among women in South Africa. It would be worthwhile to examine which familial drinking patterns and relationships bear the most influence on women's drinking, and if there are protective elements to family influence. More research is needed to clarify the associations between partner drinking habits as well as better evaluate the direction of influence.

Conclusions

The results show that drinking patterns in close relationships, low self-esteem and geographical influences are significantly different between women who engage in problematic and binge drinking practices compared to those who do not. Tailored interventions to prevent problematic alcohol use behaviour from developing in women are needed that take into consideration relational influences, low self-esteem and differential geographical influences.

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Appendices

Appendix 1

PARTICIPANT INFORMATION LEAFLET AND INFORMED CONSENT:

Household survey respondent

(Each participant must receive, read and understand this document before the start of the study)

STUDY TITLE

Comprehensive Fetal Alcohol Syndrome Prevention Programme in the Western Cape and Gauteng

INTRODUCTION

You are invited to volunteer for a research study. This information leaflet is to help you to decide if you would like to participate. Before you agree to take part in this study you should fully understand what is involved. If you have any questions, which are not fully explained in this leaflet, do not hesitate to ask the investigator. You should not agree to take part unless you are completely happy about all the procedures involved.

WHAT IS THE PURPOSE OF THIS STUDY?

The main purpose of the study is to explore women's knowledge, attitudes and practices about drinking during pregnancy and the use of family planning. During the study you will be interviewed. In other words, you will be asked questions about yourself, your employment, your relationship with other people, your attitudes, feelings and behaviour with respect having children and the use of alcohol. Please note that you have the right to read through the questionnaire before deciding whether or not you want to participate in the study.

WHAT IS THE DURATION OF THIS STUDY?

If you decide to take part you will be one of approximately 750 people being interviewed. The entire study will last for up to three years during which time you will be interviewed on one further occasion. This interview should last for about one hour.

HAS THE STUDY RECEIVED ETHICAL APPROVAL?

The study Protocol was submitted to the Faculty of Health Sciences Research Ethics Committee of the University of Pretoria and written approval has been granted by that committee. The study has been structured in accordance with the Declaration of Helsinki (last update: October 2000), which deals with the recommendations guiding doctors in biomedical research involving human/subjects. A copy of which may be obtained from the investigator should you wish to review it.

WHAT ARE MY RIGHTS AS A PARTICIPANT IN THIS STUDY?

Your participation in this study is entirely voluntary and you can refuse to participate or stop at any time without stating any reason. You can also withdraw your consent at any time, before, during or at the end of the interview.

MAY ANY OF THESE STUDY PROCEDURES RESULT IN DISCOMFORT OR INCONVENIENCE?

You may feel uncomfortable about answering some of the questions as they deal with some sensitive issues. For this study we will ask you some sensitive questions concerning the use of alcohol, pregnancy and having children. If you do feel uncomfortable about answering certain questions you may decline to do so. The questions will be asked in a language that you understand.

WHAT ARE THE RISKS INVOLVED IN THIS STUDY?

The only potential risk involved in this study is the chance that you may feel uncomfortable when answering some of the sensitive questions on alcohol use and child bearing.

WHAT ARE THE BENEFITS INVOLVED IN THIS STUDY?

This study will provide a better understanding of women's knowledge, attitudes and views on alcohol use during pregnancy. The information that is gained from this study will be useful for policies and programmes aimed at preventing alcohol misuse, especially in pregnancy, among people in communities.

SOURCE OF ADDITIONAL INFORMATION

The project manager for the overall duration of the study is Ms. Kirstie Rendall-Mkosi. If at any time during the study you feel uncomfortable as a result of answering questions in the interview or you have any questions, please do not hesitate to contact her. The telephone number at which she can be reached is (012) 841-3291.

CONFIDENTIALITY

The interviews will take place in private. All information obtained during the course of this study is strictly confidential. The questionnaires will all be stored in a locked filing cabinet in the office of the Principal Investigator (Ms. Kirstie Rendall-Mkosi) at the University of Pretoria when not in use. The research material will only be seen by members of the research team. Results of the study that may be reported in scientific journals will not include any information which identifies you as a participant in this study, or this community as the study site.

INFORMED CONSENT

I hereby confirm that I have been informed by the investigator, Ms. Rendall-Mkosi, or her associate, about the nature, conduct, benefits and risks of the study. I have also received, read and understood the above written information (Participant Information Leaflet and Informed Consent) regarding the study.

I am aware that the results of the study, including personal details regarding my sex, age, date of birth, initials, and address will be anonymously processed into a study report.

I may, at any stage, without prejudice, withdraw my consent and participation in the study. I have had sufficient opportunity to ask questions and (of my own free will) declare myself prepared to participate in the study.

Participant's name _____ (Please print)

Participant's signature _____ Date _____

Investigator's name _____ (Pease print)

Investigator's signature _____ Date _____

I, Ms. Rendall-Mkosi, herewith confirm that the above participant has been informed fully about the nature, conduct and risks of the above study.

Witness's name* _____ (Please print)

*Consent procedure should be witnessed whenever possible.

Witness's signature _____ Date _____

VERBAL PARTICIPANT INFORMED CONSENT

(applicable when participants cannot read or write)

I, the undersigned, Ms. Rendall-Mkosi/Delegate have read and have explained fully to the participant, named …….. and/or his/her relative, the participant information leaflet, which has indicated the nature and purpose of the study in which I have asked the participant to

take part. The explanation I have given has mentioned both the possible risks and benefits of the study. The participant indicated that he/she understands that he/she will be free to withdraw from the study at any time for any reason and there will be no negative consequences associated with not participating in the study.

I hereby certify that the participant has agreed to participate in this study.

Participant's Name _____ (Please print)
Investigator's Name _____ (Please print)
Investigator's Signature _____ Date _____
Witness's Name _____ (Please print)
Witness's Signature _____

Appendix 2

Household survey from baseline study

WOMEN, PREGNANCY AND HEALTH

QUESTIONNAIRE

Questionnaire Number	
Interviewer Number	
Community Number	

University of Pretoria

MRC SOUTH AFRICA

UNIVERSITY OF CAPE TOWN

TIME NOW: _____

DATE: _____

GENERAL INSTRUCTIONS

We will work through the questionnaire as follows: All your answers will be marked in my copy of the questionnaire. I will ask the questions and give you the answer choices. You will have a copy of the questionnaire so that you can follow along. Pick the answer that is the closest to how you feel. Usually I will want you to tell me the number that goes with the answer you pick. The interview will take between forty five minutes and one hour to complete.

Please note that there are no right or wrong answers to the questions asked. Please feel free to answer just what you think. If there are questions you really do not want to answer, you may skip them.

PLEASE REMEMBER THAT YOUR NAME WILL NOT BE PUT ON THIS QUESTIONNAIRE. Your answers will not be shared with anyone. Only the research staff will have access to the questionnaire once it has been completed.

Thank you for helping us with this study.

Section 1: Demographic Characteristics

First we would like to ask you a few questions about yourself.

Throughout the questionnaire, please circle the correct response.

1.1 How old are you? _____years

1.2 What is the highest level of education you have passed?

• Less than one year completed	1
• Sub A/Class 1/Grade 1	2
• Sub A/Class 2/Grade 2	3
• Standard 1/Grade 3	4
• Standard 2/Grade 4	5
• Standard 3/Grade 5	6
• Standard 4/Grade 6	7
• Standard 5/Grade 7	8
• Standard 6/Grade 8	9
• Standard 7/Grade 9	10
• Standard 8/Grade 10	11
• Standard 9/Grade 11	12
• Standard 10/Grade 12	13
• Further studies – incomplete	14
• Diploma/other post school – complete	15
• Degree	16

1.3 What is your current marital status?

• Legally married	1
• Traditionally married	2
• Living with man or woman in	3
• Never married/Single	4
• Divorced	5
• Married but separated	6
• Widow	7

1.4 Which of the following is the main language spoken at home? (Please circle only one)

English	
Afrikaans	
IsiXhosa	
IsiZulu	
SeSotho	
SeTswana	
SePedi	
SiSwati	
TshiVenda	
Zitsonga	
IsiNdebele	
Other (Please specify)	

1.5 Which race group do you consider yourself to belong to?

Black/African	1
Coloured	2
White	3
Asian/Indian	4
Other (Please specify)	5

Section 2: Economic factors

Now we would like to ask a few questions about you, your work and the money that is available to you to spend.

2.1 Have you done any paid work in the last 12 months?

N	0
Y	1

2.2 Which of the following describes your current employment status?

Unemployed	1
Employed part-time	2
Employed full-time	3
Self-employed	4

2.3 What kind of work do you do? (If working, please tell me your occupation. For example, plumber, street trader, cattle farmer, primary school teacher, domestic worker)

Not working	0
Working (Please specify)	1

2.4 If you are not working, how do you spend your free time when other people are at work?

2.5 Please indicate which of the following are your sources of income. Please answer this question whether or not you are working.

			N
	Work		0
	Spouse/partner		0
	Parents		0
	Brothers and/or sisters		0
	Children		0
	Child Support Grant		0
	State Old Age Pensions		0
	Disability Grant		0
	Care Dependency Grant		0
	Foster Care Grant		0
	Grants-in-Aid		0
	Workman's Compensation Fund		0
	Other (Please specify)		0

Section 3: Household factors

3.1 Is the house you live in:

Owned by your family	1
Rented	2
Owned by farmer	3
Other (please specify)	4

3.2 How many rooms are there in the house?

Rooms

3.3 How many bedrooms are there in the house?

Bedrooms

3.3 How many bathrooms are there in the house?

Bathrooms

3.5 Does your house have:

	Y	N
Electricity	1	0
A radio	1	0
A television	1	0
A telephone	1	0
A fridge	1	0
A computer	1	0
A washing machine	1	0
A cell phone (anybody)	1	0

3.6 Which of the following live in the same household with you?

	Y	N
Live alone	1	0
Husband	1	0
Partner	1	0
Child or Children	1	0
Brother(s) and/or sister(s)	1	0
Mother/Female guardian	1	0
Father/Male guardian	1	0

•	• Grandparent(s)	• 1	• 0	•
•	• Other (please specify)	• 1	• 0	•

3.7 How many people usually live and sleep in your household?

•	• Number of people

3.8 Let us speak about your household and what it can afford. How often do the people here go hungry or have no food to eat?

• Neve	•
• Seldo	•
• Some	•
• Often	•

• 3.9 Your family has enough money for:

•	•	• Ne ver	• So me- • ti mes	• Al ways	• No t Applicable
•	• Buying food	• 0	• 1	• 2	• 9
•	• Paying for transport (bus, taxi, train fare, petrol bills)	• 0	• 1	• 2	• 9
•	• Paying bills (rent, light, water, telephone, etc.)	• 0	• 1	• 2	• 9
•	• Paying doctors and for medicine	• 0	• 1	• 2	• 9
•	• Buying school supplies, uniforms, books, shoes	• 0	• 1	• 2	• 9
•	• Buying clothes	• 0	• 1	• 2	• 9
•	• Buying firewood, coal, paraffin	• 0	• 1	• 2	• 9
•	• Paying for funerals and other ceremonies/festivities	• 0	• 1	• 2	• 9

Section 4: Community

4.1 For how long have you lived in this community?

•	• Years
•	• Month

Please indicate the extent to which you agree with the following statements about your community.

•	•	• Str ongly Agree	• M oderately Agree	• Ne ither Agree Nor Disagree	• M oderately Disagree	• Str ongly Disagree
• .2	• There are many recreational facilities in your community	• 0	• 1	• 2	• 3	• 4
•	• You can easily use the	• 0	• 1	• 2	• 3	• 4

.3	recreational facilities in your community					
• .4	• It is easy for you to buy alcohol in your community if you want to	• 0	• 1	• 2	• 3	• 4
• .5	• A lot of people drink heavily in your community	• 0	• 1	• 2	• 3	• 4
• .6	• Your community accepts the abuse of alcohol	• 0	• 1	• 2	• 3	• 4
• .7	• There are many advertisements of alcoholic drinks in your community	• 0	• 1	• 2	• 3	• 4
• .8	• People around here are willing to help their neighbours	• 0	• 1	• 2	• 3	• 4
• .9	• This is a close-knit or tight neighbourhood where people generally know each other	• 0	• 1	• 2	• 3	• 4
• .10	• If you had to borrow R100 in an emergency, you could borrow it from a neighbour	• 0	• 1	• 2	• 3	• 4
• .11	• People in this neighbourhood generally don't get along with each other	• 0	• 1	• 2	• 3	• 4
• .12	• People in this neighbourhood can be trusted	• 0	• 1	• 2	• 3	• 4
• .13	• If you were sick you could count on your neighbours to shop for groceries for you	• 0	• 1	• 2	• 3	• 4
• .14	• People in this neighbourhood do not share the same values	• 0	• 1	• 2	• 3	• 4

Section 5: Your feelings about yourself

Below is a list of statements dealing with your general feelings about yourself. Please indicate the extent to which you agree with each statement.

		Strongly agree	Agree	Disagree	Strongly disagree
5.1	On the whole, I am satisfied with myself	1	2	3	4
5.2	At times, I think I am no good at all	1	2	3	4
5.3	I feel that I have a number of good qualities	1	2	3	4
5.4	I am able to do things as well as most people	1	2	3	4
5.5	I feel I do not have much to be proud of	1	2	3	4
5.6	I certainly feel useless at times	1	2	3	4
5.7	I feel that I am a person of worth, at least on an equal plane with	1	2	3	4

	others				
5.8	I wish I could have more respect for myself	1	2	3	4
5.9	All in all, I am inclined to feel that I am a failure	1	2	3	4
5.10	I take a positive attitude towards myself	1	2	3	4

Section 6: Health

6.1 In general, would you say your health is:

• Excellent	• 1
• Very Good	• 2
• Good	• 3
• Fair	• 4
• Poor	• 5

•

• 6.2 For how long (if at all) has your health limited you in each of the following activities? Please choose one number on each line.

•

		• Limited for more than 3 months	• Limited for 3 months or less	• Not limited at all
•	• The kinds or amounts of vigorous activities you can do, like lifting heavy objects, running or participating in strenuous sports	• 1	• 2	• 3
•	• The kinds or amounts of moderate activities you can do, like moving a table, carrying groceries	• 1	• 2	• 3
•	• Walking uphill or climbing a flight of stairs	• 1	• 2	• 3
•	• Bending, lifting or stooping	• 1	• 2	• 3
•	• Taking a ten-minute walk	• 1	• 2	• 3
•	• Eating, dressing, bathing or using the toilet	• 1	• 2	• 3

•

• 6.3 How much bodily pain have you had during the past 4 weeks?

•

• None	• 1
• Very Mild	• 2
• Mild	• 3
• Moderate	• 4
• Severe	• 5
• Very Severe	• 6

•

• 6.4 Does your health keep you from working at a job, doing work around the house or going to school?

•

• Yes, for more than 3 months	• 1
• Yes, for 3 months or less	• 2
• No	• 3

6.5 Have you been unable to do certain kinds or amounts of work, housework or schoolwork because of your health?

Yes, for more than 3 months	1
Yes, for 3 months or less	2
No	3

For each of the following questions, please choose the number for the one answer that comes closest to the way you have been feeling during the past month.

		All of the time	Most of the time	A good bit of the time	Some of the time	A little of the time	None of the time
6.6	How much of the time, during the past month, has your health limited your social activities (like visiting friends or close relatives)?	1	2	3	4	5	6
6.7	How much of the time, during the past month, have you been a very nervous person?	1	2	3	4	5	6
6.8	During the past month, how much of the time have you felt calm and peaceful?	1	2	3	4	5	6
6.9	How much of the time, during the past month, have you felt downhearted and blue?	1	2	3	4	5	6
6.10	During the past month, how much of the time have you been a happy person?	1	2	3	4	5	6
6.11	How often, during the past month, have you felt so down in the dumps that nothing could cheer you up?	1	2	3	4	5	6

6.12 Please choose the number that best describes the extent to which each of the following statements is true or false for you.

		Definitely true	Mostly true	Not sure	Mostly false	Definitely false
A	I am somewhat ill	1	2	3	4	5
B	I am as healthy as anybody I know	1	2	3	4	5
C	My health is excellent	1	2	3	4	5
D	I have been feeling bad lately	1	2	3	4	5

Section 7: Alcohol Use

The questions in this section are about your drinking of alcoholic beverages.

7.1 Have you ever had a drink containing alcohol?

No	0

Yes	1

IF NO PLEASE GO TO QUESTION 7.26.

7.2 How old were you when you first started drinking alcohol?

	Years

7.3 Do you still take a drink with alcohol sometimes?

• N	• 0
• Y	• 1

Why did you stop drinking alcohol?

• Not applicable/still drinking	• 9

•

•

•

7.5 When did you stop drinking alcohol?

0-6 months ago	1
7-12 months ago	2
13-24 months ago	3
25-36 months ago	4
37 months or more	5
Not applicable	9

IF YOU HAVE NOT HAD AN ALCOHOLIC DRINK IN THE PAST YEAR, PLEASE GO TO QUESTION 7.26.

7.6 How often do you have a drink containing alcohol?

• Monthly or less	• 1
• 2 to 4 times a month	• 2
• 2 to 3 times a week	• 3
• 4 or more times a week	• 4

7.7 On how many days have you drunk alcohol during the past month?

•	•

7.8 What type(s) of alcoholic beverages do you usually drink?

•	•	•	• N
•	• Beer	•	• 0
•	• Cider (e.g. Crossbow, Crown, Hunters, Redds, Savannah, Strongbow)	•	• 0
•	• Bottled wine	•	• 0
•	• Papsak wine	•	• 0
•	• Coolers (e.g. Archers, Bacardi Breezer, Brutal Fruit, Esprit, Hooch, Red Square, Smirnoff Spin, Smirnoff Storm, Smirnoff Triple Spin, Solantis)	•	• 0
•	• Spirits (e.g. gin, whisky, vodka, brandy)	•	• 0
•	• Liqueurs (e.g. Amarula)	•	• 0
•	• Home brew	•	• 0

7.8 Where do you buy your alcohol?

•	•	• Yes	• No	•
•	• I do not buy my alcohol	• 1	• 0	•
•	• Liquor store	• 1	• 0	•
•	• Supermarket/Café	• 1	• 0	•
•	• Spaza shop	• 1	• 0	•
•	• Night club/Disco	• 1	• 0	•
•	• Shebeen	• 1	• 0	•
•	• Restaurant/Pub	• 1	• 0	•
•	• Tavern	• 1	• 0	•
•	• Neighbour	• 1	• 0	•
•	• Other (Please specify)	• 1	• 0	•

7.10 When you are not paying for your alcohol, how do you get it?

•	•	• Y	• N	•
•	• I make it myself	• 1	• 0	•
•	• I get it on credit	• 1	• 0	•
•	• I work for it	• 1	• 0	•
•	• I exchange goods (e.g. clothes) for it	• 1	• 0	•
•	• It is bought for me/given to me	• 1	• 0	•
•	• I take it without paying for it	• 1	• 0	•
•	• Other (Please specify)	• 1	• 0	•

7,13 How many drinks containing alcohol do you have on a typical day when you are drinking? (Please note that one drink is equivalent to one can or bottle of beer, cider or coolers, one glass of wine, or one tot of spirits).

None	0	
1 or 2	1	
3 or 4	2	
5 or 6	3	
7 to 9	4	
10 or more	5	
Other, please specify. If you drink homebrew please indicate the name of the homebrew, type of container, and quantity consumed.	6	

7.12 In which of the following type(s) of venues or events do you usually drink alcohol?

	Y	N
Home	1	0
Park/Outdoors	1	0
Restaurant	1	0
Tavern	1	0
Shebeen	1	0
Bar	1	0
Car park(s)	1	0
Friend's home	1	0
Party	1	0
Festival/Concert	1	0
Other (please specify)	1	0

7.13 With whom do you usually drink alcohol? (Please circle only one)

Alone	1
With friend(s)	2
With relative(s)	3
With partner	4
With whoever is in the drinking place	5
With other (please specify)	6

Below is a list of questions about your drinking behaviour. Please choose the option that best reflects your behaviour

		ever	Less than monthly	onthly	eekly	aily or almost daily
.14	How often do you have six or more drinks on one occasion?	0	1	2	3	4
.15	How often during the last year have you found that you were unable to stop drinking once you had started?	0	1	2	3	4
	How often during the last year have you failed to	0	1	2	3	4

.16	do what was normally expected from you because of drinking?					
• .17	• How often during the last year have you needed a first drink in the morning to get yourself going after a heavy drinking session?	• 0	• 1	• 1	• 1	• 4
• .18	How often during the last year have you had a feeling of guilt or remorse after drinking?	• 0	• 1	• 1	• 1	• 4
• .19	• How often during the last year have you been unable to remember what happened the night before because you had been drinking?	• 0	• 1	• 1	• 1	• 4
• .20	Have you or someone else been injured as a result of your drinking?	• 0	• 1	• 1	• 1	• 4
• .21	Has a relative, friend, or a doctor or other health worker been concerned about your drinking or suggested you cut down?	• 0	• 1	• 1	• 1	• 4

7.22 Have you ever felt you ought to cut down drinking?

• No	• 0
• Yes	• 1

7.23 Have people annoyed you for criticising your drinking?

• No	• 0
• Yes	• 1

7.24 Have you ever felt guilty about your drinking?

• No	• 0
• Yes	• 1

7.25 Have you ever had a drink first thing in the morning?

• No	• 0
• Yes	• 1

7.26 Whom among the following family members has had an alcohol problem?

• •		• Y	• N
•	• Mother	• 1	• 0
•	• Father	• 1	• 0
•	• Uncle	• 1	• 0
•	• Aunt	• 1	• 0
•	• Sister	• 1	• 0
•	• Brother	• 1	• 0

7.27 Are there any warning labels about the health risks of drinking alcohol on any alcohol containers?

• No	• 0
• Yes	• 1
• Do not	• 2

7.28 Does the drinking of alcohol during pregnancy have any effect on the unborn foetus?

• No	• 0
• Yes	• 1
• Sometimes	• 2
• Don't know	• 3

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

[This question is to be coded by the interviewer, according to the instructions received.]

	• Y	• N	
• A Social integration	• 1	• 0	•
• B Physical growth	• 1	• 0	•
• C Intellectual ability	• 1	• 0	•
• D Learning problems	• 1	• 0	•
• E Behavioural problems	• 1	• 0	•
• F Specific facial features	• 1	• 0	•
• G Speech problems	• 1	• 0	•
• H Other (please specify)	• 1	• 0	•

Section 8: Smoking and Other Drug Use

8.1 Have you ever tried or experimented with cigarette smoking, even one or two puffs?

No	0
Yes	1

8.2 How old were you when you smoked a whole cigarette for the first time?

	Years

8.3 Have you ever smoked at least 100 cigarettes (5 packets of cigarettes) or the equivalent amount of tobacco in your lifetime?

No	0
Yes	1

8.4 During the past 30 days, on how many days did you smoke cigarettes?

	Days

8.5 During the past 30 days, on the days you smoked, how many cigarettes did you smoke per day?

I did not smoke during the past 30 days	0
Less than 1 cigarette per day	1
1 cigarette per day	2

2 to 5 cigarettes per day	3
6 to 10 cigarettes per day	4
11 to 20 cigarettes per day	5
More than 20 cigarettes per day	6

8.6 Have you ever used snuff?

No	0
Yes	1

8.7 How old were you when you first used snuff? CIRCLE 99 IF YOU HAVE NEVER USED SNUFF.

	Years
99	

8.8 During the past 30 days, on how many days did you use snuff?

	Days

8.9 Have you ever taken medicines for purposes other than their intended use (e.g. to change the way you feel, think, or behave)?

		Yes	No
A	Over-the-counter medication	1	0
B	Prescription medication	1	0

8.10 Have you ever used any of the following drugs?

		Yes	No
A	Dagga	1	0
B	Mandrax	1	0
C	Heroin	1	0
D	Crack/cocaine	1	0
E	Ecstasy	1	0
F	Methamphetamine (tik)	1	0

8.11 During the past 30 days, on how many days did you use each of the following drugs, if at all?

		0 days	1 or 2 days	3 to 5 days	6 to 9 days	10 to 19 days	20 to 29 days	All 30 days
A	Dagga	0	1	2	3	4	5	6
B	Mandrax	0	1	2	3	4	5	6
C	Heroin	0	1	2	3	4	5	6
D	Crack/cocaine	0	1	2	3	4	5	6
E	Ecstasy	0	1	2	3	4	5	6
F	Methamphetamine (tik)	0	1	2	3	4	5	6
G	Over-the-counter medication (not for its intended use)	0	1	2	3	4	5	6
H	Prescription medication (not for its intended use)	0	1	2	3	4	5	6

Section 9: Sexual Behaviour

This section deals with sexual behaviour. Please note that these questions concern any male partner, including husbands, males with whom you are cohabiting, or other partners.

9.1 When was the last time you had sex, if ever?

Never	0
Within the last week	1
Within the last month	2
More than one month ago	3

IF YOU HAVE NEVER HAD SEX, PLEASE GO TO QUESTION 10.5

9.2 Who did you last have sex with?

Husband	1
Boyfriend	2
Other regular partner	3
Casual acquaintance	4
Someone just met	5
Other (Please specify)	6

9.3 How old were you when you first had sex?

	Years
99	Not applicable

9.4 What is the total number of sexual partners you have had in the past three months?

None	0
1	1
2-3	2
4-5	3
6-7	4
8-9	5
More than 9	6
Not applicable	9

9.5 How often have you had sex under the influence of alcohol in the past three months?

Never	0
1-3 times	1
4-6 times	2
7-9 times	3
10-12 times	4
More than 12 times	5
Not applicable	9

Section 10: Use of Condoms

The questions in this section concern condom use.

10.1 How frequently have you used condoms with your spouse or regular partner(s) in the past 3 months?

Never	0
Seldom	1
Sometimes	2
Always	3
Not applicable (respondent had no spouse or regular partner in the past three months)	9

10.2 How frequently have you used condoms with casual partners in the past 3 months?

Never	0
Seldom	1
Sometimes	2
Always	3
Not applicable (respondent had no casual partner in the past three months)	9

10.3 The last time you had sex, was a condom used?

No	0
Yes	1
Don't know	2
Not applicable	9

10.4 Why did you not use a condom the last time you had sex?

		Yes	No	Not Applicable
A	I did not want to use a condom	1	0	9
B	I did not need to use a condom	1	0	9
C	I did not like condoms	1	0	9
D	I did not know about condoms	1	0	9
E	I did not have a condom	1	0	9
F	Other (Please specify)	1	0	9
G	I used a condom the last time I had sex	1	0	9

10.5 Where can you get condoms from?

		Y	N	
	Government Hospital	1	0	
	Day Hospital/Clinic	1	0	
	Community Health Centre	1	0	
	Family Planning Clinic	1	0	
	Mobile Clinic	1	0	
	Community Health Worker	1	0	
	Private Hospital/Clinic	1	0	
	Pharmacy	1	0	
	Private Doctor	1	0	
	Supermarket	1	0	
	Filling station	1	0	
	Other (Please specify)	1	0	

10.6 How easy is it for you to buy condoms in your community?

Very difficult	0
Quite difficult	1
Quite easy	2
Very easy	3

10.7 How easy is it for you to get free condoms from clinics in your community?

Very difficult	0
Quite difficult	1
Quite easy	2
Very easy	3

10.8 How important is it for you to use condoms when you have sexual intercourse with a casual partner?

Extremely important	0
Quite important	1
Quite unimportant	2
Extremely unimportant	3

10.9 How important is it for you to use condoms when you have sexual intercourse with your regular partner?

Extremely important	0
Quite important	1
Quite unimportant	2
Extremely unimportant	3

Section 11: Use of Contraceptives

11.1 How old were you when you had your first period?

Less than ten years old	1
Ten to fifteen years old	2
Sixteen to twenty years old	3
Beyond twenty years old	4

11.2 Have you ever used anything or tried in any way to delay or avoid getting pregnant?

No	0
Yes	1

11.3 Which is the main method that you are using now to delay or avoid getting pregnant?

Pill	1
IUD	2
Injections	3
Diaphragm/foam/jelly	4
Condom	5
Female sterilisation	6
Male sterilisation	7
Calendar/rhythm	8
Withdrawal	9
Traditional herbs/remedies	10
Abstinence	11
Other (Please specify)	12
None	99

11.4 How long have you used this method?

	Years
	Months
99	Not applicable

11.5 Which are the methods that you have used in the past to delay or avoid getting pregnant?

		Yes	No
A	Pill	1	0
B	IUD	1	0
C	Injections	1	0
D	Diaphragm/foam/jelly	1	0
E	Condom	1	0
F	Female sterilisation	1	0
G	Male sterilisation	1	0
H	Calendar/rhythm	1	0
I	Withdrawal	1	0

J	Traditional herbs/remedies	1	0
K	Abstinence	1	0
L	Other (Please specify)	1	0
M	Unsure	1	0
N	None	1	0

11.6 Where do/did you obtain the method you are using currently?

Government Hospital	1
Government Clinic	2
Community Health Centre	3
Family Planning Clinic	4
Private Hospital	5
Private Clinic	6
Private Doctor	7
Mobile clinic	8
Pharmacy/Chemist	9
Traditional healer	10
Faith healer	11
Don't know	12
Other (Please specify)	13
Not applicable	99

11.7 How old were you when you first used something to avoid getting pregnant?

	Years
99	Not applicable

11.8 From whom did you first get information about methods to avoid pregnancy? (Circle as many as apply)

		Yes	No
A	Mother	1	0
B	Sister	1	0
C	Father	1	0
D	Other Relative	1	0
E	Friend	1	0
F	Teacher	1	0
G	Nurse	1	0
H	Doctor	1	0
I	Social Worker	1	0
J	Poster/Leaflet/Magazine	1	0
K	Radio/Television	1	0
L	Other (Please specify)	1	0

11.9 Did your parent(s) or guardian(s) give you advice on contraceptives or explain how to use them?

No	0
Yes	1

Section 12: Social Support

People sometimes look to others for companionship, assistance, or other types of support. How often is each of the following kinds of support available to you if you need it?

		None of the time	A little of the time	Some of the time	Most of the time	All of the time
12.1	Someone you can count on to listen to you when you need to talk	1	2	3	4	5
12.2	Someone to give you information to help you understand a situation	1	2	3	4	5
12.3	Someone to give you good advice about a crisis	1	2	3	4	5
12.4	Someone to confide in or talk to about yourself or your problems	1	2	3	4	5
12.5	Someone whose advice you really want	1	2	3	4	5
12.6	Someone to share your most private worries and fears with	1	2	3	4	5
12.7	Someone to turn to for suggestions about how to deal with a personal problem	1	2	3	4	5
12.8	Someone who understands your problems	1	2	3	4	5
12.9	Someone who shows you love and affection	1	2	3	4	5
12.10	Someone to love and make you feel wanted	1	2	3	4	5
12.11	Someone who hugs you	1	2	3	4	5
12.12	Someone to have a good time with	1	2	3	4	5
12.13	Someone to get together with for relaxation	1	2	3	4	5
12.14	Someone to do something enjoyable with	1	2	3	4	5

Section 13: Culture

This section has questions concerning your culture. We are interested in knowing what kinds of behaviour would be considered to be in accordance with your culture and the kinds of behaviours that would be unacceptable according to your culture.

13.1 According to your culture men are entitled to have as many children as they wish to have

Strongly agree	1
Moderately agree	2
Moderately disagree	3
Strongly disagree	4

13.2 According to your culture, is it always, usually, sometimes or never wrong to not have children if you do not want to?

Always wrong	1
Usually wrong	2
Sometimes wrong	3
Never wrong	4

13.3 According to your culture, having children is a sign that you are a worthy woman.

Very true	1
Somewhat true	2

Somewhat untrue	3
Very untrue	4

13.4 According to your culture, for a man to have children is a sign that he is a worthy man.

Very true	1
Somewhat true	2
Somewhat untrue	3
Very untrue	4

Section 14: Pregnancy Experiences

Now I would like to ask you about your pregnancies and the health of your last born child.

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

None	0
One	1
Two	2
Three	3
Four	4
Five	5
Six	6
Seven	7
Eight	8
Nine	9
Ten	10
More than ten	11

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

None	0
1 to 2	1
3 to 4	2
5 or more	3

IF NEVER PREGNANT AND NEVER HAD MISCARRIAGES, PLEASE GO TO SECTION 17.

14.3 At the time you became pregnant with your last child, how much did you want to become pregnant then?

A great deal	1
A little	2
Not much	3

Not at all	4

14.4 How much longer would you like to have waited?

	Months
	Years
9	Not applicable

14.5 When you were pregnant, to whom did you go for antenatal care for this pregnancy? (Circle as many as apply)

		Yes	No
A	No one	1	0
B	Doctor	1	0
C	Nurse/midwife	1	0
D	Traditional birth attendant	1	0
E	Other person (Please specify)	1	0
F	Not applicable	1	0

14.6 Where did you go for antenatal care the majority of times during the last pregnancy?

Public hospital	1
Private hospital	2
Public clinic	3
Public surgery	4
Private midwife's office	5
Other (please specify)	6
Not applicable	9

14.7 How many months pregnant were you when you first received antenatal care?

[ ] Months

14.8 How many times did you go for antenatal appointments during this pregnancy?

[ ] Times

14.9 What was the outcome of the pregnancy?

Full-term	1
Pre-term (premature)	2
Still-born	3
Voluntarily terminated pregnancy	4
Miscarriage	5

14.10 Did you have any complications at birth?

No	0
Yes (please specify)	1

14.11 Where did you give birth?

Home	1

Government Hospital	2
Day hospital/clinic/community health centre	3
Private hospital/clinic	4
Other (Please specify)	5

14.12 Who assisted with the delivery? (Please circle as many as apply)

	Yes	No
A. Doctor	1	0
B. Nurse/midwife	1	0
C. Traditional birth attendant	1	0
D. Relative/friend	1	0
E. Other (please specify)	1	0

14.13 Was your child delivered by caesarean section?

No	0
Yes	1
Not applicable	9

14.14 How much did your child weigh at birth?

	Grammes
99	Do not know/do not remember

14.15. How old were you when you gave birth to your last child?

	Years
99	Do not know/do not remember

Section 15: Pregnancy and Alcohol Use

I would like you to now think about this pregnancy or the last time you became pregnant.

15.1 How many months pregnant are you right now?

Not Pregnant	0
1 month	1
2 months	2
3 months	3
4 months	4
5 months	5
6 months	6
7 months	7
8 months	8
9 months	9
Do not know	10

15.2 When last were you pregnant?

In the past year	1
More than one year but less than two years ago	2
More than two years but less than three years ago	3
More than three years but less than four years ago	4
More than four years but less than five years ago	5
More than five years ago	6

15.3 Did you plan to stop smoking because of the pregnancy?

No	0
Yes	1
Not applicable/Not smoking at time of falling pregnant	9

15.4 Did you plan to stop drinking because of the pregnancy?

No	0
Yes	1
Not applicable/Not drinking at time of falling pregnant	9

IF NOT APPLICABLE, PLEASE GO TO QUESTION 16.1

15.5 Whom among the following has advised you to stop drinking during pregnancy? (Please circle as many as apply)

		Yes	No
A	No one	1	0
B	Doctor	1	0
C	Nurse/midwife	1	0
D	Social Worker	1	0
E	Traditional birth attendant	1	0
F	Other person (please specify)	1	0

15.6 Please specify how your drinking changed when you received the advice, and the reason(s) for the change:

I stopped drinking	0	
I reduced my drinking	1	
My drinking did not change	2	
I increased my drinking	3	

15.7 Which of the following factors made it difficult for you to stop drinking during pregnancy?

		Definitely true	Mostly true	Not sure	Mostly false	Definitely false
A	Influences from my friend(s)	0	1	2	3	4

B	Influences from my partner(s)	0	1	2	3	4
C	Influences from family member(s)	0	1	2	3	4
D	Stress	0	1	2	3	4
E	I felt addicted	0	1	2	3	4
F	I enjoyed drinking too much	0	1	2	3	4

15.8 Which of the following factors made it easy for you to stop drinking during pregnancy?

		Definitely true	Mostly true	Not sure	Mostly false	Definitely false
A	My friend(s)	0	1	2	3	4
B	My partner(s)	0	1	2	3	4
C	Family members	0	1	2	3	4
D	Health and/or Social Services	0	1	2	3	4
E	Lack of stress	0	1	2	3	4
F	I did not feel addicted	0	1	2	3	4
G	I did not enjoy drinking anymore	0	1	2	3	4

15.9 During the three months before you became pregnant, how often did you have a drink containing alcohol?

Never	0
Monthly or less	1
2 to 4 times a month	2
2 to 3 times a week	3
4 or more times a week	4

15.10 During the three months before you became pregnant, on what days did you drink alcohol?

Never	0
Occasionally	1
Weekdays only	2
Weekends only	3
Weekdays and weekends	4

15.11 During the three months before you became pregnant, how many drinks containing alcohol did you have on a typical day when you were drinking?

None	0
1 or 2	1
3 or 4	2
5 or 6	3
7 to 9	4
10 or more	5
Other, please specify. If the respondent drank homebrew please ask her to indicate the name of the homebrew, type of container, and quantity consumed.	6

Now I would like you to think about the period during which you were pregnant…

15.12 After you knew you were pregnant, how often did you have a drink containing alcohol?

Never	0
Monthly or less	1
2 to 4 times a month	2
2 to 3 times a week	3
4 or more times a week	4

15.13 After you knew you were pregnant, on what days did you drink alcohol?

Never	0
Occasionally	1
Weekdays only	2
Weekends only	3
Weekdays and weekends	4

15.14 After you knew you were pregnant, how many drinks containing alcohol did you have on a typical day when you were drinking?

None	0	
1 or 2	1	
3 or 4	2	
5 or 6	3	
7 to 9	4	
10 or more	5	
Other, please specify. If the respondent drank homebrew please ask her to indicate the name of the homebrew, type of container, and quantity consumed.	6	

15.15 After you knew you were pregnant, how easy/difficult was it to reduce/stop your drinking?

Very difficult	0
Quite difficult	1
Quite easy	2
Very easy	3
I did not try to reduce my drinking/I never drank before	9

Now I would like to ask you about your next pregnancy, if you were to become pregnant again in the future.

15.16 For you to abstain from alcohol during your next pregnancy would be:

Extremely good	1
Moderately good	2
Neither good nor bad	3
Moderately bad	4
Extremely bad	5

15.17 For you to abstain from alcohol during your next pregnancy would be:

Extremely easy	1
Moderately easy	2
Neither easy nor difficult	3
Moderately difficult	4
Extremely difficult	5

15.18 For you to abstain from alcohol during your next pregnancy would be:

Completely under your control	1
Moderately under your control	2
Neither under your control nor not under your control	3
Moderately not under your control	4
Extremely not under your control	5

15.19 Most people who are important to you think that you should abstain from alcohol during your next pregnancy:

Strongly agree	1
Moderately agree	2
Neither agree nor disagree	3
Moderately disagree	4
Strongly disagree	5

15.20 How likely is it that you will abstain from alcohol during your next pregnancy?

Extremely likely	1
Moderately likely	2
Neither likely nor unlikely	3
Moderately unlikely	4
Extremely unlikely	5

15.21 If your child has any problems, how severe are they?

	Not at all	Mildly	Moderately	Severely	Not applicable
A Social integration	0	1	2	3	9
B Physical growth	0	1	2	3	9
C Intellectual ability	0	1	2	3	9
D Learning	0	1	2	3	9
E Behavioural	0	1	2	3	9
F Specific facial	0	1	2	3	9
G Speech/language	0	1	2	3	9

15.22 Have you ever been told that a child of yours has foetal alcohol syndrome?

No	0
Yes	1
Maybe	2
Not applicable	9

Section 16: Male partners

The questions in this section are about the man who was in your life at the time of your last pregnancy.

16.1 Who was in your life?

No one	0
Father of the child	1
Someone else	2

IF NO ONE WAS IN YOUR LIFE AT THE TIME OF YOUR LAST PREGNANCY, PLEASE GO TO SECTION 18

16.2 How old was he then? _____years

16.3 What was the highest (standard/year) he completed at school?

Less than one year completed	1
Sub A/Class 1/Grade 1	2
Sub A/Class 2/Grade 2	3
Standard 1/Grade 3	4
Standard 2/Grade 4	5
Standard 3/Grade 5	6
Standard 4/Grade 6	7
Standard 5/Grade 7	8
Standard 6/Grade 8	9
Standard 7/Grade 9	10
Standard 8/Grade 10	11
Standard 9/Grade 11	12
Standard 10/Grade 12	13
Further studies – incomplete	14
Diploma/other post school – complete	15
Degree	16
Do not know	17

16.4 Did he work?

No	0
Yes	1

16.5 What was his occupation? That is, what kind of work did he mainly do?

Not working	9
Type of work	

Please indicate how strongly you agree or disagree with the following statements.

	Strongly agree	Moderately agree	Neither agree nor disagree	Moderately disagree	Strongly disagree
16.6 You were satisfied with your relationship with this person	1	2	3	4	5
16.7 Sometimes there were serious disagreements between you and him	1	2	3	4	5
16.8 Sometimes there was hitting or slapping between you and him	1	2	3	4	5
16.9 You had a lot of control in your relationship with him	1	2	3	4	5
16.10 There was a lot of trust between you and him	1	2	3	4	5

Now I would like to ask about his drinking of alcoholic beverages.

		Never	Less than monthly	Monthly	Weekly	Daily or almost daily
16.11	How often did he have a drink containing alcohol?	0	1	2	3	4
16.12	How often did you drink with him?	0	1	2	3	4
16.13	How often did he have six or more drinks on one occasion?	0	1	2	3	4

Now I would like to ask about the effect of his drinking of alcoholic beverages

		No	Yes	Don't know
16.14	Was he or someone else ever injured as a result of his drinking?	0	1	2
16.15	Did a relative, friend, or a doctor or other health worker ever express concern about his drinking or suggest that he cut down?	0	1	2

16.16 How many drinks containing alcohol did he have on a typical day when he was drinking?

None	0
1 or 2	1
3 to 4	2
5 to 6	3
7 to 9	4
10 or more	0

16.17 Did you feel obliged to drink alcohol when your partner was drinking?

Never	0
Sometimes	1
Always	2

Section 17: Your Current Partner

We would now like to ask the same questions about your current partner, whether or not he is the same man we just spoke about.

17.1 Who is your current partner?

No one	0
Father of the child	1
Someone else	2

IF NO ONE, PLEASE MOVE TO SECTION 18.

17.2 Is your current partner the person you just spoke about in Section 16?

No	0
Yes	1

17.3 How old is he now? _____ years

17.4 What was the highest (standard/year) he completed at school?

Less than one year completed	1
Sub A/Class 1/Grade 1	2
Sub A/Class 2/Grade 2	3
Standard 1/Grade 3	4
Standard 2/Grade 4	5
Standard 3/Grade 5	6
Standard 4/Grade 6	7
Standard 5/Grade 7	8
Standard 6/Grade 8	9
Standard 7/Grade 9	10
Standard 8/Grade 10	11
Standard 9/Grade 11	12
Standard 10/Grade 12	13
Further studies – incomplete	14
Diploma/other post school – complete	15
Degree	16

17.5 Does he currently work?

No	0
Yes	1

17.6 What is his occupation? That is, what kind of work does he mainly do?

Not working	9
Type of work	

Please indicate how strongly you agree or disagree with the following statements.

	Strongly agree	Moderately agree	Neither agree nor disagree	Moderately disagree	Strongly disagree
17.7 You are satisfied with your relationship with this person	1	2	3	4	5
17.8 Sometimes there are serious disagreements between you and him	1	2	3	4	5
17.9 Sometimes there is hitting or slapping between you and him	1	2	3	4	5
17.10 You have a lot of control in your relationship with him					
17.11 There is a lot of trust between you and him	1	2	3	4	5

Now I would like to ask about his drinking of alcoholic beverages.

		Never	Less than monthly	Monthly	Weekly	Daily or almost daily
17.12	How often does he have a drink containing alcohol?	0	1	2	3	4
17.13	How often do you drink with him?	0	1	2	3	4
17.14	How often does he have six or more drinks on one occasion?	0	1	2	3	4

Now I would like to ask about the effect of his drinking of alcoholic beverages

		No	Yes	Don't know
17.15	Has he or someone else ever injured as a result of his drinking?	0	1	2
17.17	Did a relative, friend, or a doctor or other health worker ever express concern about his drinking or suggest that he cut down?	0	1	2

17.17 How many drinks containing alcohol does he have on a typical day when he is drinking?

None	0
1 or 2	1
3 or 4	2
5 or 6	3
7 to 9	4
10 or more	5

17.18 Do you feel obliged to drink alcohol when your partner is drinking?

No	0
Yes	1

Section 18: Religious Orientation

These questions inquire about some aspects of your religious life. Please answer each by choosing the option which best represents your normal practice.

18.1 How religious do you consider yourself to be?

Very religious	1
Quite religious	2
Fairly religious	3
Not very religious	4
Not at all religious	5

18.2 How often do you attend religious services?

Frequently	1
Often	2
Sometimes	3
Seldom	4
Never	5

18.3 How often do you pray?

Five times a day	1
More than twice a day	2
Once a day	3
Only when necessary	4
Seldom if ever	5

18.4 How often do you read the Holy Scriptures/Quran…..?

Daily	1
Often	2
Occasionally	3
Seldom	4
Never	5

18.5 How often do you watch or listen to religious programmes on television or radio?

Always	1
Frequently	2
Sometimes	3
Rarely	4
Never	5

18.6 How important is your religious belief in your daily life?

Of utmost importance	1
Of great importance	2
Of some importance	3

Of little importance	4
Of no importance	5

Section 19:Mass Media

Finally, this last section asks about you and the mass media: radio, television, newspapers and magazines.

19.1 Which magazine do you read most often?

19.2 Which local newspaper do you read most often?

19.3 Which national newspaper do you read most often?

19.4 Which radio station do you listen to most often?

19.5 Which television channel do you watch most often?

THANK YOU VERY MUCH

WE REALLY APPRECIATE YOUR HELP

I certify that this interview has been completed in full; with the respondent and according to the instructions I received from the trainers; and that the information I received will be kept strictly confidential.

SIGNED:

_____

(INTERVIEWER'S SIGNATURE)

_____

(DATE)

_____ **(EXACT TIME OF COMPLETION)**

Appendix 3

Letters of Approval from Research Ethics Committee

Health Sciences Faculty
Research Ethics Committee
Room E52-24 Groote Schuur Hospital Old Main Building Observatory 7925 Telephone [021] 4066338 • **Facsimile** [021] 406 6411 **e-mail:** lamees.emjedi@uct.ac.za **04**

04 August 2008

REC REF: 001/2007 and 318/2005

Prof L London
Public Health & Family Medicine

Dear Prof London

PROJECT TITLE: COMPREHENSIVE FETAL ALCOHOL SYNDROME PREVENTION PROGRAMME IN THE WESTERN CAPE AND GUATENG: INDIVIDUAL LEVEL INTERVENTIONS

Thank you for your letter to the Research Ethics Committee dated 27 July 2008.

Thank you for the preliminary analysis of findings from your study. Based on these findings, approval is granted to continue follow-up of participants in the intervention arm until April 2009.

Please note that the ongoing ethical conduct of the study remains the responsibility of the principal investigator.

'Please quote the REC. REF in all your correspondence.

Yours sincerely,

PROFESSOR M BLOCKMAN

CHAIRPERSON. HSF HUMAN ETHICS

UNIVERSITY OF CAPE TOWN

Faculty of Health Sciences
Human Research Ethics Committee
Room E52-24 Groote Schuur Hospital Old Main Building
Observatory 7925
Telephone [021] 406 6626 • **Facsimile** [021] 406 6411
e-mail: lamees.emjedi@uct.ac.za

15 December 2011

HREC REF: 575/2011

Ms T Lowrey
Public Health & Family Medicine
Falmouth Building
Medical School

Dear Ms Lowrey

PROJECT TITLE: PSYCHOSOCIAL FACTORS ASSOCIATED WITH FEMALE PROBLEMATIC AND BINGE DRINKING IN A SOUTH AFRICAN RURAL AND URBAN SETTING

Thank you for submitting your study to the Faculty of Health Sciences Human Research Ethics Committee

It is a pleasure to inform you that the HREC has **formally approved** the above-mentioned study.

Approval is granted until **28 December 2012.**

Please send us an annual progress report (website form FHS 016) if your research continues beyond the approval period. Alternatively, please send us a brief summary of your findings so that we can close the research file.

Please note that the ongoing ethical conduct of the study remains the responsibility of the principal investigator.

Please quote the REC. REF in all your correspondence.

Yours sincerely

Lidey Lowrey

PROFESSOR M BLOCKMAN
pp **CHAIRPERSON, HSF HUMAN ETHICS**

Federal Wide Assurance Number: FWA00001637.
Institutional Review Board (IRB) number: IRB00001938

lemjedi

Appendix 4

Alternative models for modeling psychosocial variables and possible confounders

Urban

- Model 1: *Outcome variable*: problematic drinking; *predictor variable*: family member with an alcohol problem; *confounders*: employment status, socioeconomic status and "couloured": *significance level*: p<0.05
- Model 2: *Outcome variable*: binge drinking; *predictor variable*: family member with an alcohol problem; *confounders*: onset of alcohol consumption before the age of 18 and employed: *significance level*: p<0.05

Rural

- Model 3: *Outcome variable*: problematic drinking; *predictor variable*: self-esteem and binge drinking partner; *confounders*: education level: *significance level*: p<0.05
- Model 4: *Outcome variable*: binge drinking; *predictor variable*: self-esteem and binge drinking partner; *confounders*: education level: *significance level*: p<0.05
- Model 5**Forward Stepwise model** *Outcome variable:* binge drinking*: predictor variable:* binge drinking partner; *confounders*: education; *significance level*: p<0.10

Table 2: Logistic regression models for problematic & binge drinking in urban site & rural sites

	URBAN		RURAL		
	Problem	Binge	Problem	Binge	Binge
	Model 1 AOR (95% CI)	Model 2 AOR (95% CI)	Model 3 AOR (95% CI)	Model 4 AOR (95% CI)	Model 5 AOR (95% CI)
Self-Esteem					
High	--	--	1.0	--	--
Low/Mod			**3.0**** **(1.3-7.0)**		
Mental Health					
Good	--	--	**--**	--	--
Poor					
Social Support					
Strong	--	--	--	--	--
Weak					
Social Capital					
Strong	--	--	--	--	--
Weak					
Binge drinking partner					
No			1.0	--	1.0
Yes	--	--	**3.1**** **(1.5-6.6)**		2.5* (0.93-5.5)
Alcohol problem in 1+ family member					
No					
Yes	1.0 **3.9**** **(1.6-9.5)**	1.0 **3.6**** **(1.4-9.3)**	--	--	--

p<0.05;** *p<0.10 CI: confidence interval; OR: odds ratio; AOR: adjusted odds ratio

Appendix 5

Instructions for Author for Journal Social Science % Medicine

http://www.elsevier.com/wps/find/journaldescription.cws_home/315/authorinstructions

Social Science & Medicine
Guide for Authors

Introduction

Social Science & Medicine provides an international and interdisciplinary forum for the dissemination of social science research on health. We publish original research articles (both empirical and theoretical), reviews, position papers and commentaries on health issues, to inform current research, policy and practice in all areas of common interest to social scientists, health practitioners, and policy makers. The journal publishes material relevant to any aspect of health and healthcare from a wide range of social science disciplines (anthropology, economics, epidemiology, geography, policy, psychology, and sociology), and material relevant to the social sciences from any of the professions concerned with physical and mental health, health care, clinical practice, and health policy and the organization of healthcare. We encourage material which is of general interest to an international readership.

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