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ALCOHOL USE AND MENTAL HEALTH IN GHANA

BY

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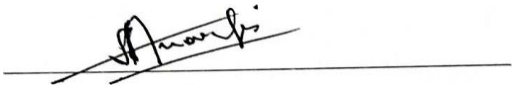

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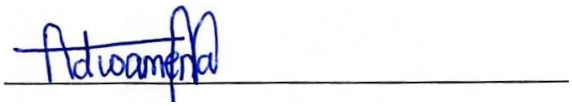
DECLARATION

I hereby declare that, except for references to other people's work, which have been duly acknowledged, this is the result of my own research and it has neither in part nor in whole been presented for another degree.



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13th May 2021

Date

DEDICATION

This work is dedicated to the memory of my late father and the tireless and unflinching support of my dedicated mother and brothers.

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LIST OF ABBREVIATIONS

Abbreviation	Meaning
APA	American Psychiatric Association
AUD	Alcohol Use Disorder
BMI	Body Mass Index
CHPS	Community-Based Health Planning and Services
CMD	Common Mental Disorders
CMHO	Community Mental Health Officers
CPN	Community Psychiatric Nurses
CVDs	Cardiovascular Diseases
DALYs	Disability-Adjusted Life Years
DSM	Diagnostic and Statistical Manual of Mental Disorders
FDA	Food and Drugs Authority
FGD	Focus Group Discussion
GBD	Global Burden of Disease
GHS	Ghana Health Service
HICs	High-Income Countries
ICD-10	10^{th} Revision of the International Statistical Classification of Diseases
LMICs	Low- and Middle-Income Countries
MDE	Major Depressive Episode
MHA	Mental Health Authority
mhGAP	Mental Health Gap Action Programme
MiDE	Minor Depressive Episode
MOH	Ministry of Health
NBREG	Negative Binomial Regression Model
NCDs	Non-Communicable Disease
OLS	Ordinary Least Squares
OPD	Out-Patients Department
SDG	Sustainable Development Goals
SSA	sub-Saharan Africa
WHO	World Health Organization
YLDs	Years Lived with Disability
ZINB	Zero-Inflated Negative Binomial Poisson Model
ZIP	Zero-Inflated Poisson Regression Model

ABSTRACT

Introduction: Previous research has documented an increase in alcohol and mental ill health-related morbidity and mortality globally. They also suggest a positive association between alcohol use and mental disorders in high and limited income countries, which has implications for future morbidity and mortality trends particularly in limited income countries. Despite these, panel and mixed methods studies, which would help to provide a holistic account of alcohol use and mental health and produce stronger evidence to inform interventions are lacking. This thesis therefore sought to examine the association between alcohol use and mental health among adults in Ghana.

Methodology: Qualitative and quantitative data were combined. The quantitative data were used to examine associations between alcohol use and depression in a subsample of individuals interviewed in Wave 1 and followed up in Wave 2 of the nationally representative World Health Organization's Study on Global Ageing and Adult Health (SAGE) Ghana survey. Among the 1499 participants of which 51% were males with mean age of 48.2±13.0 years in Wave 1, 12-month self-reported depression was assessed using DSM-IV diagnostic criteria yielding a composite outcome variable of counts of depressive symptoms. The categorical alcohol use measure comprised of lifetime abstinence, former use (alcohol not consumed 12 months prior to survey), moderate use (≤14 standard drinks for men, ≤7 standard drinks for women) and hazardous use (≥15 standard drinks for men and ≥8 standard drinks for women). Daily counts of standard drinks of alcohol was the second measure of alcohol use. Data were analysed separately for men and women using cross-sectional, panel descriptive statistics, and Poisson multivariate panel regression models with random effects and robust variance specifications. The qualitative data were used to explore community level understandings of alcohol consumption and mental health. The data comprised of transcripts from 30 focus group discussions (FGDs) on alcohol use and mental health from five communities in five regions in Ghana. Transcripts were analysed using thematic network analysis. The ages of FGD participants ranged from 20 to 80 years.

Results: Descriptive statistics showed a 39.5% increase in number of depressive symptoms in the total sample with women reporting more symptoms compared to men over time. Although there was a decline in alcohol consumption among men and women over time, alcohol initiation, use (moderate or heavy use) and discontinuation (former use) was higher among the men than women. Cross-sectional multivariate results showed male former,

moderate and heavy drinkers and female heavy drinkers having higher counts of depressive symptoms in Wave 1.

Panel analysis, which aimed to test bidirectional associations, showed a unidirectional positive relationship between alcohol use and depression after adjusting for both time-variant and invariant confounding variables.

Focus Group Discussions (FGD) of participants' understandings of causes of mental health problems and alcohol consumption bordered on notions of both normal (biological) and abnormal (spiritual) causation. Participants indicated a bidirectional relationship between alcohol use and mental health. Their accounts of subpopulations such as females, persons living with chronic conditions and individuals undergoing stressful life events being predisposed to depression corroborated cross-sectional and longitudinal quantitative findings on depression. Local terms were used to define and describe mental illness and consequences of mental ill health as well as coping strategies adopted in the various communities were indicated.

Participants described the socio-cultural context of alcohol use in their communities revealing that alcohol in contemporary times still formed part of social and religious activities in their communities. Further, they explained the causes and outcomes of alcohol consumption.

Conclusions: Quantitative results showed an increased prevalence of depression particularly among females, heavy alcohol use among males, as well as both short term and long-term associations between alcohol use and depression therefore requiring increased gender-specific interventions on alcohol use and depression. In addition, qualitative results depicted community members holding dual notions of mental illness causation different from biomedicine, which in turn influenced their coping strategies and health-seeking behaviour. These findings necessitate increased policy interventions on the adoption of healthy lifestyles, enactment and enforcement of regulations on alcohol distribution, sale and use and collaborations between orthodox and traditional medicine to meet the needs of persons with poor mental health.

CHAPTER ONE

INTRODUCTION

1.1 Background

In 2001, the World Health Report highlighted the importance of, the need to understand and promote mental health through coordinated efforts at various sectors of society (World Health Organization [WHO], 2001). Since then, developmental efforts to improve on, and promote mental health by international organisations and governments have been made. However, almost two decades after, the burden of mental ill health has increased. For instance, a global assessment of disability and mortality from major diseases and injuries reports that the contribution of mental and substance use disorders to the global burden of diseases increased from 7.8 per cent in 2010 to 11 per cent in 2013 (Votruba et al., 2016). Global estimates of prevalence of common mental disorders (CMDs) such as depression and anxiety was 4.4 per cent and 3.6 per cent respectively in 2015 (WHO, 2017). In addition, depressive disorders have persisted as the fourth leading cause of Years Lived with Disability (YLDs) for nearly three decades (Collaborators, 2018). Between 1990 and 2017, the number of incident depression cases globally increased from 172 million to 258 million indicating a 50% increase (Liu et al., 2019). Furthermore, it has been projected that more than half of the general population in high income countries (HICs) and low- and middle-income countries (LMICs) will live with at least one mental disorder at a point in their life hence making it a major public health issue with far-reaching consequences on the population (Trautmann et al., 2016).

In 2015, more than 80 per cent of the global burden of depression occurred in low- and middle-income countries (LMICs). In sub-Saharan Africa (SSA), mental disorders were the fourth leading contributor to the non-communicable disease (NCD) burden in 2017 (Gouda et al., 2019). Research showed that mental disorders are increasingly prevalent in

SSA due to demographic changes such as aging, civil conflicts (Charlson et al., 2019), disaster, globalisation, rapid urbanisation and migration precipitating lifestyle changes, and stressful situations such as poverty, malnutrition, HIV/AIDS, and malaria (Baingana, Alem, & Jenkins, 2006; Akyeampong, Hill, & Kleinman, 2015). Half of the countries in Africa had a policy on mental health by 2005 (Gureje, 2009), however, there prevails a neglect of mental disorders (de-Graft Aikins & Koram, 2017; Mental Health Authority [MHA], 2018). For instance, in 70% of African countries, mental health forms one per cent of the health budget (Jacob et al., 2007). There is also a high unmet need for mental health service with a high percentage of untreated mental disorders (Patel, 2007b; Rathod et al., 2017).

Alcohol consumption as a public health issue has also contributed significantly to morbidity and mortality across space and time. About 5.1 per cent of the global burden of disease is as a result of alcohol consumption which accounts for more annual deaths than HIV/AID or tuberculosis (Martinez, 2012; WHO, 2014; Ministry of Health [MOH], 2016; WHO, 2018). Alcohol is widely used as more than half of the world's population have ever consumed alcohol (Witkiewitz & Stauffer, 2014). Globally, individuals 15 years and older consume on average 6.2 litres of pure alcohol per year with the highest consumption of alcohol being reported in HICs (WHO, 2014). In 2010, recorded and unrecorded consumption[1] of alcohol per capita among both males and females 15 years and above ranged between 0.1 and 11 litres in Africa and 4.8 litres in Ghana (WHO, 2014). Also, 23 per cent of Ghanaians take alcohol (MOH, 2016). Although alcohol consumption is relatively lower in LMICs compared to HICs, there is a pattern of hazardous drinking such as intermittent intake of large quantities of spirits among consumers in these settings which has dire health implications on the individuals and the population at large (Patel, 2007;

[1] Recorded alcohol consumption refers to the intake of alcohol that has been registered to be sold and used in a country. Unrecorded alcohol consumption refers to intake of unregistered alcohol sold and produced via informal channels, outside the control of government (WHO, 2018).

Marquez & Farrington, 2013; Mallick & Assaf, 2015; Connor & Hall, 2015). Furthermore, 85 per cent of the world's population live in LMICs (Jacob et al., 2007) and with existing weak health systems, poverty, and conflicts more especially in SSA, there is a disparate impact of the burden of disease and mortality attributable to alcohol use which makes attaining development goals on health difficult (Cornah, 2006a).

The social structure, social relations, national policies, levels of stress and cultural change determine patterns and intensity of use of alcohol in different societies (Acheampong, 1996). Production and consumption of alcohol in Ghana predates colonisation. It has value in the Ghanaian society as it is of ritual and social significance, an economic good, and a social marker (Acheampong, 1996). Ritually, it was used in warfare, chieftaincy, state formation, and to date it has been used during naming ceremonies, puberty, marriage rites, funerals, festivals among other public gatherings. Socially, it is a means of fostering cohesion hence used during various rites of passage and festivities. In addition, alcohol performs an economic function because it enhances the economic circumstances of those who produce and market these products. It is also a social marker because the type of alcohol consumed portrays the socioeconomic status of an individual (Acheampong, 1996).

In addition to the value placed on alcohol, Ghana's demographic context makes alcohol abuse inevitable. The population is characterised by a high proportion of youth (GSS, 2013). The youthful period is marked with social and psychological development hence a high tendency to abuse alcohol and other psychoactive substances (Hammond et al., 2014). Also, incessant advertising of alcohol in the Ghanaian mass media, unregulated sponsorship of sports, music and other social events, selling and buying of alcohol by minors (de Bruijn, 2011) and an increase in illegally produced alcohol (homemade, or sold outside normal government controls) (WHO, 2014) present a high risk of alcohol abuse and serious health consequences. With no measures put in place, young persons would be unable to live

productive lives (both socially and economically) hence inability of the country to achieve health goals to harness the demographic dividend.

Alcohol is causally linked to eight broad disease and injury categories namely cancers, cardiovascular diseases (CVDs) and diabetes, neuropsychiatric disorders, gastrointestinal diseases, infectious diseases, unintentional and intentional injuries and neonatal conditions (WHO, 2014; Rehm et al., 2017). Out of these broad categories, alcohol contributed more, that is, 25% to the disease burden from neuropsychiatric disorders in 2010 (WHO, 2014). In a more recent report, alcohol contributed about 49% to the disease burden of NCDs and mental health conditions (WHO, 2018). Alcohol consumption could also lead to mental health conditions such as alcohol use disorders (AUDs) and suicide ideation. Theoretical explanations of the effect of alcohol use on mental health and vice versa have been proffered. On the one hand, the probable biological processes by which harmful consumption of alcohol leads to mental disorders is that it affects the brain structure by reducing the grey and white matter in the brain and the brain functioning by limiting cognitive ability (Buhler & Mann, 2011; Bell & Britton, 2014; Squeglia, Jacobus, & Tapert, 2014; Welch, 2017; Topiwala et al., 2017). It also affects metabolism and reduces folate levels, which has been associated with increased risk of depression. In addition, harmful consumption of alcohol has an influence on social relations (Cornah, 2006; Babor et al., 2010), economic and legal circumstances creating relational strains, forming stressful life situations and leading to poor mental health (Kendler et al., 2003; Babor et al., 2010; Rehm et al., 2017). On the other hand, poor mental health leads to alcohol consumption when individuals take in alcohol to cope with depression by countering negative feelings (Balogun et al., 2014; Rehm et al., 2017; Collins et al., 2018). Subsequent incessant use of alcohol further leads to severe depression as serotonin levels in the nervous system become depleted and the individual would need to consume more alcohol to medicate the severe depression (Cornah, 2006a).

Among causes of Out-Patients Department (OPD) attendance across selected psychiatric hospitals in Ghana, about seven per cent were as a result of mental disorders due to psychoactive substance use (MHA, 2018). Like other African countries, there exists a double burden of communicable and non-communicable diseases in Ghana with demographic and socio-economic changes which have transformed patterns of morbidity and mortality in recent decades (Agyei-Mensah & de-Graft Aikins, 2010; de-Graft Aikins & Koram, 2017). Acknowledging this, health policies in Ghana, including the National Health Policy (2007), Ghana Non-Communicable Disease Policy (2011), the National Alcohol Policy (2016) and the Mental Health Policy (1994 revised in 2000) have all aimed at improving physical and mental public health hence address development goals. However, mental health services have been substantially underfunded. As health is not complete without mental health, a study of the relationship, and direction of the link between alcohol use and mental health is vital to understanding how lifestyle risk factors, specifically alcohol use influence mental health in Ghana. It would inform policy interventions, which would prevent mental ill health, promote optimal health and achieve national health goals as well as the Sustainable Development Goal (SDG) 3.3.

1.2 Statement of the Problem

A review of literature shows an increasing prevalence and association between lifestyle factors and mental health outcomes in HICs and LMICs (Patel et al., 2018). Particularly, the evidence base for the association between alcohol use and mental health in HICs is strong (Pacek et al., 2013; Bell et al., 2015; Churchill & Farrell, 2017; Danzo et al., 2017; Subramaniam et al., 2017; Collins et al., 2018; Kenney et al., 2018; Otten et al., 2018; Schwarzinger et al., 2018). These studies have predominantly considered Whites, African Americans, Hispanics, and Asian people of which the results may only be generalizable to their context. The evidence base is weak in LMICs, specifically SSA (Patel, 2007; Glantz et al., 2014) and scarce in Ghana. It is uncertain whether previous findings in Western

contexts could be applied to the cultural context of SSA because there are differences in religious and cultural beliefs and practices, in alcohol tolerance, strength of health systems, stages of the epidemiologic and demographic transition, availability and ease of assessing legally or illegally produced alcohol, variations in the levels at which laws on alcohol consumption are enforced and legal drinking age (Balogun et al., 2014). These factors may either increase risk of hazardous alcohol use or be protective therefore determine differences in prevalence of mental disorders.

Again, LMICs bear a disproportionate burden of disability associated with mental disorders coupled with mental health systems bedevilled with deficiencies (Jacob et al., 2007) and Ghana is of no exception (Ghana Health Services [GHS], 2015). For instance in 2011, out of an estimated 2.4 million persons with mental health problems only 2.8 per cent received treatment. There were only 3 psychiatric hospitals, 123 mental out-patient facilities mainly concentrated in the regional capitals, a shortfall in mental health workers with 69 out of the 138 districts having less than 2 community psychiatric nurses, and in the same year, GHS spending was 1.4% of the total budget on health (Roberts et al., 2014). Furthermore, accessibility and quality of psychotropic medicines are inadequate (Oppong et al., 2016). This makes it difficult to cater for the mental health needs of the Ghanaian population. In addition, mental health studies in Ghana have only considered the prevalence of mental disorders (Tagoe & Dake, 2011; Adusi-Poku, Bonney, & Antwi, 2013; Tampah-Naah & Amoah, 2015; Osei-bonsu et al., 2017), factors influencing alcohol use (Nketiah-Amponsah et al., 2018), and the effect of drug use on mental health (Affinnih, 1999) but not the contribution of alcohol use to mental health. This observation is affirmed by Read & Doku (2012) who discuss in their review of literature from 1955 to 2009 on mental health research in Ghana that substantial work is required on the mental health implications of psychoactive drugs such as alcohol.

Moderate alcohol use has been indicated to be linked to lower risk of type 2 diabetes (Knott et al., 2015; Li et al., 2016) and coronary heart diseases (Ronksley et al., 2011). Contrastingly, Jackson et al. (2015) in their study conclude that the protective health benefit of moderate alcohol use reported among persons of European descent appears not to exist among blacks. Further, a global study utilizing data on 28 million people found no protective effect of moderate alcohol consumption on CVDs (Griswold et al., 2018). The link between moderate alcohol use and depression has been explored in mainly studies in Western contexts with predominantly white study populations (Bellos et al., 2013). Genetic, environmental, economic and socio-cultural factors might account for differential findings in other contexts. It is unknown whether moderate alcohol use compared to abstinence is longitudinally linked to lower risk of poor mental health among Ghanaians.

Studies on mental health, including depression have used either quantitative or qualitative approach of research to understand mental health problems. Purely quantitative studies based on diagnostic criteria tend to exclude persons who may not fit into the biomedical diagnostic criteria but fit into sociocultural criteria of poor mental health and purely qualitative studies cannot provide population level estimates. As well, quantitative studies fail to explore how illnesses are constructed and experienced in varied socio-cultural contexts.

Some studies on mental health have often used ordinary least squares (OLS) and logistic regression models to assess count dependent variables. Count dependent variables are mostly not normally distributed as they have a high proportion of zeros and are over dispersed. Using parametric models like the OLS for non-normally distributed data could bias the results or ignore significant variations in the data hence count models are required for variables with non-normal distributions (Karazsia & Van Dulmen, 2008; Zaninotto & Falaschetti, 2011; Xu et al., 2017).

1.3 Research Questions

Based on the problems identified, this study seeks to answer the following research questions

i What are the levels and changes in alcohol use and mental health over time?

ii What is the cross-sectional relationship between alcohol use and mental health among men and women in Waves 1 and 2?

iii What is the longitudinal relationship between alcohol use and mental health among men and women?

iv What is the direction of the relationship between alcohol use and mental health in Ghana over time?

v What are the community level views on alcohol use and mental health in Ghana?

1.4 Objectives of the Study

The overarching objective of this research study is to examine the relationship between alcohol use and mental health in Ghana.

1.4.1 Specific Objectives

Specifically, the study aims to:

1. Examine the levels and changes in alcohol use and mental health over time.
2. Assess the cross-sectional relationship between alcohol use and mental health among men and women in Waves 1 and 2.
3. Investigate the longitudinal relationship between alcohol use and mental health among men and women.
4. Find out the direction of the relationship between alcohol use and mental health in Ghana over time.
5. Explore the community level views on alcohol use and mental health in Ghana.

1.5 Rationale of the Study

Mental health is linked to social and economic development (Skeen et al., 2010; Votruba et al., 2016) as it contributes to poverty and productivity in a population. Given this relationship, mental health has gained increased recognition at the global level subsequently, its specification in the SDGs. Particularly, mental health is fundamental to achieving the other SDGs, for instance goals 1, 8 and 11 which aim to end poverty, achieve economic growth and make cities and human settlements inclusive (Votruba et al., 2016). Global mental health progress is hinged on improvement in country level mental health hence the need for addressing it at the country level. Over the past few decades, Ghana has made significant strides by having a mental health act in place, which positions the country to achieve the development goals on health. However, implementation of mental health goals is limited, as Ghana does not have a mental health policy document in place. Also, the WHO Mental Health Action Plan recommends strengthening evidence and research for mental health (WHO, 2013, 2018b). Following this, as a longitudinal study, this research is timely, as it would provide information on changes in alcohol trends and its effect on mental health among adults in Ghana to strengthen research on mental health and provide evidence to inform the mental health policy and public health service interventions.

Persons living with mental disorders experience disproportionately higher rates of morbidity, disability and mortality (WHO, 2013; Liu et al., 2017). This is mainly due to the fact that NCDs such as cancers, CVDs, diabetes, and chronic respiratory diseases often co-occur with mental disorders and this influences the course of the co-morbid condition (Institue of Medicine, 2010). Persons with poor mental health are also likely to abuse alcohol in order to cope with their ailment, which might worsen their condition. Additionally, unequal access to health-care services by persons with mental disorders exacerbates their situation. Based on this, health would not be complete without mental wellbeing as mental health cuts through all major health concerns, for instance, physical and social well-being

(Prince et al., 2007). Hence this study is important as it would provide evidence to inform psychosocial interventions which could be utilised in managing mental illness in order to reduce level of disability and mortality associated with poor mental health in Ghana.

The paucity of research on alcohol consumption and mental health in limited resource contexts makes this study relevant. It would fill the knowledge gap by providing information on the trends in alcohol consumption and mental health. In addition, it would extend previous longitudinal bidirectional studies by examining the relationship between alcohol consumption and mental health over time among adults in a sub-Saharan Africa context, specifically Ghana. Hence, it will contribute to a better understanding of the relationship in the unique cultural and social context of a non-Western country more so with a more recent and nationally representative population-based data.

Knowledge of the direction of the relationship between alcohol use and mental health in Ghana would contribute to policy specificity and to practice. Policy specificity is relevant in the Ghanaian context as Ghana's mental health system is characterised by limited workforce, facilities, treatment gap (Norris et al., 2016) and low expenditure on mental health (Roberts et al., 2013; Roberts et al., 2014). When policy is specific in a context of scarce resources, efficient use of these resources would be optimised. With regard to informing practice, findings would help determine whether to integrate alcohol addiction treatment in general mental health services in order to improve treatment outcomes for persons with poor mental health.

The World Health Report in 2001 recommended that public health action should focus on the whole drinking population rather than on only alcohol-dependent persons (WHO, 2001). This could be attributable to the fact that small amounts of alcohol consumed could have adverse effects on the health of the individual (Topiwala et al., 2017; WCRF/AICR, 2018). This study would contribute to knowledge by examining the various alcohol use

statuses that is abstention, former use, moderate use and heavy use and how they evolve over time. In essence, patterns of alcohol use among Ghanaians in a bid to identify the drinking population by grouping alcohol users into subcategories to find out the threshold at which alcohol use is harmful to mental health would provide detailed information to programmes targeting the drinking population as a whole.

A holistic approach by integrating quantitative and qualitative methods at the analysis and inferential stages to study the relationship between alcohol use and mental health would contribute to knowledge and a deeper understanding of the phenomena. Specifically, the prevalence, trends and associations between alcohol use and mental health at the population level would be provided by the quantitative data, and the community level understandings of alcohol use and mental health would be contributed by the qualitative data.

The relevance of this study is to overcome limitations of using other estimation models to analyse discrete (count) variables that require normally distributed data. Treating non-normally distributed data as count and not leaving the variable as a categorical variable would first serve to prevent the loss of information by estimating the average depression symptom count over time and extent of variation. Further, using non-parametric models to estimate non-normally distributed discrete outcome variables would provide robust and reliable estimates.

1.6 Conceptual Definition of Terms

1.6.1 Mental Health

Mental health is considered as a state of complete social, psychological and emotional wellbeing with an absence of mental disorders (WHO, 2001; Keyes, 2005; MHA, 2018). This suggests that, when mental health is present in an individual, mental illness is absent. In other words, an individual without mental illness is expected to live a healthier and

productive life. However, this is not always the situation as such individual, though not having a mental disorder is not mentally healthy because he or she may not have a complete state of psychological or emotional wellbeing.

Various studies have distinguished mental health from mental disorders or considered them as distinct concepts. Keyes' (2005) study demonstrates that, mental health and illness are correlated and their variations overlap. Due to this, some studies have used mental illness measures for studies on mental health. Similarly, this study would consider depressive symptoms, a mental illness measure as a proxy for mental health hence the concepts are used interchangeably to a considerable degree. Depression is used as a proxy for mental health because depression is a common mental disorder, which accounts for poor mental health in many populations (WHO, 2017). Again, depression is used interchangeably with mental health because there is some level of statistical dependence between mental health and illness as depicted by Keyes (2005) and Slade (2010). In essence, persons with zero or one depressive symptom may still have an incomplete mental health state. In view of this, in the various chapters of this thesis, the concepts of mental health, mental illness, mental disorders, poor mental health, and depression would be used interchangeably. These terms are defined in the subsequent sub-sections.

1.6.2 Mental Illness

Mental illness or mental ill health is an umbrella term that refers to all diagnosable mental disorders (Goldman & Grob, 2006)

1.6.3 Mental Disorders

Mental disorders are clinically significant behavioural or psychological syndrome or patterns that occurs in an individual and that is associated with present distress (e.g., a painful symptom) or disability (i.e., impairment in one or more important areas of functioning) or with a significantly increased risk of suffering death, pain, disability, or an

important loss of freedom (American Psychiatric Association [APA], 2000). Mental disorders are identified by persistent trends in disturbed speech, perceptions, mood, thought, preference, and orientation (MHA, 2018).

1.6.4 Major Depressive Episode (Depression)

Major Depressive Episode or Depression is a mental disorder characterised by sadness for at least two weeks and loss of interest or pleasure, feelings of guilt or low self-worth, disturbed sleep or appetite, feelings of tiredness, and poor concentration (WHO, 2017).

1.6.5 Poor Mental Health

Poor mental health consists of the state of being mentally ill or living with mental disorders.

1.6.6 Alcohol Use/Consumption

The consumption of a beverage(s) containing more than 0.5% alcohol (WHO, 2018).

1.6.7 Excessive Alcohol Use

The use of alcohol beyond a country or society's prescribed or recommended maximum.

1.6.8 Alcohol Misuse

This comprises of the abuse of alcohol. Alcohol abuse is the excessive use of alcohol, which impairs the user's social, physical, mental and emotional functioning. Situations of alcohol abuse include hazardous and harmful alcohol use, binge drinking, alcohol addiction and dependence. Hazardous drinking is drinking excessively which puts the user at risk of poor physical and mental health. Harmful use is consuming alcohol to the point of poor health. Binge drinking is the harmful consumption of excessive alcohol where an individual(s) takes many alcoholic beverages (5 and 4 standard drinks for men and women respectively) in about 2 hours. Alcohol addiction is an AUD with which the user is unable

to stop consuming alcohol despite its negative impact on the social, physical and psychological well-being of the individual. Alcohol dependence is a more serious AUD where the heavy drinker requires an amount of alcohol to be able to function well (MOH, 2016; Centres for Disease Control and Prevention [CDC], 2019).

1.7 Organization of Study

The study consists of eight chapters, which is structured as follows: the first chapter introduces the study by giving a background to the study, stating the research problem, the study objectives, rationale and research questions. Chapter two entails a review of pertinent literature on alcohol use and mental health. The study area and research methods used are described in Chapter three. Chapter four presents results on the first objective and it describes the characteristics of the respondents as well as examines trends in alcohol consumption and mental health between 2007 and 2014. Results on the second and third objectives, which aims to examine the cross-sectional associations between alcohol use and mental health are presented and discussed in Chapter five. In Chapter six, findings on the longitudinal relationship between alcohol use and mental health in Ghana are shown and discussed while Chapter seven also shows and discusses results on the qualitative study on community perceptions of alcohol use and mental health. Chapter eight presents the summary, conclusions, limitations and recommendations of the study.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

There have been advances in research on mental health over the past few decades. This chapter aims at providing an overview of alcohol use and mental health by examining, summarizing and synthesizing existing knowledge from quantitative, qualitative and mixed methods studies on mental health and alcohol use. Review of literature is relevant in providing context and understanding of the nature of the research problem being investigated as both historical and current studies from various contexts are examined. The subsequent sections in this chapter first present studies on mental health in both developed and developing contexts. This is followed by the review of studies on alcohol use in historic and contemporary times in various settings. Thirdly, literature examining the association between alcohol use and mental health are reviewed together with theories explaining the relationship. Lastly, the conceptual framework guiding this study, which is adapted from various theories on alcohol use and mental health, is explained.

2.2 Mental Health: A Global Overview

Mental health is a crucial public health and development issue as it is central to development efforts and the achievement of development goals (Prince et al., 2007; Mills, 2018). Mental health has been regarded as fundamental to health as the constitution of WHO defines health as *"... a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity*" (WHO, 2013, p.7; Bhugra, Till, & Sartorius, 2013). By this, an individual who is physically healthy without mental wellbeing is not considered healthy (Prince et al., 2007).

Understandings of mental health and mental functioning have advanced over the past few decades as information from research in the fields of psychology, psychiatry, neuroscience, behavioural medicine and public health has increased (Wainberg et al., 2017). These advances have highlighted changes in mental health perspectives, practice (treatment), prevention and global development policies (Wainberg et al., 2017). Pertaining to mental health perspectives there has been a shift from biological model to the biopsychosocial model of explaining mental illness. With the biomedical model, mental illness is explained as being caused by biological processes or factors (e.g. genetics) (Papadimitriou, 2017). The biopsychosocial model, which is more holistic, considers mental illness as being caused by the interplay of biological, psychological and social factors (Papadimitriou, 2017). In relation to prevention, there has been a shift from treating mental illness to improving mental well-being (Slade, 2010) and also, an increased focus on precipitating factors rather than predisposing factors of mental health (Bloom, 1979). With respect to practice, there has been an integration of mental health services into primary health care (Wakida et al., 2018) and a transformation from hospital to community-based mental health care service (Shen & Snowden, 2014).

With respect to transformations in mental health policies, Global development policies on mental health took a new turn with the publication of the Global Burden of Disease, World Mental Health reports which highlighted the need for global attention on mental disorders as it was central to addressing other public health issues (Patel, 2007b). These in turn contributed to publication of the landmark WHO annual report in 2001 themed "New Understandings, New Hope" which was dedicated to mental health. This report sought to raise awareness on the global burden of mental disorders and made policy recommendations which HICs and LMICs could adapt (WHO, 2001). Despite previous publications and the dedication of WHO's 2001 annual report and World Health Day 2001 theme to mental health marking an increased attention towards mental health, the MDGs

did not include goals on mental health. Subsequent projects, interventions, and publications such as the Mental Health Gap Action Programme (mhGAP), WHO's Mental Health in Nations Development (MIND), Comprehensive Mental Health Action Plan 2013 to 2020 as well as high-level meetings on NCDs including mental health made way for its inclusion in the SDGs in 2015 (Mills, 2018).

Globally, about 16% of the world's population were affected by mental and substance disorders in 2016. They also accounted for 7% of the global burden of diseases (GBD) and 19% of years lived with disability (Rehm & Shield, 2019). Direct and indirect global economic costs of mental disorders were estimated at US$2.5 trillion in 2010 (Trautmann et al., 2016) and is projected to cost US$16 trillion by 2030 determined by the fact that mental disorders begin early in life and lead to the loss of productivity over the course of life of individuals. Mental disorders in SSA countries constitute 14% of the GBD (Wakida et al., 2018), and the burden of mental disorders in SSA has been estimated to significantly increase by 130% (45 million YLDs) by 2050 (Charlson et al., 2014). According to Institute of Medicine (2010), mental and neurological disorders have worse outcomes in SSA compared to the HICs yet, resources to prevent, diagnose and treat mental and neurological disorders are limited (Norris et al., 2016). Given the projected global burden and cost of mental disorders and the susceptibility of SSA countries to mental illness outcomes, there is an urgent need to study mental disorders over time in order to mitigate their effect on the population through planning.

2.3 Conceptualizing Mental Health

Concepts such as mental health, mental well-being, mental health problems, psychological distress, mental illness, and mental disorders have been used in various studies to depict various psychological and emotional states of individuals. Mental health, used synonymously with mental well-being does not have a universally agreed-upon definition (Mills, 2018). It has been defined by the WHO as "... *a state of well-being in*

which the individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community" (WHO, 2004, p.10).

Mental health problems, mental illness and mental disorders, used synonymously in De Silva & Roland (2014) and other studies comprise of "*medical conditions that affect a person's thinking, feeling, mood, ability to relate to others, and daily functioning"* (Mills, 2018, p.849). They encompass a variety of conditions such as depression and anxiety, drug and alcohol abuse, and schizophrenia (De Silva & Roland, 2014).

Conceptually, distinctions have been made between mental health and mental illness. According to Keyes (2005), mental health is a complete state where individuals do not experience mental disorders but rather social, psychological and emotional wellbeing. Keyes argues that individuals may not have a diagnosable mental disorder, or may not necessarily feel sad as persons with depressive disorders do, but then they may not experience high levels of happiness. Such persons, though not depressed are not mentally healthy because they do not have a complete state of psychological or emotional wellbeing. This is further supported by Bhugra et al., (2013) who add that mental health is a balanced state where "*the individual is at peace with themselves, is able to function effectively, socially, and is able to look after their own basic needs as well as higher function needs"*(Bhugra et al., 2013, p.3).

In addition to the conceptual distinctions identified in various Western literature, Frisch, Cornell, Villanueva, and Retzlaff (1992), Ryff and Keyes (1995) and Keyes (2005) studying samples of adults from United States empirically validate distinctions between mental health and mental illness. Correlations between mental health measures such as psychological well-being and mental illness measures such as depression revealed a modest negative relationship (from r= -0.40 to r= -0.55) (Slade, 2010). In addition, the factor

analysed latent mental illness and mental well-being variables in Frisch et al.'s (1992) study showed that though they were related, they were distinct as most of the variance in mental illness measure were explained by other factors than mental health (subjective well-being) measures.

Despite the conceptual distinctions and empirically validated distinctions of the concepts, mental illness and mental health measures have been used analogously in some quantitative studies (Sipsma et al., 2013; Greif & Dodoo, 2015; Salom et al., 2015). Contrastingly, other quantitative studies have distinguished between both measures by using mental well-being measures for mental health and/or mental illness measures for mental ill health (Keyes, 2005; Slade, 2010; Gruebner et al., 2012; Gao et al., 2014).

Societal and cultural conceptualisations of mental health have been noted to be critical to explaining mental health experiences and health-seeking behaviour (Patel, 1995). Qualitative studies, including anthropological studies exploring cultural-specific conceptualisations of health and illness have indicated that the worldview, social norms and expectations of a society influence their conceptualisation of health including mental health (Omonzejele, 2008; Patel & Stein, 2015).

Further, there exists cross-cultural similarities and differences in worldviews, beliefs and social norms, accounting for comparable and varied conceptualisation of mental illness across societies. For example, like the Western conceptualisation of mental health, some African societies view mental illness as distinct from mental health and also consider mental health fundamental to health (Patel, 1995; Omonzejele, 2008). In addition, some classification of mental disorders are in consonance with Western diagnostic criteria. For instance, Opare-Henaku & Utsey (2017) in their exploration of cultural conceptualisations of mental illness of Akans reported that a wide range of symptoms mentioned by respondents were similar to those indicated in the Diagnostic and Statistical Manual of

Mental Disorders (DSM-IV-TR) and the 10th Revision of the International Statistical Classification of Diseases (ICD-10). However a dissimilarity is the view that mental illness is synonymous to psychotic behaviour hence all mental health conditions are physically apparent (Kpobi & Swartz, 2018). Also, they considered difficulty in social functioning with disordered thought being primary features of mental disorders (Opare-Henaku & Utsey, 2017). Fortes & Mayer (1966) reported similar results among the Tallensi who considered mental illness as comprising of a deficit in social, religious and economic functioning. Further, according to Akyeampong (1995, 1996), the Western society's definition of health only as the absence of disease is not in consonance with that of the Ghanaian traditional society as for instance Akans regard a man who does not have any physical or mental disease to be ill if he is unable to perform the socioeconomic roles expected of him by the society. Hence, they consider economic wellbeing as constituting health. Another distinction is that, while mental disorders are conceptualised in developed contexts as a medical condition, in some African societies they are conceptualised as a spiritual condition, specifically "illnesses of the spirit" (Patel & Stein, 2015).

Mental disorders have been grouped into mood disorders (depression) and anxiety disorders also known as common mental disorders (CMDs), personality disorders, psychotic disorders (e.g. Schizophrenia), eating disorders, trauma-related disorders and substance abuse disorders (APA, 2000).

2.4 Common Mental Disorders: A Global Overview

The prevalence of CMDs varies across populations with twelve-month prevalence ranging from 5% to 20% (Patel & Stein, 2015). Depressive disorders, anxiety disorders and somatization in primary health care settings are known as CMDs because they are highly prevalent in many populations (Patel & Stein, 2015; WHO, 2017). Epidemiological studies have shown the existence of geographical variations and gender differences in CMDs (Patel & Kleinman, 2003; Steel et al., 2014). For instance, a review and meta-analysis by Steel et

al., (2014) found a higher lifetime prevalence of CMDs (39.7%) among English-speaking high-income countries compared to other high-income and low- and middle-income countries. In addition, they found a higher prevalence of mood and anxiety disorders among women and substance use disorders among men for both 12-month and lifetime prevalence (Steel et al., 2014). Institute of Medicine (2010) points out that in SSA, alcohol and substance abuse, gender-based violence, civil conflicts and wars, HIV/AIDS and other childhood diseases may be the cause of CMDs yet, they have not received much attention from governments.

A lower prevalence of CMDs in LMICs in SSA reported by Steel et al., (2014) has been supported by findings from Baxter, Scott, Vos, & Whiteford (2013) and Ferrari et al., (2013). However, Abbo, Odokonyero, & Ovuga (2019) note and explain that the burden of mental disorders in African countries are highly underreported and are currently increasing as a result of social, political and economic factors. In addition, the scarcity of data on mental health in the developing countries could account for the reduced rates of CMDs (Mohit, 2006). The World Mental Health Surveys estimated 12-month prevalence of CMDs to be 5% in South Africa and 16% in Nigeria (Patel & Stein, 2015).

Anxiety disorders comprise of mental disorders identified by feelings of anxiety and fear. Depressive disorders are marked by symptoms of sadness, diminished interest in daily activities previously enjoyed, feelings of guilt, tiredness, low self-esteem, disturbed sleep or appetite and poor concentration (APA, 2000; WHO, 2017) for most of the day, nearly every day for at least 2 consecutive weeks (APA, 2000). Major Depressive Disorder and Dysthymia are types of Depressive disorders. Depression affects 4.4% of the world's population (WHO, 2017). It is a leading cause of morbidity as it accounted for 4.3% of the GBD in 2016 and 11% of YLD (Stanaway et al., 2018). Depression is also a leading cause of suicide and CVD-related mortality (Ferrari et al., 2013; Kessler & Bromet, 2013; Hawton et al., 2013; Patel & Stein, 2015). Over two decades, the burden of depression increased by

about 38% as a result of population growth and ageing (Ferrari et al., 2013). Liu et al. (2019) reported a 50% increase in the number of persons with depression in all geographical regions between 1990 and 2017. They further revealed that, the age standardised incidence rate of depression was highest in Lesotho (6.59 per 1000) and lowest in Myanmar (1.28 per 1000) within the same study period. Further, Central and Western SSA recorded a 124.54% and 124.42% increase in depression respectively (Liu et al., 2019).

2.5 Depression in sub-Saharan Africa

LMICs bear 80% of the burden of YLD associated with depression (WHO, 2017; Daré et al., 2019). Despite this, less than 10% of persons with depression in these settings have access to treatment (Sweetland et al., 2014; Daré et al., 2019). A body of literature examining the influence of social change on mental disorders have noted a myriad of factors accounting for an increased prevalence of mental disorders in precolonial and post-independence Africa (Akyeampong et al., 2015).

In pre-independence Africa, increased migration to urban centres, which led to weakening of kinship ties, and the emergence of new elites contributed to increased prevalence of mental disorders (Akyeampong et al., 2015). Social, political, and economic change such civil wars in the 1960s, 1970s, and 1990s, economic decline due to the droughts in the sahelian region in the 1970s and global petroleum crisis in 1970s, structural adjustment programmes, in addition to the HIV/AIDS pandemic in post-independence Africa led to an increase in mental disorders in post-independence Africa (Akyeampong et al., 2015; Abbo et al., 2019).

Despite depression contributing significantly to disability in populations, there have been only a few studies on depression in African countries such as Ghana, Nigeria, South Africa and Kenya compared to HICs (Gorrindo et al., 2013; Whiteford et al., 2013; Ambugo, 2014; Glantz et al., 2014; Thapa et al., 2015; Cabello et al., 2017; Sankoh et al., 2018).

The types of studies conducted on depression in SSA in the past six decades have been national, community and facility-based (Glantz et al., 2014; Baron et al., 2016; Taukoor et al., 2017). Majority of these studies have been conducted mostly in Southern Africa compared to West Africa and other parts of the continent. The relatively small body of literature on mental health and depression in SSA have been cross-sectional and mental health has mostly been associated with other public health issues such as maternal and child health (Baron et al., 2016; Pellowski et al., 2019), and HIV/AIDS (Sikkema et al., 2011). In confirmation, 85% of the 115 studies on CMDs reviewed in a systematic review of epidemiological evidence of CMDs in LMICs conducted by Lund et al. (2010) were cross-sectional.

2.5.1 Depression in Ghana

Early anthropological studies on mental health in colonial and the independence period in Ghana noted that depression, acute transient fear-psychosis and schizophrenia were the common mental illnesses observed at shrines in rural Ashanti Region (Field, 1958). Depressed persons most often reported at shrines with self-accusation of witchcraft which was an affirmation of guilt, a typical symptom of severe depression (Field, 1955, 1958). In contrast, findings of Fortes & Mayer's (1966) study revealed that self-accusation of witchcraft was only characteristic of depressed patients from Southern Ghana and not among Tallensi depressed patients of Northern Ghana. Fortes & Mayer (1966) also indicated that there had been an increase in prevalence of mental disorders after independence due to changes in the traditional social structure (Fortes & Mayer, 1966).

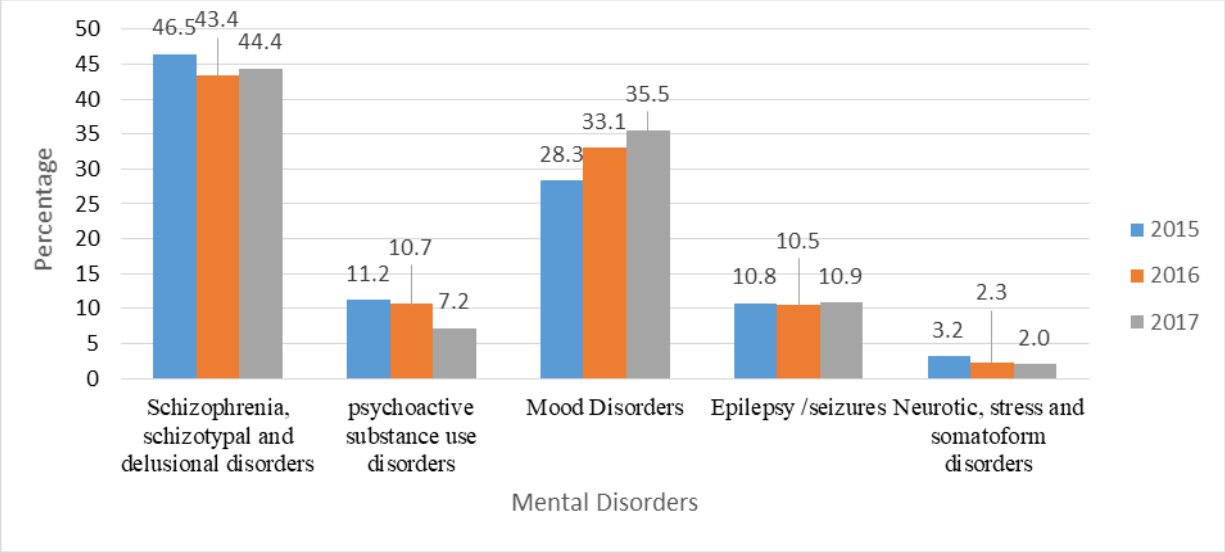
Building up on mental health research in Ghana since independence, there has been epidemiologic population-based national surveys, community and hospital-based studies conducted on psychotic disorders, substance use disorders, psychological distress, anxiety and depression over time. With hospital samples, depression has been studied among persons with chronic conditions such as renal disease (Ganu et al., 2018), breast cancer

(Calys-Tagoe, Senaedza, Arthur, & Clegg-Lamptey, 2017; Kugbey, Oppong Asante, & Meyer-Weitz, 2019), and diabetes (Akpalu et al., 2018). Depression in stroke survivors (Safo et al., 2017) as well as outpatients at the psychiatric hospital (Poole et al., 2013), have also been studied.

Studies on other subpopulations in Ghana have considered depression among mothers (Gold et al., 2013; Guo et al., 2014; Saeed & Wemakor, 2019), adolescents (Roche et al., 2016), university students (Oppong & Andoh-Arthur, 2015), and the elderly (Law & Sbarra, 2009). In addition, depression has been studied among communities (Psaki & Hindin, 2016), urban dwellers (Dzator, 2013; Guo et al., 2014; Greif & Dodoo, 2015; Bisung et al., 2017; Adjaye-Gbewonyo et al., 2018; Kpobi & Swartz, 2018), peri-urban dwellers (Roche et al., 2016), and rural dwellers (Scorza, Owusu-Agyei, Asampong, & Wainberg, 2015; Weobong et al., 2015). There exists a longitudinal qualitative and quantitative study on subpopulations such as couples and adolescents in peri-urban communities in Ghana (Psaki & Hindin, 2016; Roche et al., 2016). However, longitudinal research on depression among adults at the population level in Ghana is infrequent.

Population-based epidemiological studies reviewed have reported estimates of 12-month prevalence of depression in Ghana as ranging from 4.3% to 7.4% in persons 18 years and above (Gorrindo et al., 2013; Ambugo, 2014). The prevalence of depression has been found to be increasing at the facility level. For example, in 1960 schizophrenia was the most prevalent condition reported at the Accra Psychiatric hospital, followed by manic depression (16%). In 2006, depression constituted the most prevalent condition (12.6%) reported (de-Graft Aikins, 2015). More recently, outpatient attendance data from three major psychiatric hospitals in Ghana (Pantang, Ankaful and Accra Psychiatric hospitals) reported mood disorders, which include depression as increasing from 28.3% in 2015 to 35.5% in 2017. This is depicted in Figure 2.1.

Figure 2.1 Trends in Causes of OPD Attendance in Three Psychiatric Hospitals in Ghana



Source: MHA, 2018

3.2.1 Healthcare Context in Ghana

The healthcare system in Ghana is organised under the public, private and traditional healthcare services. Levels of health service provision in the Ghana Health Service include the primary healthcare which is made up of the district, sub district hospitals, health centres and clinics and health posts and the secondary healthcare which consists of tertiary and regional hospitals (Awoonor-Williams et al., 2016). As at 2018 there were four teaching hospitals (MOH, 2019). There were 137 district hospitals, 855 health centres, 1003 clinics, 4185 CHPS and three psychiatric hospitals as at 2016 (CHIM, 2017). The doctor to population ratio for 2016 was 1:8,300 (CHIM, 2017). The distribution of these facilities and health staff in Ghana is uneven as most are concentrated in the urban areas and the regional capitals, particularly in the big cities of Accra, Kumasi and Sekondi-Takoradi (GHS, 2017).

Mental health care in Ghana is mainly provided by three psychiatric hospitals (CHIM, 2017). Some services are also provided in private psychiatric facilities, the psychiatric units in all regional hospitals, some district hospitals, in communities by community mental health officers (CMHO), community psychiatric nurses (CPN) (de-Graft

Aikins & Koram, 2017; GHS, 2017), community residential units (Roberts et al., 2014), traditional medicine and faith-based healing (de-Graft Aikins & Koram, 2017).

Mental health staff form 2% of the total workforce of Ghana Health Service (GHS, 2017). As at 2017, clinical staff in the three public psychiatric hospitals in Ghana were made up of psychiatrists (11), other medical doctors (23), all categories of nurses (1197), pharmacists (7), clinical psychologists (1), social welfare officers (11), clinical psychiatric officers (10) and physician assistants (49) (MHA, 2018).

Though treatable, 92% of persons living with depression in Ghana are untreated (Gorrindo et al., 2013) due to limited access to mental health services. Based on Read and Doku's (2012) review, a number of studies on mental health in Ghana have examined substance use, however, the singular influence of substance use, for that matter alcohol consumption on mental health in Ghana remains unexplored.

Qualitative studies have explored explanatory models of mental health including depression (Kpobi & Swartz, 2018). In one of such studies, case vignettes on a journalist with symptoms of depression were presented to traditional alternative medicine practitioners in Accra comprising of Pentecostal or charismatic pastors, herbalists, traditional Muslim healers, and shrine devotees or medicine men for comments. They attributed causes of mental disorders, including depression to supernatural causes through immoral or deviant behaviour, curses, witchcraft, evil spirits and other factors as stress, brain injury, alcohol abuse and genetics (Kpobi & Swartz, 2018). Hence, there is a consensus between qualitative and quantitative evidence on the influence of alcohol use on mental health.

2.6 Alcohol Use: A Global Overview

Alcohol use and abuse are crucial public health issues globally as they contribute significantly to disability and mortality. In 2016, it accounted for 2.8 million deaths which corresponds to 2.2.% and 6.8% age-standardised female and male deaths respectively (Griswold et al., 2018). Consumption of alcohol has been linked to many acute and chronic conditions (Room et al., 2005; Rehm et al., 2017). As a cause of disability, it accounted for 8.9% and 2.3% of disability-adjusted life years (DALYs) for males and females (Griswold et al., 2018). About 55% of the world's population has ever consumed alcohol, and 11.5% of drinkers report heavy drinking of more than two drinks per week (Witkiewitz & Stauffer, 2014). In 2010, 6.2 litres of pure alcohol per person aged 15 years and older was consumed worldwide (MOH, 2016). Current drinkers of alcohol globally were 32.5% of which 25% were females and 39% were males (Griswold et al., 2018). In 2016, prevalence of alcohol consumption was highest in HICs with 83% of males and 72% of females being current drinkers and lowest in LMICs with 20% of males and 8.9% of females being current drinkers. Average daily consumption was 0.73 standard drinks[2] a day for females and 1.7 standard drinks for males (Griswold et al., 2018).

The subsequent paragraphs present the social and cultural context of alcohol use in Western societies, SSA and Ghana. For culturally sensitive policies, there is the need to understand the sociocultural settings within which people consume alcohol given that it accounts for the differential patterns of alcohol use across cultures.

Alcohol has been widely used in many cultures since historical times (Babor et al., 2010; Nelson, 2004). Before the modern age, fermented alcoholic beverages were consumed throughout many village societies across Europe. Most often, traditional societies that produced alcoholic beverages such as wine and beer did so on a small-scale using surplus

[2] Average standard drinks were 10g of pure ethanol per serving (Griswold et al., 2018)

from agricultural produce such as cereals, fruit, barley, and honey in households (Nelson, 2004; WHO, 2014). Alcohol was therefore consumed occasionally and communally during specific communal festivals. To date patterns of this tradition exist in various settings in Europe (WHO, 2014). With modernisation and its related process of industrialisation in European countries, new types of beverages, production, distribution, and promotion modes emerged along with its consequent changing patterns of use. Distilled alcoholic drinks became increasingly available during the era of colonisation and in recent times via globalisation, which has served as public health risk to many societies (Rehm et al., 2009). In view of this, many countries have implemented policies to control the intake of alcoholic drinks (Rehm et al., 2009).

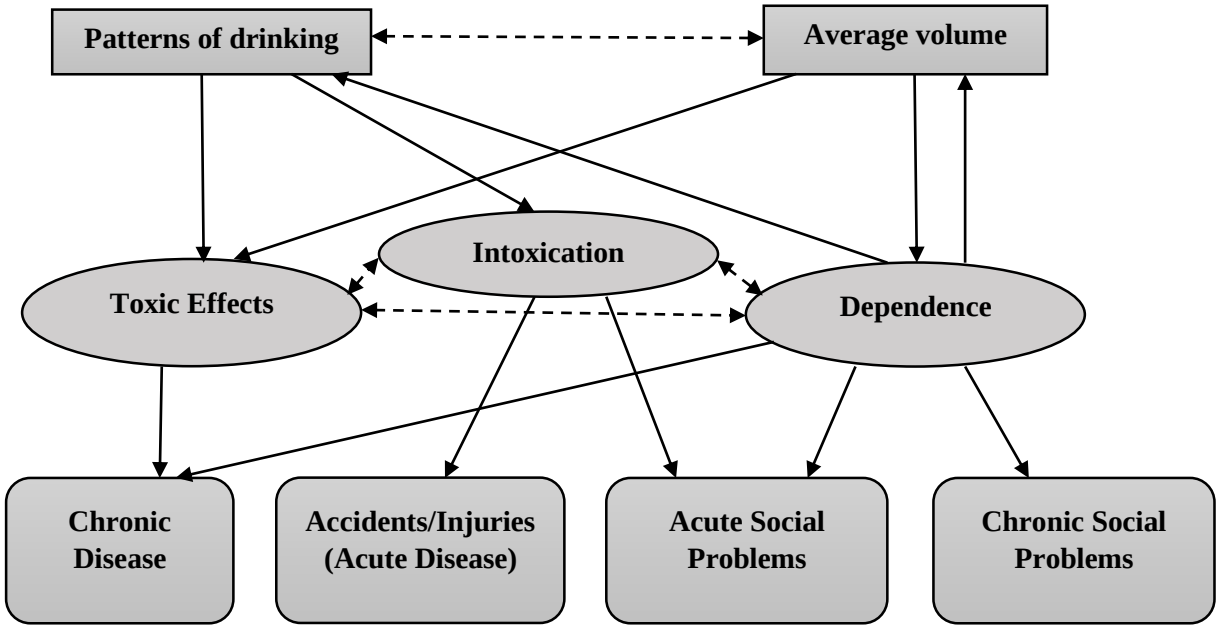
A framework by Babor et al. (2010) in Figure 2.2 portrays the biological and social pathways via which various doses of alcohol consumption could harm individuals. They further indicate that alcohol consumption (drinking patterns), characterised by frequency and volume of drinking leads to toxic effects on the organs and tissues, intoxication and dependence which in turn result in various social problems and or chronic and acute diseases.

Noting the conduits by which excessive alcohol consumption leads to chronic and acute social problems, Babor and colleagues state that intoxication results in individuals' inability to fulfil social roles associated with family, school, job, challenges with social networks and public misdemeanour (Babor et al., 2010; Glantz et al., 2014). The effect is far-reaching as at the level of the society, intoxication of individuals leads to loss of productivity in the workplaces, violence, accidents and their related injuries (Babor et al., 2010).

They also explain that sustained drinking leads to alcohol dependence, high volume drinking leads to intoxication and binge drinking leads to toxic effects such as alcohol

poisoning, acute pancreatic disorder, cancer among others (Babor et al. 2010). A systematic review of reviews by Rehm et al., (2017) examining various biological pathways of levels of alcohol consumption to chronic disease burden corroborates Babor et al.'s (2010) findings that alcohol's influence on various social problems and chronic diseases are dose-dependent. Rehm and colleagues further categorise chronic diseases into those which are 100% attributable to, and those that are partially attributable to alcohol consumption. Conditions that are 100% attributable to alcohol use include alcohol use disorders, alcohol poisoning and foetal alcohol disorders. Conditions, which are partially attributed to alcohol use, are jointly caused by alcohol consumption and biological, other lifestyle factors or condom use decisions. They include HIV/AIDS, STIs, lower respiratory infections, cancers, diabetes mellitus, neuropsychiatric disorders and major depressive disorders (Rehm et al., 2017).

Figure 2.2 A Framework on the Pathways of Volume and Patterns of Alcohol Consumption to Physical and Social Harm



(Source: Babor et al., 2010, p. 14)

2.6.1 Alcohol Use in SSA

Early African history of the development of brewing or fermentation of alcoholic beverages is unknown but several hypotheses of origin date it back to the biblical Hamites in the 19th and 20th century BC and before 3400 BC in Egyptian mythology (Platt, 1955).

Traditional alcoholic beverages in precolonial, colonial and postcolonial Africa include fermented honey water, fruits and juices, milk and sap from various palm plants and bamboo (Platt, 1955). Beers from sorghum, maize, millets, cassava flour, and plantains also exist. During the colonial era in the 18th and 19th centuries, alcohol in the form of rum and gin were imported from Europe to African colonies (Akyeampong, 1996, 2003). Alcohol served a culturally unifying purpose and played an important role in traditional social life (Adomakoh, 1976) of many communities. For instance, among the Nandi of Kenya, it was expected that a Nandi would hold a beer party. When he did not, he would lose his social standing and would be regarded as mean. His neighbours would not invite him to their beer parties (Platt, 1955). Again, to depict its social importance, Platt (1955, p.118) quotes, *"Abundance of beer is the glory of a commoner's hospitality, or a chief's court"*.

Over time, some traditional beverages were distilled into spirits which were described as more potent (Platt, 1955). They became a lucrative source of income during colonial rule (Akyeampong, 1994, 1995, 1996). Post-independence economic and political change influenced patterns of alcohol consumption. There was a transition from the traditional subsistence system to a cash economy hence, drinking patterns in the urban contexts were more to relieve workers who had migrated to the urban areas from stress, anxiety, and tension that characterised the cash economy. With this, locally distilled spirits were mainly consumed in the urban towns (Adomakoh, 1976; Akyeampong, 1996) while the traditional beverages were consumed in the rural areas. There also existed breweries that produced European beers and spirits during the colonial and post-independence era with

drinking patterns in urban areas resembling that of other parts of the world (Adomakoh, 1976; Myadze & Rwomire, 2014).

Concerning alcohol consumption, Adomakoh (1976) categorised African societies into permissive groups, which were made up of traditionalists and Christians, and non-permissive groups made of Muslims. The permissive group viewed alcohol use as acceptable and formed part of their communal, ceremonial and social activities. Alcohol was a vital element of rites of passage such as naming ceremonies, baptism, marriage and funerals and social drinking took place during these ceremonies as well as Christian festivities such as Easter and Christmas (Adomakoh, 1976).

Among the permissive groups, the use of alcohol was widespread such that they overlooked its potential dangers. They attributed physical strength and aphrodisiac abilities to the alcoholic drinks and high concentrations of alcohol were seen as remedies for gastrointestinal tract parasites (Adomakoh, 1976). Despite these, traditional systems and temperance societies existed to ensure moderation in social drinking (Akyeampong, 1996). According to Acheampong (1996), the Wesleyan Missionary Society in Gold Coast advocated for total prohibition of alcohol, unlike other churches. Hence, permissiveness of alcohol use was not uniform across all Christian groups as suggested by Adomakoh (1976). With the non-permissive group, alcohol production, transporting, selling, buying, serving, consumption is prohibited (Devasahayam, 2003; Michalak & Trocki, 2006). It has been stigmatised and individuals engaging in its consumption in some Islamic countries are severely punished (Michalak & Trocki, 2006). Despite its prohibition, drinking of alcohol has not been eradicated as minority groups in Islamic societies produce and consume alcohol. Michalak and Trocki (2006) further reveal illicit consumption of alcohol among some Muslims. Nonetheless, statistical estimates show alcohol consumption as the norm for permissive groups or societies and abstension as the norm for non-permissive groups. For instance a WHO report on alcohol consumption reports high rates of 12-month abstention,

that is 80% and above and low rates of alcohol abuse in Muslim-majority countries in North Africa and in the Eastern Mediterranean Region (WHO, 2018).

In contemporary times, rapid urbanisation and adoption of Western lifestyles by populations in many SSA societies have transformed traditional practices that regulate the use of alcoholic beverages. There has been an expansion of the alcohol industry over time (Ferreira-borges et al., 2017) and a high proportion of drinkers consume both foreign and locally brewed alcoholic drinks. One-third of alcohol consumed is unrecorded as they are home-brewed (Ferreira-borges et al., 2017). The unknown potentially dangerous quantities of impurities, contaminants and volume make homemade alcohol dangerous to consume (Asare, 1999). In 2010, Southern African countries such as South Africa and Namibia recorded the highest alcohol consumption levels on the continent. The least consumption levels were found among persons in Niger, Guinea and Senegal who are predominantly adherents of Islam (Ferreira-borges et al., 2017). A recent global study has also reported that, in 2016, about 20% of current drinkers of alcohol in LMICs were males and 8.9% were females (Griswold et al., 2018).

2.6.2 Alcohol Use in Ghana

Like other African societies, traditional alcoholic beverages have been consumed in Ghana since the precolonial era. They comprise of pito, brukutu, palm wine, akpeteshie among others. Palm wine and akpeteshie have been widely consumed compared to pito (Glover et al., 2005). Pito and brukutu have been used mostly in Northern Ghana (Asare, 1999). Pito made of maize, millet or sorghum formed part of items for bride wealth payment in the Northern part of Ghana (Mendonsa, 1972).

Akyeampong (1996) using pieces of information from various ethnographic studies of 17th century to 19th century, outlines the history and changes in alcohol use among the Akan, Ewe and Ga-Adangme of Ghana. He indicates that the mythical origin of palm wine,

the earliest recorded traditional drink in the history of Gold Coast has been enshrined in oral tradition.

In precolonial Gold Coast, alcohol in the form of palm wine was the preserve of chiefs, military aristocrats, male elders and merchants. In the Akan and Ga societies, alcohol use among women was viewed as unacceptable and with the less centralised Ga-Adangme society, women drank little (Akyeampong, 1996). In addition, drinking by young men, even in their 20s was frowned upon. There was mostly communal drinking and drinking in solitude was considered antisocial and discouraged as drunkenness was stigmatised and the individual's family or clan could be stigmatised as drunkards.

Alcohol was used for ritual and social purposes, an indicator of social status and unifier. The worldview of the traditional Ghanaian society believed in the existence of a supreme being who created the lesser gods, and ancestors as well as the existence of forces such as magic, sorcery and witchcraft (Adinkrah, 2019). Their belief in the supernatural influenced their use of alcohol for rituals during rites of passage and festivals (Smith, 2001). As a mark of social status, alcohol was the preserve of chiefs, male elders and merchants especially as they exercised control over land, labour and had more access to palm wine, rum and gin (Akyeampong, 1996). Alcohol unified the various communities because it served as a means of social interaction and communicating with the ancestors. With social and cultural transformation through the depression of the 1930s, rapid urbanisation, restrictive legislation on akpeteshie among others, more young men consumed alcohol in solitude in colonial and independent Ghana. This changed the patterns of alcohol consumption to more of hazardous use as the traditional control of alcohol by elders had waned. Increased use of alcohol among women was also reported (Akyeampong, 1996).

The most recent population level estimates of alcohol consumption in Ghana showed that, total alcohol per capita consumed by persons 15 years and older in 2010 was 20.6 litres.

Males consumed 23.6 litres whereas females consumed 13.9 litres. Beers constituted 30% wine (10%), spirits (3%) and other locally brewed alcoholic drinks (57%) of what was consumed in that year (WHO, 2014; MOH, 2016). Persons 15 years and above who were lifetime abstainers, former and current drinkers in 2010 were 64.1%, 12.6% and 23.3% respectively (WHO, 2014; MOH, 2016). Since 2006, the consumption of other locally brewed alcoholic drinks has increased (WHO, 2014).

The Ghana National Alcohol Policy was recently implemented. There exist legislations on alcohol production and consumption in Ghana but they are not coordinated and strictly enforced (MOH, 2016). Resultantly, many of the local drinks brewed by local distillers are not monitored in terms of quality, volume of alcohol and raw materials used in producing them (MOH, 2016). A development over time in Ghana is the mass media advertisements, which link alcohol to sexual performance, success, sports and part of the national tradition. This corresponds to an increase in the production of herbal-based liquor and, or importation of pocket-sized easy to carry alcohol sachets. The use of humorous music in TV and radio advertisements makes it more appealing to persons, encouraging an increased consumption of alcohol in Ghana (de Bruijn, 2011). Recently, measures to regulate alcohol advertisements in Ghana have been undertaken. In 2013, the Food and Drugs Authority (FDA) guidelines for the advertisement of food indicated that alcoholic beverages should not be advertised as increasing sexual performance, success, sports, pleasure, appetite and solving one's physical, social problems (FDA, 2013). In 2018, the FDA of Ghana banned alcohol advertisements and live mention of alcoholic beverages by presenters in the media before 8:00pm (Doku, 2018). In January 2020, Ghanaian celebrities and popular individuals were banned from featuring in alcoholic beverage advertisements ("Legal Issues Involved in FDA Ban on Celebrities Featuring in Alcohol Adverts," 2020).

2.7 Alcohol Use and Depression

Alcohol use and mental health have been noted to be crucial public health issues as they both account for significant morbidity and mortality trends across many populations (Witkiewitz & Stauffer, 2014). Alcohol use disorder (alcohol abuse and dependence) and depressive disorder often co-occur (Witkiewitz & Stauffer, 2014). Extant cross-sectional and longitudinal literature have extensively examined the relationship and the direction of causality reporting three possible channels that form the basis of the link between heavy alcohol use and major depressive disorder (Babor et al., 2010; Rehm et al., 2017).

First, alcohol use or alcohol use disorders could lead to depression (Fergusson et al., 2009; Boschloo et al., 2012; Balogun et al., 2014; Glantz et al., 2014; Foulds et al., 2015; Churchill & Farrell, 2017). Second, depression could increase an individual's use of alcohol and hence lead to alcohol use disorders (Glantz et al., 2014; Subramaniam et al., 2017; Collins, Thompson, Sherry, Glowacka, & Stewart, 2018). Lastly, there could be a reciprocal causal relationship (Pacek, Martins, & Crum, 2013; Danzo, Connell, & Stormshak, 2017; Otten, Zwaluw, & Engels, 2018).

According to Witkiewitz and Stauffer (2014) as well as Rehm et al. (2017), there is more evidence that heavy alcohol use predicts or precedes depression rather than vice-versa. This is contrasted by a meta-analysis of 74 studies and a study of 2603 identical twins, which found depression symptoms predicting alcohol use disorders. Evidence on the subject have been inconclusive, as other studies do not find any relationship between alcohol and depression (Bajunirwe et al., 2018). Further, studies examining causality and direction of the relationship are very much lacking in limited resource contexts such as SSA, including Ghana (Abler et al., 2014; Glantz et al., 2014). As the burden of mental disorders in SSA has been projected to increase by 130% by 2050 (Charlson et al., 2014) coupled with limited resource settings bearing 80% of the burden of alcohol consumption and mental health, there is the need to study the relationship to inform policy and for timely planning.

2.8 Risk or Protective Factors of Depression and Alcohol Use

This study aims at examining the direction of the relationship between alcohol use and depression, that is whether alcohol use influenced mental health or vice versa. Hence, there is the need to examine risk factors that have been found to influence depression cross-sectionally and longitudinally on the one hand and alcohol use cross-sectionally and longitudinally on the other hand. Common risk or protective factors for alcohol use and depression in both HICs and LMICs have been noted in previous evidence reviewed (Witkiewitz & Stauffer, 2014). The subsequent sections discuss findings on them in detail.

2.8.1 Individual Social, Demographic and Economic Factors

A large volume of cross-sectional surveys and nationally representative epidemiological surveys has reported social, demographic and economic risk factors associated with depression across countries. They have identified factors such as gender, age, marital status, employment status, household wealth, food sufficiency, religion, place of residence as individual characteristics associated with depression. Cross-sectional studies are however, limited in that they are unable to predict whether the factors would remain associated with depression over time when symptoms resolve, become chronic or acute hence the need to consider longitudinal literature.

2.8.1.1 Gender

Research on gender differences in mental health has been extensive. A comparison of results from various studies shows a higher prevalence of depression for females than males (Moscato et al., 1997; Duthé et al., 2016; Bajunirwe et al., 2018). On the contrary, Lazaratou & Dikeos (2010) show higher depression scores for males as they grow older. Further, many but not all cross-sectional studies and longitudinal studies have shown gender to be significantly related to depression. For instance, Bajunirwe et al. (2018) in their cross-sectional study of depression and alcohol abuse in Uganda, Nigeria, South Africa and Tanzania, showed females having an increased odds of depression compared to males.

Contrary cross-sectional evidence from Greif & Dodoo, (2015) showed being male to be protective of one's mental health. Longitudinal evidence affirming cross-sectional findings of Bajunirwe et al. (2018) indicated females being more likely to be depressed over the four-year study period (Moscato et al., 1997).

Cross-sectional and longitudinal studies that have examined predictors of alcohol use have reported a higher proportion of men consuming alcohol than women (Lien et al., 2016; Taukoor et al., 2017; Churchill & Farrell, 2017). An epidemiological study has shown that in Western societies however, the gap in consumption of alcohol between men and women is not very wide (83% males; 72% females) compared to LMICs (20% males; 8.9% of females) (Griswold et al., 2018). For longitudinal studies, men were more likely to have an earlier onset of alcohol use and were at an increased risk of alcohol use disorders compared to females (Hasin et al., 2007).

The relationship between alcohol use and depression differed by gender. Churchill & Farrell's (2017) cross-sectional study reported positive effects of alcohol use on depression for both males and females. However, the magnitude of coefficients for females is bigger compared to males. Danzo, Connell, & Stormshak's (2017) longitudinal study indicated a significant association for females but not for males. In addition, there were also gender differences in the direction of the association. Some indicated reciprocal links between alcohol use and depression among females and not males over time (Danzo et al., 2017) while others reported reciprocal links among both males and females (Marmorstein, 2009). It is worthy to note that many of these have studied samples of adolescents or older adults in HICs.

2.8.1.2 Marital Status

Marital status was a significant predictor of depression. Among older adults, being married was associated with decreased depressive symptoms while non-married persons

over time recorded increased symptoms (Law & Sbarra, 2009). There was an increased likelihood of depressive symptoms among both younger (54 years or less) divorced or widowed women and men over time compared to young, married women and men. Among older women (75 to 85 years) however, there was no significant difference between those married and not currently married women as depression symptoms increased among them all over time (Law & Sbarra, 2009). Contrasting evidence shows that, older men who were divorced or widowed reported increasing symptoms of depression compared to their currently married counterparts (Jang et al., 2009). This means, being currently married protected younger men and women as well as only older men from depression. Older women regardless of their marital status were depressed over time.

In a relatively younger sample, divorced and never married persons had higher odds of depression compared to married persons over time (Tomita & Ramlall, 2018).

Pertaining to marital status as a predictor of alcohol use, some cross-sectional evidence did not find marital status predicting alcohol use (Subramaniam et al., 2017).

2.8.1.3 Age

In some cross-sectional and longitudinal studies, age was not found to be significantly related to depression (Greif & Dodoo, 2015; Bajunirwe et al., 2018). On the contrary, other cross-sectional studies considering depressive symptoms among high school students in Athens and older adults in Norway, United Kingdom, Ghana, Kenya and South Africa found higher age predicting depression scores (Lazaratou & Dikeos, 2010; Ambugo, 2014; Thapa et al., 2015). Longitudinal evidence corroborated the cross-sectional findings on age being significantly related to depression (Tomita & Ramlall, 2018).

Pertaining to alcohol use, there was no statistically significant relationship between age and alcohol use among a sample of outpatients in a psychiatric unit (Subramaniam et al., 2017).

2.8.1.4 Socioeconomic Status

Household wealth, income, employment and education have been used as measures of socio-economic status in studies on mental health. Studies have shown that being of a high or low socioeconomic status could serve as a significant source of stress to individuals hence increase mental disorders in the population. A systematic review of cross-sectional and longitudinal epidemiological evidence of CMDs in LMICs conducted by Lund et al. (2010) found a consistency of association between income and CMDs. Half of community-based cohort studies and facility-based studies on income reviewed reported a positive relationship between low income and CMDs. Another cross-sectional study comparing two Western and two African countries reported a positive relationship between household wealth and depression. The study reported that, a unit increase in household wealth score was associated with higher odds of depression among persons 18 years and older in United Kingdom, Ghana, and Kenya. The reverse was true for Norway (Ambugo, 2014).

2.8.1.5 Household Debt

Two recent longitudinal studies conducted in United States and three European countries reported a positive relationship between household debt and depression (Berger et al., 2016; Hiilamo & Grundy, 2018). The first study reveals that for households in the United States, short-term rather than long-term household debt is positively related to higher levels of depressive symptoms. This relationship is particularly evident among 51-66 year old unmarried adults (Berger et al., 2016). The second study conducted among older adults in Germany, Belgium and France reported a strong positive association between substantial financial debt of more than €5000 and depressive symptoms (Hiilamo & Grundy, 2018). Contrastingly, a cross-sectional study in the North West province of South Africa found no association between household debt and depression after controlling for other household and economic measures (Docrat et al., 2019).

2.8.1.6 Employment Status

A systematic review of 115 studies on the relationship between poverty and CMD in 33 LMICs indicated that, a little over half of community-based studies examined showed a positive relationship, at both the bivariate and multivariate levels of analysis, between unemployment status and CMD (Lund et al., 2010). They further revealed that, this finding was consistent across longitudinal, cross-sectional and case-control studies. Limiting their review of cross-cultural epidemiological literature to one CMD, specifically depression, Kessler & Bromet (2013) and Ambugo (2014) affirmed Lund et al.'s (2010) finding. Kessler & Bromet (2013) reported that repeatedly in many countries, unemployment predicted depression in individuals. Ambugo (2014), who conducted a cross-country study on socio-demographic characteristics associated with major depressive episode, also showed that, employed persons in the United Kingdom had lower odds of major depressive episode compared to their unemployed counterparts.

With respect to alcohol use among persons with depression, an outpatient clinical study found that gainfully employed and unemployed persons were more likely to hazardously use alcohol compared to students (Subramaniam et al., 2017).

2.8.1.7 Level of Education

Generally, studies reported reduced levels of depression with higher levels of education (Ambugo, 2014; Tomita & Ramlall, 2018). For instance, a unit increase in years of education reduced the odds of depression in respondents from the United Kingdom, Ghana and Kenya (Ambugo, 2014). This finding is confirmed in the study conducted by Tomita & Ramlall (2018) who use three waves of panel data from the nationally representative South African National Income Dynamics Study.

2.8.1.8 Food Insecurity and Hunger

The insecurity of food, an indicator of deprivation, has been noted to be a significant stressful life event in both HICs and LMICs, which increases the risk of depression. Cross-sectional and longitudinal studies reviewed from Western and SSA countries affirm the negative influence of food insecurity and hunger on depression (Lund et al., 2010; Sorsdahl et al., 2011; Tsai et al., 2016). In their systematic review of cross-cultural, cross-sectional, case control and longitudinal evidence on poverty and CMD, Lund et al., (2010) assert that both bidirectional and multivariate results showed a positive association between food insecurity and CMD in LMICs. Additionally, Sorsdahl et. al. (2011) in their study of 4185 adults in South Africa indicated that individuals from households that did not have enough food sometimes were more likely to have 12-month and lifetime mental disorders including major depressive episode. The association was affirmed in a randomised control trial study of depression in pregnant women in Cape Town. The effects of depression on these women were however lessened by high levels of instrumental social support (Tsai et al., 2016).

2.8.1.9 Religion

Previous and current literature has supported the benefit of religion, religious involvement and religiosity to decreased symptoms of depression (Levin, 2010; Blazer, 2012). A seminal study investigating the influence of religious affiliation on a mental health outcome (suicide) in the 19th century reported that Catholics were less likely to commit suicide compared to Protestants in Europe (Durkheim, 1951). Since then, the growing body of empirical studies have measured various aspects of religion such as religious beliefs, religious participation, and religiosity. There have been various scales to measure indicators of religion and spirituality (Blazer, 2012).

A recent review of research on religion and mental health explains the benefit of religion to mental health in three ways: First, an individual's devotion to a religious belief system could encourage healthy behaviour as they stipulate eschewing anti-social behaviour

and substance use such as alcohol, tobacco and drugs (Levin, 2010). Second, involvement in religious organisations sets one in formal or informal social networks, which could serve as a source of emotional, tangible, informational, and appraisal support (Levin, 2010). Last, individual or group worship could foster virtues such as humility, gratitude forgiveness and love all which could alleviate psychological distress (Levin, 2010). Some longitudinal studies have found church attendance and religious involvement to be protective of the occurrence of depression among a sample of young persons (Tomita & Ramlall, 2018), and older adults (Law & Sbarra, 2009).

2.8.1.10 Place of Residence

More than ever before, many societies have been characterised by rapid urbanisation. A number of cross-sectional and longitudinal studies from HICs and LMICs have highlighted the influence of urban or rural residence on depression. In the urban context, local disorder such as delinquency, crime, substance use, poor sanitation, and urban poverty increase prevalence of depression (Greif & Dodoo, 2015). Correspondingly, various socioeconomic structural factors in Accra, including ethnic diversity and owning a house were found to be related to depression (Bisung, Kangmennaang, & Luginaah, 2017). Some cross-sectional studies report 12-month prevalence of depression to be higher among urban dwellers than rural (Adjaye-Gbewonyo et al., 2018). Studies on depression in peri-urban contexts are a few. Peri-urban settings are characterised by a coexistence of traditional and modern values and attitudes characteristic of both rural and urban areas hence may characterise distinct trends of depressive disorders. There is therefore the need for studies in such areas to inform meso-level policy. Another longitudinal cohort study in four rural communities in Ghana found antenatal depression predicting post-natal depression among women in their reproductive ages (Weobong et al., 2015).

2.8.2 Other Lifestyle and Health-related Factors

2.8.2.1 Smoking

The co-use of alcohol and tobacco causes alcohol to interact with tobacco and acts as a solvent for tobacco carcinogens (Rehm et al., 2017). This has been noted to cause significant physical and mental harm. Pacek et. al. (2013) have highlighted a bidirectional relationship between smoking cannabis and depression. In addition, they found a longitudinal relationship between co-use of alcohol and cannabis and depression. A cross-sectional clinical study on alcohol use among outpatients in a psychiatric institution found that, persons who smoked were more likely to hazardously use alcohol compared to persons who did not smoke (Subramaniam et al., 2017). A longitudinal study of adult veterans in United States investigating the temporal sequence of the relationship between depression, hazardous alcohol use and other substance use reported smoking preceding hazardous alcohol use. In the same study, marijuana was found consistently predicting higher depressive symptoms among veterans with HIV (Ruggles et al., 2016). In four emerging countries including Ghana, smoking daily and non-daily was longitudinally associated with persistent depression (Cabello et al., 2017).

2.8.2.2 Body Mass Index (BMI)

Modifiable risk factors including BMI have been found to be bidirectionally associated with mental health. A prospective longitudinal study of youth in the United States found that obesity predicted depression among women during ages 27 to 30 years. Men who were obese were less likely to be depressed (McCarty et al., 2009). A contrasting evidence from a cross-sectional study of outpatients in a psychiatric unit in Singapore found that the patients' BMI did not significantly predict depression nor hazardous alcohol use (Subramaniam et al., 2017).

2.8.2.3 Physical Activity

According to Teychenne st. al. (2008), most observational and intervention studies reviewed reported duration, both shorter and longer, and vigorous intensity of physical activity predicting lower levels of depression. Mammen & Faulkner (2013) affirm this finding in another systematic review of 30 studies. They reveal that over 85% of studies reviewed showed consistent evidence of physical activity levels, whether high or low compared to no activity preventing depression over time. Stavrakakis et al., (2012) reported similar finding among adolescents from Netherlands.

2.8.2.4 Chronic Conditions

The link between chronic physical diseases such as diabetes, stroke, cancer, liver disease, heart disease, other mental disorders and depression has been noted in a large number of studies (Poole et al., 2013; Calys-Tagoe et al., 2017; Safo et al., 2017; Akpalu et al., 2018; Ganu et al., 2018; Daré et al., 2019; Kugbey et al., 2019). Studies reviewed have noted a higher prevalence of depression among patients with chronic diseases compared with the general population. While some have studied the number of chronic physical condition, others have focused on the types of chronic physical condition. Ambugo's (2014) study for instance, showed that among all four countries studied, that is Kenya, Ghana, Norway and United Kingdom, persons with one or more chronic conditions had higher odds of depression. On the type of chronic physical condition, diabetic patients, stroke survivors, cancer patients, long-term haemodialysis patients and persons living with heart diseases were found to have higher depressive symptoms.

Various levels of alcohol use have been linked to chronic diseases (Rehm et al., 2017). High volumes of consumption have been reported to cause cancers, diabetes, CVDs, liver cirrhosis, and pancreatitis (Room et al., 2005; Babor et al., 2010; WHO, 2011; Rehm et al., 2017; Griswold et al., 2018; WHO, 2018).

2.8.2.5 Social Capital

According to Almedom (2005) social capital, a complex construct is a general term used for social support, social cohesion, social integration and or participation. Hassan and Birungi (2011) further indicate that social capital is derived from social networks, norms and trust. Dimensions of social capital such as structural and cognitive social capital, and social cohesion have been highlighted by various studies (Grootaert, Narayan, Jones, & Woolcock, 2004; Botterman, 2015). Structural capital considers the level of interaction and involvement of an individual with his or her community through participation in group meetings such as credit groups, ethnic-based community groups, NGOs or civic groups, neighbourhood or village committees among others. Cognitive social capital refers to trust and observance of norms (Grootaert et al., 2004). While social cohesion refers to the presence of social ties and networks and absence of social conflict (Botterman, 2015). The level of order in a society is ensured by how close knit a society is.

Social capital has been linked to poverty, social exclusion and health inequalities in past and recent literature (Almedom, 2005). Several dimensions of social capital and cohesion have been related to alcohol use and depression. The presence of social networks and individuals participating in community group activities have been found to be protective against depression as they serve as buffers to cope with and mitigate the effects of depression (WHO, 2014; Tsai et al., 2016). Other studies reporting contrasting findings emphasize that it is rather the quality of support derived from one's social network, which inures to the benefit of the individual (Adams & Dzokoto, 2003). A longitudinal study by Roche et. al. (2016) found a bidirectional association between family support and depressive symptoms. They indicate that a decline in support from family increased symptoms of depression and depressive symptoms also predicted family support.

This chapter examined, summarized and synthesized existing historic and contemporary qualitative, qualitative and mixed methods studies on mental health and

alcohol use in various settings. This study identified methodology and knowledge gaps in the literature. On knowledge, there is scant evidence on the influence (cross-sectional and long-term) of alcohol use on mental health in LMICs (Read & Doku, 2012; WHO, 2018; Liu et al., 2019). There has also been mixed findings on the protective association between moderate alcohol consumption and depression in developed contexts and unknown in developing contexts (Patel, 2007; Garcia- Esquinas et al., 2018; Gea et al., 2019). Further, the bidirectional relationship between alcohol use and mental health remains unclear (Boschloo et al., 2012; Sabramanaim et al., 2017; Bulloch et al., 2012; Danzo et al., 2017; Haynes et al., 2005). On methodology, many studies on the relationship have been cross-sectional which are limited in terms of assessing change and reverse causality (Guertler et al., 2020). A substantial number of studies have used either only the quantitative or qualitative approach of research to understand mental health problems. In addition, Ordinary Least Squares (OLS) and logistic regression models have often been used to assess non-normally distributed dependent variables which a high proportion of zeroes, for instance depression. This could lead to biased estimates (Zaninotto & Falaschetti, 2011; Xu et al., 2017; Guertler et al., 2020). This study filled the gap by providing knowledge on the levels and changes in alcohol consumption and depression in Ghana. It provides stronger evidence using population-level data, both cross-sectional and panel. On filling the methodology gap, this study utilizes improved analytical techniques that is, count models for non-normally distributed data. It also integrates both quantitative and qualitative approaches to offset each of their weakness when conducted alone and provide validity through being mutually corroborative.

2.9 Theoretical Considerations

Various theories and models that have been used to explain mental health and alcohol use guide this thesis. According to Ellinger & Yang (2011)**,** theories are important in research as they offer a rational explanation of the interrelationships among constructs,

definitions and propositions. In addition, they give explanations to prevailing conditions or predict future outcomes of a specific phenomenon (Ellinger & Yang, 2011; Bender, 2018). Distinguishably, models are belief systems that explain certain phenomena. Models are scientific when a shared set of assumptions based on scientific methods are used to explain the phenomenon and are unscientific when the culturally derived belief systems are used to explain the phenomenon (Bender, 2018). Scientific models have the unique ability of explaining dynamic processes and transformations in societies (Bender, 2018).

The Epidemiologic Transition Theory (Omran, 1971; 1983; 1998; 2005), Social Construction Theory and Biopsychosocial Model of Mental Health (Engel, 1977) have been used to explain mental health and alcohol use. The epidemiologic transition theory considers the change in lifestyle patterns leading to an increased prevalence of man-made degenerative diseases, which also serves as the leading cause of death. The Social Construction Theory of illness holds that the experience of illness and knowledge are created socially through interactions between individuals and groups in societies. The biopsychosocial model of mental health is a holistic model as it considers the biological, social and psychological determinants of mental health.

2.9.1 Epidemiologic Transition Theory

The epidemiologic transition theory emerged from landmark demographic studies by Thompson, Landry and Notestein, who posited theories on observed changes in fertility and mortality in populations (Thompson, 1929; Landry, 1987) and its association with socioeconomic changes (Notestein, 1945). Comparing the epidemiologic transition theory to the demographic transition theory, Omran described it as a more holistic theory, which explains complex changes in patterns of health and diseases influenced by interactions between socioeconomic changes and shifts in fertility and mortality trends (Omran, 1971, 1983, 1998, 2005). He studied trends in mortality patterns of developed and developing

countries including England, Japan, Sweden, Wales, Chile and Ceylon in Sri Lanka and indicated time period within which the stages of transition lasted.

Omran states five propositions to explain changing mortality, fertility patterns, life expectancy and leading causes of death. In the first proposition, he indicates that mortality trends are central to population dynamics. The second proposition states that in the long term, there are shifts from pandemics as leading causes of mortality to degenerative and man-made diseases. The third proposition indicated that more children and females survived during the transition leading to a decline in fertility rates. With the fourth proposition, he linked changes in health and disease patterns to demographic changes and socioeconomic development. With the fifth proposition, Omran delineates three variants of the epidemiologic transition: the Western, accelerated and contemporary or delayed model based on cross-cultural differences in the patterns, rate, predictors and effect of population change on mortality.

Again, Omran indicates three phases of the transition, that is, from pandemics to degenerative diseases, which societies would go through. The first phase, “age of pestilence and famine” describes a period of high and fluctuating mortality caused by epidemics, famine, wars, infectious diseases, pregnancy-related complications, and high fertility rates, which leads to slow population growth. There is low life expectancy varying between 20 and 40 years. He further revealed that the first phase lasted until 1875. During the second phase, “the age of receding pandemics” mortality rates decline steadily leading to a gradual decline in fertility. Life expectancy increases gradually from 30 to 50 years. Here, Omran attributes the decline in mortality and fertility rates to receding plagues, improvements in living standards, sanitation nutrition, and medical inventions such as contraception resulting from socioeconomic change. In addition, though communicable diseases remain the leading cause of mortality during this period, there are slight increases in prevalence of NCDs. He indicated that the second phase occurred between 1875 and 1930.

The third phase, “age of degenerative and man-made diseases” is marked by declining and low mortality. Life expectancy increases until it exceeds 50 years. Here, fertility is the driver of population growth. NCDs such as CVDs, cancers, diabetes, stroke stress-related illnesses such as mental illness and drug dependency (alcohol, tobacco and cocaine) become the leading causes of mortality (Omran, 1983; Rogers & Hackenberg, 1987). The second phase existed from 1930 to date. Other authors further developed the epidemiologic transition theory adding a fourth stage, “the age of delayed degenerative diseases” (Olshansky & Ault, 1986) and a second fourth stage “hybristic stage” (Rogers & Hackenberg, 1987). Omran harmonised them with his original three stages by adding a fourth stage “the age of declining cerebrovascular mortality, ageing, lifestyle modifications and resurgent diseases” and a fifth stage, “the emergence and re-emergence of infectious and parasitic diseases” (Omran, 1998). With respect to the fourth phase, life expectancy continues to rise to between 80 and 85 years. Mortality due to NCDs declines and is stable due to improved medical care and changes in lifestyle. The fifth phase is characterised by the advent of new diseases and old infectious and parasitic diseases such as diarrhoea, tuberculosis and plague among others.

Omran identified only three stages of transition in non-Western developing countries as opposed to the five stages of developed countries. Like the Western settings, non-Western countries have experienced the “age of pestilence and famine” and the “age of receding pandemics” transitions. The third stage is the “age of triple health burden”, characterised by prevailing health problems of the previous two transitions, a rising new set of health challenges, and healthcare system challenges. Health problems from the age of pestilence and famine such as communicable diseases, malnutrition among others continue to exist in the third stage. A rising new set of health challenges such as degenerative diseases, stress or depression, coupled with a poor health care system unable to provide adequate care for

communicable, CVDs and mental health disorders contribute to the triple health burden faced by developing countries (Omran, 1998).

This theory has been applied to other studies in various contexts. Sanders et. al. (2008), observe that developing countries' transition from infectious to degenerative diseases has begun but is not complete. In their review of multidisciplinary evidence on health and diseases in colonial, post-independence and post-structural adjustment in Accra, Agyei-Mensah and de-Graft Aikins (2010) report a double burden of diseases, that is, the coexistence of both infectious and chronic diseases as the leading causes of morbidity and mortality in Accra. In addition, the double burden is differentiated across socio-economic lines, that is, persons of low socioeconomic status have a higher morbidity and mortality burden of chronic and infectious diseases. Absent in Agyei-Mensah and de-Graft Aikins' (2010) study is the role of alcohol use and mental health in predicting morbidity and mortality.

The theory of epidemiologic transition would be applied in this thesis to explain changes in lifestyle factors and their influence on mental health at the population level.

2.9.2 Biopsychosocial Model of Health and Disease

George Engel in his seminal article in 1977 called for a new holistic model for the medical sciences to be able to better diagnose and treat mental disorders (Engel, 1977, 2012). The existing biomedical model attributed the cause of all illnesses to biological factors (Engel, 2012). That is, disease is a poor functioning of the physical, psychological and mental processes of an individual. Hence, it required that any deviation from normal behaviour be explained in the light of challenges with the brain (Engel, 2012). Again, the biomedical model viewed mental ill health as distinct from physical ill health (Wade & Halligan, 2017; Bolton & Gillet, 2019). Engel (1977, 2012) further argued that, the biomedical model lacked social (cultural), psychological and behavioural dimensions of

disease causation. Therefore, non-psychiatric disorders such as depression, stressful life conditions, and social deviance-related conditions, which may occur without any deficiency in brain functioning may be missed in biomedical diagnosis hence increasing the likelihood of non-treatment of these conditions. Laboratory results may also indicate the presence of a disorder, yet the individual may be feeling well. The biopsychosocial model, deemed as a holistic model advances the need to consider the biological, psychological and social factors that explain causes of mental disorders to be better able to diagnose and treat persons with mental disorders (Engel, 1977, 2012).

Since its postulation four decades ago, a wide range of research has validated the biopsychosocial model. Longitudinal epidemiologic studies have shown that many physical or mental illnesses have an early onset and develop over the life course of individuals (Kendler et al., 2002; Pirkola et al., 2005; Girgus & Nolen-Hoeksema, 2006). Some occur during childhood having been influenced by risk factors such as social factors including poverty and other social vulnerabilities, household or family factors such as neglect and abuse, and lifestyle factors such as alcohol use (Kendler et al., 2002; Pirkola et al., 2005; Girgus & Nolen-Hoeksema, 2006; Bolton & Gillet, 2019). In addition, other evidence have indicated genetic risk factors, chronic conditions for physical and mental disorders (Witkiewitz & Stauffer, 2014; Kohler et al., 2017). Despite the model being critiqued to be vague and lacking coherence, it has been used as has been applied in the fields of psychology, psychiatry social work as a framework to understand mental health (Bolton & Gillet, 2019). The biopsychosocial model would be used deductively in this thesis by testing the relationships suggested in reviewed studies during data analysis. Further, it would serve as a lens to understand how mental illness is constructed and experienced in various communities in Ghana

2.9.3 Social Construction Theory

For several decades, the traditional medical model was used to explain health and illness. It was criticised as being limited in its explanation because it only considered illness as being biologically caused. It described disease as a poor functioning of the physical, psychological and mental processes of an individual due to an injury, infection and genetics (Alonso, 2004). From this, it was positivistic in outlook in that it aimed at investigating the universal causes of illness using scientific measures (McCann, 2016). Subsequently, there was the danger of misdiagnosing illness as the medical model might ignore persons whose illness may not be biologically caused (Engel, 1977, 2012; McCann, 2016). The biopsychosocial model propounded by Engel (1977, 2012) was a more holistic model, which indicated that illness might be biologically, psychologically and socially caused.

Similar to the biopsychosocial model of health, the Social Construction theory of illness holds that, illness could be shaped by one's social and cultural context (Conrad & Barker, 2010; McCann, 2016). It is derived from symbolic interaction (Blumer, 1986) and phenomenology (Berger & Luckmann, 1966) perspectives both emerging from the interpretivist paradigms. First, it indicates that some illnesses have social and cultural meanings attached to them, which do not directly stem from the biological nature of the illness but it determines how persons in a society interact with those afflicted and which in turn influences their experience of the disease. Second, individuals' experience of illness is created by society through their interactions and experiences. It is constructed through the sufferers' understanding of their condition, how they construct their identity and live notwithstanding their illness. Third, medical knowledge about diseases and illness is socially developed by influential individuals and institutions that benefit from the outcomes of disease and illness medicalisation. Hence, medical knowledge is not objectively obtained (Conrad & Barker, 2010).

In applying the Social Construction theory to mental illness, McCann (2016) and Patel (1995, 2000) note that the existing universal diagnostic tools for categorising persons as mentally ill are positivistic and Western hence may exclude mentally ill persons who do not fit into certain diagnostic criteria particularly from non-Western contexts. The researcher calls for an emic perspective, which would provide culturally specific experiences, perceptions and feelings about mental illness since mental illness is socially and culturally determined, that is, it varies from one society to another.

Applying the Social Construction theory to alcohol use, Reinarman (1988) and Gladwell (2010) indicate that drinking and drunkenness are socially constructed. To explicate, as much as there could be biological (genetic) causation of drinking, it has more to do with the context-specific social and cultural meaning of alcohol use, how people learn to drink from society and conform to what they have learnt. Subsequently, there is the need for an emic study to understand the cultural meaning of alcohol consumption and how alcohol use is socially constructed. The Social Construction theory of alcohol use would be applied deductively in the qualitative analysis.

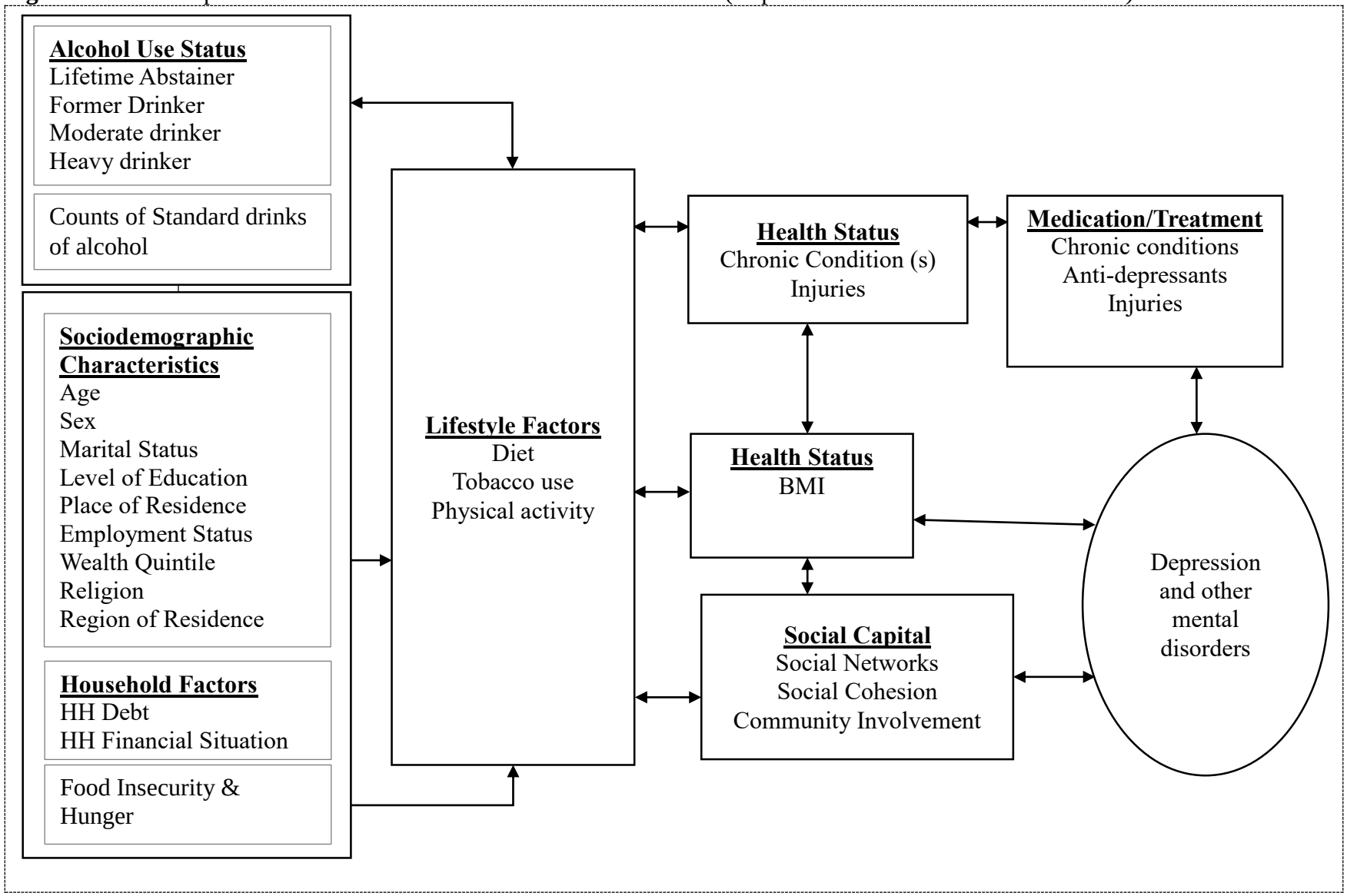
2.10 Conceptual Framework

The conceptual framework presented in Figure 2.3 integrates the various constructs and propositions from previous study findings, theories and models examined. This would serve as a guide to this thesis as it explains the relationship between alcohol use, various biological, psychological, social, economic factors, and mental health.

To explain the framework, alcohol use varies by sociodemographic and household factors. Together, they influence people's lifestyle behaviour, which in turn influence their chronic disease status, BMI, level of interaction in the community and social support. Depending on whether persons with chronic conditions or injuries take medication or receive treatment, they are likely to be depressed. In the reverse direction of the relationship,

where an individual is depressed, depending on whether the individual takes chronic disease medication or not would determine his/her health status, which could influences one's level of interaction with social networks as well as participation in various activities in the community. This could also influence other lifestyle behaviours in the individual, and finally determine his or her alcohol use status.

Figure 2.3 A Conceptual Framework of Alcohol Use and Mental Health (Depression and Other Mental Disorders)



Source: Adapted from Engel (1977, 2012)

2.11 Hypotheses

Based on the literature examined, three hypotheses are tested in this thesis.

I. Male heavy alcohol users are more likely to have poorer mental health compared to male lifetime abstainers.

II. Male moderate alcohol users are more likely to have better mental health compared to male lifetime abstainers.

III. There is a bidirectional longitudinal relationship between alcohol consumption and mental health. That is, over time, respondents who consume higher counts of standard drinks have poorer mental health compared to those who take lower counts of standard drinks and respondents with poorer mental health consume higher counts of standard drinks.

CHAPTER THREE

STUDY AREA AND METHODOLOGY

3.1 Introduction

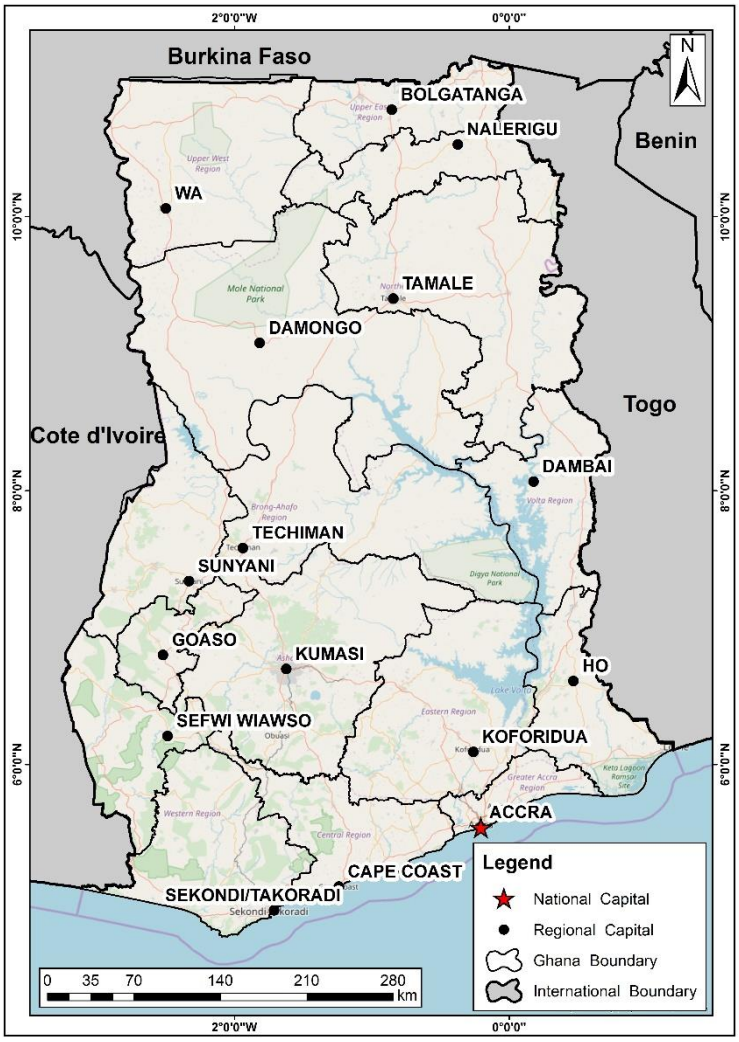
This chapter describes the study area and how the study was designed, conducted and analysed. In the first section, the demographic and socio-cultural context of the study area is presented. Thereafter, the philosophical underpinnings, which inform the study design, comprising of the sampling and data collection procedures, are discussed. The subsequent section reports the measures of variables considered in this study and the last section highlights the methods of analysis applied to the data as well as limitations of this study.

3.2 Study Area

Ghana is located along the Coast of the Gulf of Guinea in West Africa and is bounded by Cote D'ivoire, Burkina Faso and Togo to the West, North and East respectively. The country's population was 24,658,823 and there were 10 administrative regions in 2010 according to the 2010 Ghana Population and Housing Census (GSS, 2013b). The population averagely grew at an annual rate of 2.5% between 2000 and 2010 and has been estimated to double in 28 years' time (GSS, 2013b). Greater Accra and Northern Regions were the highest (1,235.8 persons per square kilometre) and least densely (35.2 persons per square kilometre) populated regions in Ghana. Since 1960, the Ghanaian population has been youthful with 50% being between the ages of 15-49 years in 2010 (GSS, 2013b). Significantly, the elderly population increased from 3% to 5% within the same period. Further, more than half (51%) of the population were female. About 51% live in urban areas and 74.1% of the population was literate. Seven out of ten persons, 1.7% and 5% of the population were affiliated to the Christian, Islamic and Traditional Religions respectively. Also, 41.5% of the population were employed (GSS, 2013b). The dependency ratio in 2010

was 76/100 population which was a decline from 90/100 population in 1960 (GSS, GHS & ICF, 2015). As at February 2019, Ghana had 16 administrative regions. Six new regions were created from subdividing the Volta, Brong Ahafo and Northern Regions. This study would however focus on the 10 regions that existed during the survey periods of the WHO Study for Global Adult Health and Ageing (SAGE), 2007 and 2014. They include Greater Accra, Central, Eastern, Western, Volta, Ashanti, Brong Ahafo, Northern, Upper East and Upper West Regions. Figure 3.1 shows the Map of the 10 administrative regions of Ghana as at December 2018.

Figure 3.1 A Map of Ghana: Administrative Boundaries (December 2018)



3.3 Research Paradigm

In the search for knowledge, researchers are often guided by assumptions of various research paradigms which in turn stipulate the nature of social reality (ontology), how knowledge is gained (epistemology) and the process of gaining knowledge (methodology) thereby influencing all stages of the research process (Brannen, 2005; Saunders et al., 2009; Rubin & Rubin, 2012; Kaushik & Walsh, 2019). There exists the qualitative (Interpretivist or Constructivist) and the quantitative (positivist) paradigms. The qualitative paradigm views the world as having numerous context-specific, subjective realities hence gains knowledge by interacting with study subjects to reveal their subjective understanding or experiences with regard to the social phenomenon being investigated (Saunders et al., 2009; Rubin & Rubin, 2012; Creswell & Clark, 2018). The quantitative paradigm or research approach views the world as having a single uniform reality, which researchers attempt to measure objectively in order to arrive at generalizable theories (Rubin & Rubin, 2012). The pragmatic paradigm posits that there are both uniform reality and numerous context-specific realities. Therefore they gain knowledge by practicality, that is the researcher utilises best fitting methodological approaches that address the research questions (Saunders et al., 2009; Creswell & Clark, 2018; Kaushik & Walsh, 2019).

3.4 Mixed Methods Design

There is an increased call for research on mental health and illness to mix qualitative and quantitative methods (Patel, 1995, 2000). Subsequently, guided by the pragmatic paradigm, the parallel mixed methods approach was used in analysing and interpreting the results. That is, secondary quantitative data, the WHO Study on Global Ageing and Adult Health (SAGE) longitudinal survey and secondary qualitative data from the Social Representations of Stroke and Stroke Care in Ghana Study (Sanuade, 2018) were obtained and analysed separately. The quantitative descriptive, cross-sectional and panel results and qualitative findings were compared, related and interpreted. The mixed methods design was

adopted first because the research questions of this study required the use of both quantitative and qualitative methods. Secondly, the triangulation of the quantitative and qualitative methods provided greater validity with being mutually corroborative. Thirdly, combining both methods helped to offset the weakness of either one (Driscoll, Appiah-Yeboah, Salib, & Rupert, 2007; Bryman, 2012). Finally, it helped to produce a comprehensive account of alcohol use and mental health by exploring community level understandings of alcohol use and mental health and investigate population-level trends in addition to predicting mental health over time.

3.4.1 Qualitative Study Design and Data

This qualitative approach is a secondary analysis of data from the primary study *"Social Representations of Stroke and Stroke Care in Ghana Study"*, a cross-sectional qualitative study conducted between October and November 2017 by Olutobi Sanuade. The study had ethical approval from the Research Ethics Committee (REC) of the University College London (REC number-11371/001) and from Ghana Health Service Ethics Review Committee (GHS-ERC number-007/09/17).

Participants were residents from five communities in Ghana selected using the purposive sampling technique. The communities included Chanshegu, Tafo, Gyegyeano, Agorve, and Ga Mashie in Tamale, Kumasi, Cape Coast, Keta and Greater Accra respectively. These communities located in five regions of Ghana were selected to capture the socio-cultural distinctions or similarities in perspectives on chronic conditions among five major ethnic groups in Ghana. The location of the study communities are shown on the map in Figure 3.2. Data were collected using focus group discussions (FGDs). In each of the study communities, six FGDs were conducted and the groups were segmented by age and sex to facilitate discussions. The discussion groups comprised of female older adults (60-80 years), female younger adults (36-59 years) and female youths (20-35 years), male older adults (60-80 years), male younger adults (36-59 years) and male youths (20-35 years).

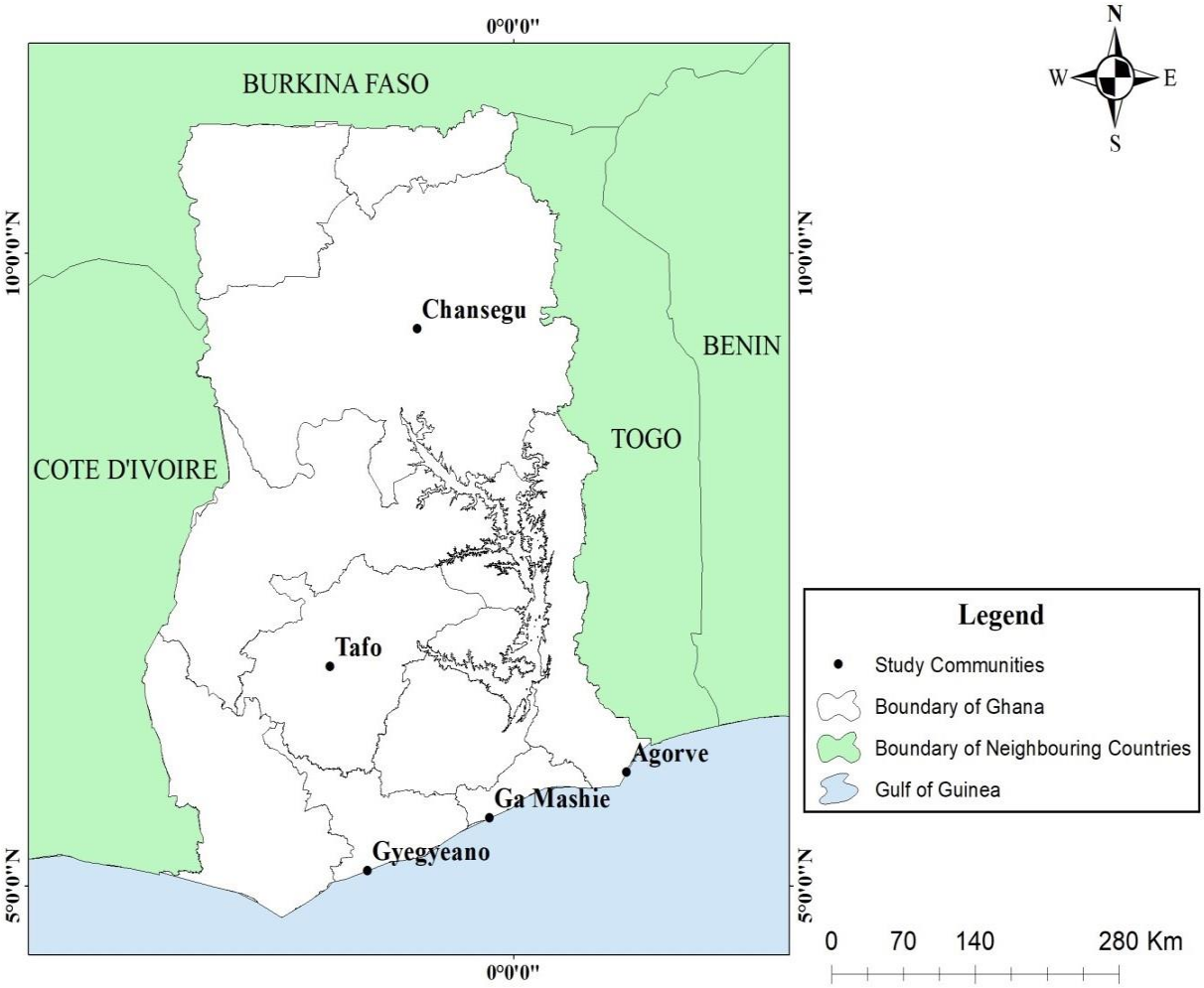
In all, 30 FGDs were conducted (Sanuade, 2018). Participants' profiles are presented in Table 7.1. The group discussions had between six and ten participants. Studies have asserted that the sample size of between six and ten is adequate to facilitate ease in moderation, and extensive discussion of the topics to reach the desired depth and scope of the discussions (Nyumba et al., 2018; Sanuade, 2018). Participants gave informed consent after the objectives of the study were explained to them. The interviews were conducted in Ga, Twi, Ewe and Dagomba. With the permission of respondents, the interviews were audio taped and transferred to computers to be transcribed.

During the FGDs, respondents discussed issues pertaining to knowledge on health and illness, chronic diseases, causes and expected outcomes of alcohol consumption and mental health. Box 3.1 depicts some areas of the FGDs relevant to this study.

Box 3.1 Some Areas of Focus Group Discussions

1. General life history
2. Health and illness (conceptualisation of health and illness including mental health)
3. Chronic diseases-mental disorders (definition, knowledge-types and causes, lived experience)
4. Social history of chronic diseases-mental disorders (aetiology, severity, duration, outcomes, treatment)
5. Alcohol use (sociocultural context of alcohol use, causes and expected outcomes)

Figure 3.2 The Map of Ghana Showing the Five Study Communities



Adopted from "Social Representations of Stroke and Stroke Care in Ghana Study", by Sanuade (2018), Wellcome Open Research. Retrieved July 10, 2019, from https://wellcomeopenresearch.org/articles/3-87

3.4.1.1 Qualitative Data Analysis

While several advantages of re-use of primary qualitative data have been outlined, there exists ethical and epistemological challenges which may influence its interpretation. The ethical challenge of sharing the identity of FGD participants has been noted. In view of this, prior to, and during the secondary analysis of the qualitative data, efforts were made to increase rigor and transparency in this study. First, the Principal Investigator (PI) of the parent qualitative study de-identified the FGD transcripts to prevent sharing of information of study participants. In addition, the PI was also involved in the reviewing of codes and results of the thematic analysis. Further, to ensure credibility and confirmability, techniques and paths that led to analysis, interpretation of data and conclusion such as the following

were carried out: thick description and detailed depiction of the experiences, and emotions, verbatim narratives of individuals and group accounts of community level perceptions and ideas.

The qualitative data in the form of interview transcripts were imported into ATLAS.ti 7 software for coding and analysis. The qualitative data were analysed using thematic network analysis in line with Attride-Stirling's (2001) and Braun and Clarke's (2006) procedure. The first stage of analysis involved reading and re-reading all the transcripts to identify initial ideas and generate codes from participants' discussions on alcohol use and mental health. A combination of deductive and inductive coding was employed during analysis. The deductive codes were derived from previous studies reviewed (Patel, 1995; Patel & Stein, 2015; Opare-Henaku & Utsey, 2017) and the inductive codes emerged from the frequent themes inherent in the data. The second stage involved grouping the various codes into themes (global, organising and basic) and identifying the relationship between the different levels of themes as well as associated respondent quotes. The process of interpretation of data was guided by the Social Construction theory to highlight the socio-cultural understandings of alcohol use and mental health in the various study settings.

3.4.2 Quantitative Study Design and Data

The WHO's Study on Global Ageing and Adult Health (SAGE) Survey is a longitudinal, multi-country study conducted in Ghana, South Africa, India, China, Mexico, and Russia (Kowal et al., 2012; Naidoo, 2012; Biritwum et al., 2013). It aims to collect evidence on ageing and related health variables in LMICs given the increasing proportion of aged persons in the past few decades (Kowal et al., 2012). In Ghana, SAGE Wave 1 was conducted between 2007 and 2008 and SAGE Wave 2 from 2014 to 2015. Wave 0 (2003-2004) was designed to represent the general population while Waves 1 and 2 oversampled

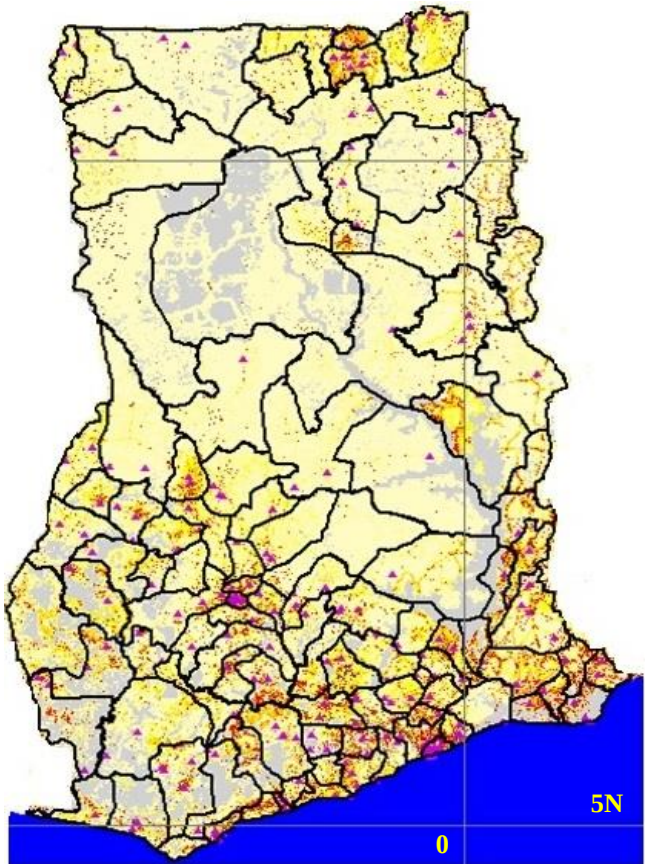
the elderly population (persons 50 years and above). Losses to follow-up in Waves 1 and 2 were replaced to obtain the targeted sample size.

The multistage cluster sampling procedure was used to sample respondents in both waves. At the first stage of sampling for Wave 1, the primary sampling units (PSUs), which were the enumeration areas (EAs), stratified by administrative region (Greater Accra, Central, Ashanti, Brong Ahafo, Eastern, Northern, Upper East, Upper West, Volta and Western Region) and place of residence (rural and urban areas) yielded 20 groupings (strata).

At the second stage, the sampling frame of the 2000 Population and Housing Census (PHC) Enumeration Areas (EA) was updated through household listing and respondents available for interview were selected from 250 out of the 300 EAs used in Wave 0. EAs without households with persons 50 years and above were not selected due to the intention of oversampling persons aged 50 years and above. A total of 24 households were randomly selected from each EA using the systematic sampling design. Four households with persons aged 18-49 and 20 households with persons aged 50 years and above and individuals 50 years and above were selected in each EA. A total sample size of 5269 households and 5571 individuals were selected (Naidoo, 2012; Biritwum et al., 2013).

In 2014 and 2015, respondents followed up in Wave 1 were interviewed in Wave 2. The household listing information that had been updated was used to sample 250 EAs. Out of these EASs, 24 households were randomly selected using the systematic sampling design at the second stage of sampling. This comprised of four households with persons aged 18-49 and 20 households with persons aged 50 years and above. A total sample size of 5117 households and 4735 individuals were selected. Figure 3.3 shows the study area, administrative boundaries and the distribution of the clusters.

Figure 3.3 Study Area, Administrative Boundaries and Sampling Distribution



Source: SAGE Ghana (2009)

Pertaining to data collection, in Wave 1, household and individual questionnaires were administered face-to-face in the homes of respondents using paper-based questionnaires (Naidoo, 2012). In Wave 2, the computer-assisted personal interviewing (CAPI) was used. Interviews were carried out in Akan and Ga, which are local languages and in English where the respondent spoke English.

Show cards were provided as appendices to the interviews to aid respondents provide more accurate responses hence reduce measurement error. The Alcohol and Tobacco show cards illustrated a list of standard alcohol drinks and tobacco products to aid respondents more accurately determine the type and the average number or quantity alcohol and tobacco used (WHO, 2006).

The Nutrition show card served as a guide to show examples of types and servings of typical fruits and vegetables. Physical activity show card was shown to provide examples

of different intensity physical activities. To find out a respondent's risk for some health conditions, anthropometric measurements such as height and weight were also taken using the stadiometer and weighing scale. Height was recorded to the nearest 0.1centimetres (cm) while weight to the nearest 0.1 kilogramme (kg). A Boso Medistar Wrist Blood pressure monitor Model S was used to take blood pressure rates. This was done to assess respondents' blood pressure level, which is a measure of their hypertension or stroke status.

3.4.2.1 Measures

From the SAGE instrument[3], the variables measured in this study from Wave 1 and 2 consisted of mental health (depression), alcohol use, sociodemographic and economic characteristics, other lifestyle factors, health-related factors, medication use, social capital, and stressful life events. Previous studies and theories reviewed in Chapter two informed the choice of variables for the models in this research. Variables used for this study were measured in a consistent and reliable manner. For most of these measures, new variables were created separately for each wave from the existing ones through the development of indices, scales, conditional and arithmetic changes. Indices were developed based on communality of individual variables, conditional changes to the variables were done based on a mixture of criteria such as sample size and theories worked with in this present study. Arithmetic computations and scales were developed based on recommended standards of measure. All these aimed to facilitate robust analysis. The composition of the measures and codes allocated to them are described further in the subsequent sections.

3.4.2.1.1 Depression

Mental health or depression as the outcome variable was measured using the 9-item DSM-IV criteria for clinical evaluation of Major Depressive Episode (APA, 2000). Respondents who responded affirmatively to symptoms (1) and or (2) together with any

[3] The 80 paged WHO SAGE Wave 1 questionnaire can be assessed from: https://www.who.int/healthinfo/systems/GenericIndividualQ.pdf

other simultaneously occurring symptoms were noted to have depressive symptoms. The simultaneously occurring symptoms (3) to (9) include appetite and weight changes, sleep difficulty or disturbance, agitated movements and behaviour, decreased energy, difficulty in thinking, concentration or making decisions and morbid or suicidal thoughts. Respondents who responded negative to (1) and (2) were considered as having zero counts of symptoms of depression. Below are the measures of the depression that formed the scale.

1) being in a depressed mood nearly every day for at least 2 weeks in the past 12 months and or
2) experienced a loss of interest or pleasure in almost all activities (Anhedonia) or decreased interest in sex nearly every day for at least 2 weeks in the past 12 months

Both symptoms above could be either self-reported or noticeably observed by others.

3) Changes in appetite nearly every day or significant weight loss or gain was assessed with:

   'During this period, did you lose your appetite?'
4) Insomnia or hypersomnia nearly every day was assessed with

   'Did you notice any problems falling asleep?' or 'Did you notice any problems waking up too early?'
5) Psychomotor retardation or agitation was assessed by asking the questions

   'Did you notice any slowing down in your moving around?' or 'During this period did you feel anxious and worried most days? Or 'During this period were you restless or jittery nearly every day that you paced up and down and couldn't sit still?
6) Loss of energy or fatigue was assessed with

   'During the last 12 months, have you had a period lasting several days when you have been feeling your energy decreased or that you are tired all the time?'
7) Feeling of worthlessness or excessive guilt nearly every day was asked with

'During this period, did you feel negative about yourself or like you had lost confidence?' or 'Did you frequently feel hopeless - that there was no way to improve things?'

8) Diminished ability to think or concentrate or indecisiveness was asked with

'Did you notice any slowing down in your thinking?' or 'during this period, did you have any difficulties concentrating; for example, listening to others, working, watching TV, listening to the radio?'

9) Recurrent thoughts of suicide or death ideation was assessed with

'Did you think of death, or wish you were dead? Or 'During this period, did you ever try to end your life?'

Some individual symptoms were assessed with more than one question. In this regard, for such disaggregated symptoms, one was considered to have a depressive symptom if at least one of the disaggregated symptoms was reported. For instance, with (5) psychomotor retardation (agitation) a report of slowdown in movement rather than feeling restless or jittery would be counted. The Cronbach's alpha values for both Waves 1 and 2 depression measures were 0.77 and 0.71 respectively, which are considered as acceptable in social science research. Subsequently, a composite count/discrete variable was computed by summing the items for each wave.

Higher counts of symptoms of depression indicated high levels of depression or poor mental health for that individual and a lower count, indicated low depression levels. The dependent variable was left as a count variable first due to the objectives of the study. Secondly, because dichotomizing would lead to a loss of information and thirdly, treating it as a continuous variable would produce biased estimates as the variable was not normally distributed.

3.4.2.1.2 Alcohol Consumption

Globally, different bottles, cans, casks or glasses of beers, liquor, and wine have varied amounts of alcohol hence difficult to compare across the types of alcoholic beverages the actual quantity of alcohol consumed. The 'standard drink' as a measure determines the actual content of the average daily drink consumed and makes different sizes and types of alcoholic drinks comparable. It is calculated as the volume of the container or amount of drinks (litres) multiplied by content of alcohol in a drink (% alc. vol.) and the density of ethanol at room temperature (0.789) (Agency, 2016). There are different thresholds for what constitutes a standard drink among countries (Martinez, 2012; Wise, 2018). WHO SAGE survey considered country-specific measure of 8-13g. of ethanol as a standard drink which is equivalent to 1 standard bottle of regular beer (285ml), 1 single measure of spirits (30ml), 1 glass of wine (120ml) and 1 measure of aperitif (60ml). Various studies have specified different standards of drinks for men and women due to differences in physiology which make women predisposed to health problems with a lower level of alcohol use (Martinez, 2012; Mancinelli, 2013). These include differences in body mass index (BMI) and amount of water in body, difference in hormone activity pattern, lower ethanol metabolism in the stomach of women compared to men (Center for Substance Abuse Treatment, 2009; Mancinelli, 2013; Aristotelis et al., 2015).

All respondents reported on whether they have ever consumed an alcoholic drink in their lifetime, current users responded to questions on consumption of alcohol in the last 30 days, and the number of standard drinks consumed in the past week. Two alcohol use variables, previous week alcohol consumption which was a discrete (count) variable and alcohol use status, a categorical variable, were computed from the questions. For the first alcohol use variable, the responses on the number of standard drinks used in the previous week were summed to create a previous week alcohol use. This was to help assess recent alcohol use of respondents. For the second alcohol use variable, utilizing summed responses

on the number of standard drinks used in the previous week, together with responses on lifetime consumption of alcohol, alcohol use status was measured by categorising alcohol users into lifetime abstainers, former drinkers, moderate drinkers and heavy drinkers. Lifetime abstainers consisted of persons who had never consumed alcohol in their lifetime. Former drinkers had ever taken alcohol in their lifetime however not in the last 12 months.

In the absence of an agreed international guideline on standards of alcohol consumption, moderate and heavy drinkers were categorised using daily and weekly recommended units of consumption stipulated by the U.S. Department of Health and Human Services and U.S. Department of Agriculture which were derived from population level epidemiological studies (Agriculture, 2015). Unlike the United Kingdom's low risk drinking guideline, the US alcohol consumption guidelines specifies different thresholds for men and women in recognition of the physiological differences in men and women which makes women vulnerable to dire consequences. Ministry of Health's Dietary and Physical Activity Guidelines for Ghana, adapted caloric counts of various alcoholic beverages from the 2005 American Dietary Guidelines however did not indicate upper or lower-limit thresholds of these counts (MOH, 2010). In view of the differential influence of alcohol consumption on men and women, this study specified different thresholds for men and women using the recommended lower and upper limit thresholds as indicated by the 2015 US alcohol consumption guidelines (Agriculture, 2015).

Moderate drinkers comprised of respondents who reported having taken alcohol within 30 days and 7 days prior to the date of interview, with women and men having up to 7 and 14 standard drinks correspondingly. Heavy drinkers consisted of persons who had also taken alcohol 30 days and 7 days prior to the interview with female heavy drinkers reporting to have consumed above 7 standard drinks and men having above 14 standard drinks. These four categories of responses for the alcohol use status variable were coded as lifetime abstainer=0, former drinker=1, moderate drinker=2 and heavy drinker=3. Two

different variables of alcohol consumption would help achieve the objectives of this study. First, alcohol use being considered as a categorical variable would help to examine trends and changes in alcohol use status among categories of alcohol users. Second, treatment of alcohol use as a count variable, that is, past week's count of standard alcoholic drinks was to help assess trends and changes in number of standard alcohol drinks consumed among current users of alcohol as well as investigate the bidirectional relationship between alcohol and mental health.

3.4.2.1.3 Control Variables

Variables, which have been found in preliminary bivariate analysis of this study and in earlier studies to influence the relationship between alcohol use and depression, were statistically adjusted for in the multivariate models. They included sociodemographic characteristics, lifestyle factors such as diet, physical activity, tobacco use and Body Mass Index (BMI), other health-related factors, and social capital.

3.4.2.1.3.1 Sociodemographic Characteristics

Sociodemographic characteristics of respondents which served as individual level factors were measured as age, sex, highest level of education, religious affiliation, marital status, place of residence. A further description of the variables and their codes are displayed in Table 3.1

Table 3.2 Variable Description: Sociodemographic Characteristics in Wave 1 and 2

Variable Category	Variable Name	Variable Type	Definition/ Code
Socio-demographic Background	Age Groups	Categorical	0= 18-49 1=50-80+
	Gender	Categorical	0=Male 1=Female
	Marital Status	Categorical	0=Currently Married 1=Currently Married
	Currently working (Employment status)	Categorical	0=No 1=Yes
	Religious Affiliation	Categorical	0=None 1=Christian 2=Islam 3=Traditional Religion 4=Other
	Level of Education	Categorical	0=None 1=Primary 2=Secondary/higher
	Place of Residence	Categorical	0=Rural 1=Urban
	Region of Residence	Categorical	0=Ashanti 1=Brong Ahafo 2=Central Region 3=Eastern Region 4=Greater Accra Region 5=Northern Region 6=Upper West 7=Upper East 8=Volta Region 9=Western Region

3.4.2.1.3.2 Household Debt

This study controlled for household debt as a measure of household socioeconomic status. From the questionnaire, household heads were asked if their households or any member of the households had current debt or unpaid loans. Responses were recoded as 0=no and 1=yes.

3.4.2.1.3.3 Household Financial Situation

A second measure of household economic status controlled for was household financial situation. Household heads reported on whether their household financial situation was good, moderate or bad. The good and moderate financial situation variable categories were combined due to small sample size. Responses were coded as 0=bad and 1=good.

3.4.2.1.3.4 Household Permanent Income Quintile

The household permanent income quintile, third measure of long-term household socioeconomic status of respondents served as a control variable in this study. Non-productive assets such as television, radio, mobile phone, refrigerator, motorcycle and car/truck and utilities comprising of sanitary facilities, electricity, flooring, walls and roofing materials of dwelling owned by individuals in the households or the households were used to calculate their household permanent wealth quintile. Prior to creating the household permanent income measure, first, the 13 items were scored in the same direction so that a low score on the measures would have the same meaning and vice versa. Second, with a combination of binary and Likert scale responses, the latter were recoded as binary categorical variables with codes of "0" and "1" for uniformity before performing Cronbach's alpha tests and dimension reduction. Cronbach's alpha tests were conducted to assess the internal reliability of the items for the indicator. The alpha values showed an acceptable internal consistency with alpha values of 0.75 for Wave 1 and 0.74 for Wave 2.

A principal component analysis with orthogonal rotation (varimax) was run to create a wealth indicator comparable to Hjelm et al. (2017). An exploratory bivariate analysis disaggregating assets by place of residence showed that assets varied for persons living in the rural and urban areas in both waves hence, scores were separately generated within each setting to account for the differences in assets owned. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy which was used to find out if the sample size of the overall data and individual variables was large enough to produce reliable results yielded values of 0.79 and 0.80 for Waves 1 and 2 correspondingly, above 0.50 acceptable limit. Five and four factors had eigenvalues of over 1 for Waves 1 and 2 explaining 63% and 52% of variance among the variables respectively. The first components were retained as they accounted for the largest proportion of variance. The scores for the wealth index were

ranked and quintiles were created. They were coded 0=poorest, 1=poor, 2=middle, 3=rich, 4=richest.

3.4.2.1.3.5 Consumption of Fruits and Vegetables

Fruit and vegetable intake measured dietary practices. Respondents were asked how many servings of fruit and vegetables they ate on a typical day. A variable was computed with responses being grouped into healthy diet when respondents indicated their servings of fruit and vegetables to be more than 5 servings per day and unhealthy diets when they reported less than 5 servings of fruit and vegetables per day according to WHO recommendations (WHO, 2013). Healthy and unhealthy diet were associated with the code 1 and 0 correspondingly.

3.4.2.1.3.6 Physical Activity

Questions on physical activity in SAGE were derived from the Global Physical Activity Questionnaire (GPAQ) Version 2 (WHO, 2006). Computation of the physical activity indicator was based on three domains: work-related, travel-related and recreation-related physical activity, which consist of 10 items. Units of measurement for these activities were in days per week and hours per day which when combined yielded the Total Physical Activity Metabolic Equivalent Tasks (MET), measured in minutes per week. Table 3.2 shows the domains, questions and codes used in computing the indictor.

Table 3.3 Domains and Measures of Physical Activity Participation

DOMAIN	QUESTION (RESPONSE)	CODE
Work-related Activity	In a typical week, on how many days do you do *vigorous-intensity activities* as part of your work? (Number of days)	P2
	How much time do you spend doing *vigorous-intensity activities* at work on a typical day? (hours: minutes)	P3
	In a typical week, on how many days do you do *moderate-intensity* activities as part of your work? (Number of days)	P5
	How much time do you spend doing *moderate intensity* activities at work on a typical day? (hours: minutes)	P6
Transport-related Activity	In a typical week, on how many days do you walk or bicycle for at least 10 minutes continuously to get to and from places? (days)	P8
	How much time would you spend walking or bicycling for travel on a typical day? (hours: minutes)	P9
Recreation-related Activity	In a typical week, on how many days do you do *vigorous intensity* sports, fitness or recreational (leisure) activities? (Number of days)	P11
	How much time do you spend doing *vigorous intensity* sports, fitness or recreational activities on a typical day? (hours: minutes)	P12
	In a typical week, on how many days do you do *moderate-intensity* sports, fitness or recreational (leisure) activities? (Number of days)	P14
	How much time do you spend doing moderate intensity sports, fitness or recreational (leisure) activities on a typical day? (hours: minutes)	P15

Source: WHO, 2006

The formula below as indicated in the GPAQ analysis guide was used in the computation:

$$\text{Total Physical Activity MET-minutes/week} = [(P2 \times P3 \times 8) + (P5 \times P6 \times 4) + (P8 \times P9 \times 4) + (P11 \times P12 \times 8) + (P14 \times P15 \times 4)]$$

Where:

8 and 4 are constants representing metabolic equivalents (METS) of vigorous and moderate physical activity levels obtained from lab or field experiments measuring the energy cost of a number of activities (Ainsworth et al., 2011).

In line with WHO recommendations on physical activity for health, respondents were grouped as being "inactive" when their physical activity level was less than 600 minutes, and "physically active" when their physical activity level was equal to or greater

than 600 minutes (WHO, 2005; WHO, 2010). The codes "0" and "1" were assigned respectively.

3.4.2.1.3.7 Tobacco use

Questions on tobacco use in the SAGE data were based on the WHO recommended guidelines for monitoring tobacco use (WHO, 2006). Respondents were asked if they currently use any tobacco product such as pipes, cigars, cigarettes, chewing tobacco or snuff for which they indicated either 'yes' or 'no'. These were grouped and coded as not currently smoking=0 and currently smoking=1.

3.4.2.1.3.8 Body Mass Index (BMI)

Anthropometric measures of respondents were taken and the BMI was computed as weight (kg) divided by the square of height (m) (kg/m^2). According to WHO categorisations for BMI, respondents were grouped into underweight, individuals with BMI <18.5 kg/m^2, normal weight (18.5-24.9 kg/m^2), Overweight (25-29.9 kg/m^2), and Obese (≥30 kg/m^2). Codes associated with these categories were underweight=0, normal weight=1, overweight=2, and obese=3.

3.4.2.1.3.9 Injury

Bodily injury related to being involved in road traffic accidents and accidents as a result of fall, burn, poisoning, submersion in water, by firearm, sharp weapon or an act of violence from another person in the home, school or workplace were enquired of respondents. This was a dichotomous variable with no=0 and yes=1 response codes.

3.4.2.1.3.10 Co-morbidity Status

The number of chronic conditions of respondents were measured. A composite variable was obtained by summing responses on self-reported diagnosis by a healthcare professional or a doctor of hypertension, stroke, arthritis, angina, asthma chronic lung disease. Individuals responding 'no' to all questions on chronic conditions were given the

code ‘0’ representing no chronic condition. Higher numbers indicated more chronic conditions and lower numbers depicted fewer chronic conditions.

3.4.2.1.3.11 Medication or Treatment

Respondents who indicated being diagnosed by a doctor of chronic conditions, depression or suffered injuries within the last 12 months were further asked if they were taking medications or receiving treatments for them in the past 2 weeks or one year. The response ‘yes’ was associated with code ‘1’ and ‘no’ was associated with code ‘0’.

3.4.2.1.3.12 Social Capital and Social Cohesion (Psychosocial factor)

Various dimensions of social capital, structural and cognitive social capital, as well as social cohesion were used in this research similar to other studies (Grootaert et al., 2004; Botterman, 2015). Table 3.3 shows the 18 items of social capital utilised. Structural capital was measured by questions on participation in group meetings, community groups, civic groups, neighbourhood, religious or social activities among others. Items on trust of neighbours and others measured cognitive social capital. Social cohesion was measured by the extent of fear of crime in one’s neighbourhood as the level of order in a society is ensured by how close knit a society is.

Prior to creating the social capital measure, the 18 items were scored in the same direction so that a low score on the measures would have the same meaning and vice versa. Subsequently, the Cronbach’s alpha tests were used to assess the internal reliability of the measure. Together, they showed an acceptable and strong internal consistency with a Cronbach’s alpha values for Wave 1 being 0.77 and 0.83 for Wave 2. Thereafter, composite variable was created by summing the items. Since the scale was made up of different items or came from different distributions, the composite variable was standardised to a 100-point scale to facilitate a comparison of the scores and interpretation. Below is the formula for the linear transformation of the scores for each Wave. 0 indicated no social capital and 100 indicated highest social capital.

$$Z\mathrm{t}^{n} = \frac{Z\mathrm{t} - \min(Z\mathrm{t})}{\max(Z\mathrm{t}) - \min(Z\mathrm{t})} x\ 100$$

Where:

Z_t^n = Lineally transformed variable

Z_t =Variable to be transformed

Min(Z_t)=Minimum value of the variable to be transformed (Z) at Wave t

Max(Z_t)=Maximum value of variable to be transformed (Z) at Wave t

Table 3.4 Measures of the Dimensions of Social Capital and Social Cohesion

Dimension	Question
Structural	How often in the last 12 months, have you… • attended any public meeting in which there was discussion of local or school affairs? • met personally with someone you consider to be a community leader? • attended any group, club, society, union or organizational meeting? • worked with other people in your neighbourhood to fix or improve something? • … had friends over to your home? • been in the home of someone who lives in a different neighbourhood than you do or had them in your home? • socialized with co-workers outside of work? • attended religious services (not including weddings/funerals)? • gotten out of the house/your dwelling to attend social meetings, activities, programs or events or to visit friends or relatives? • Would you like to go out more often or are you satisfied with how much you get out of the house?
Cognitive	• Generally speaking, would you say that most people can be trusted or that you can't be too careful in dealing with people? • Do you have someone you can trust and confide in? • First, think about people in your neighbourhood. Generally speaking, would you say that you can trust them? • Now, think about people whom you work with. Generally speaking, would you say that you can trust them ? • And how about strangers? Generally speaking, would you say that you can trust them?
Social Cohesion	• In general, how safe from crime and violence do you feel when you are alone at home? • How safe do you feel when walking down your street alone after dark? • In the last 12 months, have you or anyone in your household been the victim of a violent crime, such as assault or mugging?

3.4.2.1.3.13 Self-Reported Health

From the questionnaire, participants reported on various dimensions of health. This comprised of 14 items of problems with mobility, pain and discomfort, cognition, interpersonal activities, sleep, energy, affect and vision. Chronbach's alpha tests were conducted with alpha values for Waves 1 and 2 being 0.88 and 0.92 respectively, indicating a strong internal consistency. The scores were transformed lineally to a 100-point scale with 0 representing best self-reported health and 100 representing worst self-reported health.

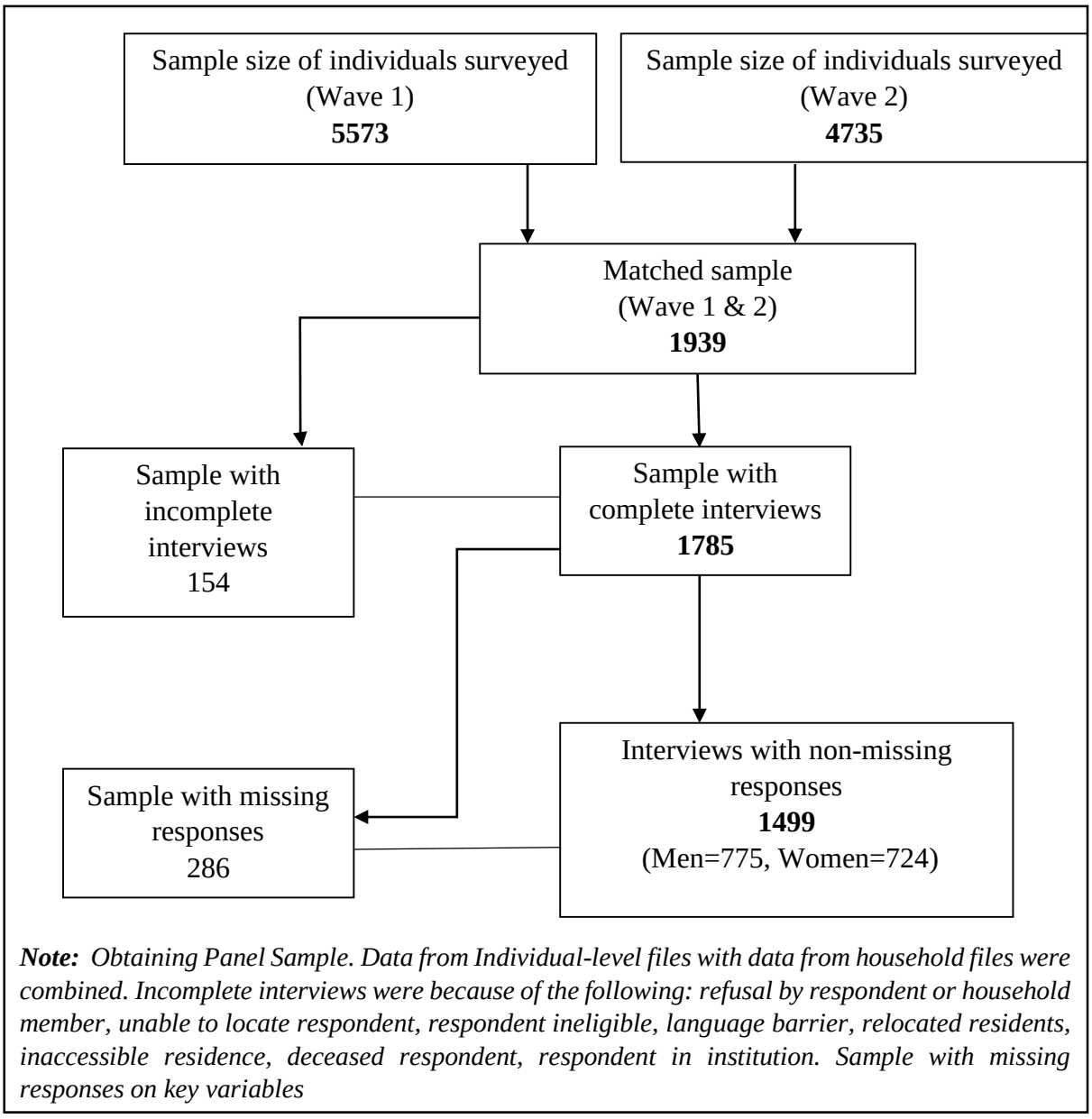
3.4.2.1.3.14 Food Insecurity and Hunger

A measure of deprivation as a result of lack of financial resources for food (food security), which is a source of stress was measured by 'in the last 12 months, were you ever hungry, but didn't eat because you couldn't afford enough food?' Responses were recoded as 0= never, 1=some months and 2=every month.

3.4.2.2 Cross-sectional and Panel Data Preparation

The initial longitudinal design of the WHO SAGE survey was to follow up on respondents and replace household respondents who had died, migrated, could not be located among other reasons. As a secondary analysis of quantitative data, this study utilised two waves of panel data of a subsample of respondents followed up in the Wave 1 (2007-2008) and Wave 2 (2014-2015) with repeated measurements of the outcome, independent and control variables from the WHO SAGE survey. The subsample was a relatively younger panel compared to the total sample with an average age of 48.2 in Wave 1. The final analytical sample comprised of 1499 individuals, and 2998 observations. Figure 3.4 presents a flow diagram of the process of obtaining the panel sample used for analysis in this study.

Figure 3.4 Flow Diagram of the Selection Process of the Analytical Sample



Note: *Obtaining Panel Sample. Data from Individual-level files with data from household files were combined. Incomplete interviews were because of the following: refusal by respondent or household member, unable to locate respondent, respondent ineligible, language barrier, relocated residents, inaccessible residence, deceased respondent, respondent in institution. Sample with missing responses on key variables*

In all, there were three datasets analysed, two cross-sectional datasets and one panel data. Analysis was carried out separately on the two single cross-sectional datasets. This was to examine the cross-sectional effect of alcohol use and mental health in Ghana. Prior to analysis, the cross-sectional data were screened for missing cases, inconsistent responses and outliers and diagnostic tests were carried out. The essence of screening of data and diagnostic tests were to help correctly specify models which were unbiased, that would produce sample estimates reflective of the general population estimates (Hans-Jürgen et al., 2013).

For the panel data, unique identification numbers (ids) of respondents in Wave 1 and 2 were merged to obtain their responses from both waves into a single dataset. Thereafter, the merged data was reshaped and declared a panel data. Here, the balanced panel as multidimensional data were to facilitate observation of between individual and within individual variation in variables across time, examine the trajectory of change and test causal hypothesis in alcohol use and mental health adjusting for both time variant and invariant factors. The subsequent sections further discuss the screening process and diagnostic tests.

3.4.2.2.1 Data Screening

Of prime concern was the issue of non-response and attrition, therefore the need to screen the data. First, the data were screened according to statistical recommendations by inspecting for missing data, outliers and consistent responses to ensure data were valid, reliable and could be used to test causal theory (Langkamp et al., 2010; Hair et al., 2014). Screening for missing data and outliers are particularly important as they affect power and precision, causing a biased estimate of the analysis (Langkamp et al., 2010; Hair et al., 2014).

Exploratory analysis of frequencies of missing data was conducted. Afterwards, Little's missing completely at random (MCAR) test was run to further assess the pattern of missing data and to determine whether the missing values were missing at random. In Wave 1 the MCAR test was not statistically significant (p=0.5665), meaning variables did not have a concentration of missing values. In Wave 2, however, the MCAR test was statistically significant (p=0.000). Additional analysis revealed the BMI variable had a concentration of missing values, hence accounting for the statistically significant MCAR test. Subsequently, it was excluded from the regression models as a remedy.

3.4.2.3 Cross-sectional and Panel Data Diagnostic Tests

To assess the distribution of the outcome variable, depression was initially considered as a continuous variable and bivariate and multivariate diagnostic tests for the

cross-sectional and panel data were carried out according to statistical standards[4] (Pevalin & Robson, 2009; Langkamp et al., 2010; Hair et al., 2014; Stockemer, 2019). This was important as it would serve as a basis to justify the consideration of the subsequent treatment of the outcome variable as count. Further, this would ensure that results from the bivariate and multivariate analyses were valid and accurate.

3.4.2.3.1 Cross-sectional Diagnostic Tests

Pertaining to the cross-sectional data for Wave 1 and 2, the diagnostic tests required to be carried out prior to the bivariate and multivariate level of analysis included univariate and multivariate normality tests (Hair et al., 2014). At the cross-sectional bivariate level of analysis, for data to fit the requirements for an independent samples *t*-test and an Analysis of Variance (ANOVA) test, there was the need to assess normality of the distribution of the dependent variable and equal variances (homoscedasticity) across groups (Stockemer, 2019) using univariate diagnostic tests (Hair et al., 2014). Univariate normality measures for the dependent variable such as the shape of the distribution was assessed using the graphical method (histogram), and described by kurtosis and skewness of the distribution, which were all numerical measures. The numerical values of skewness and kurtosis of the distribution for the Wave 1 and 2 depression variables were greater than 0 and 3 indicating a positive skew of the skewness and non-symmetrical distribution of the kurtosis. A hypothesis test for the skew and kurtosis, which stated a null hypothesis that the dependent variables (depression in Waves 1 and 2) were normally distributed was rejected with $p<0.05$ for both kurtosis and skewness. Hence, the non-parametric test, Kruskal-Wallis H test, an alternative to the ANOVA parametric test was used at the bivariate level to examine the relationship between alcohol and mental health. The non-parametric bivariate Mann Whitney *U* test, an alternative to the independent samples *t*-test was also run (Saunders et

[4] See Appendices A and B for univariate and multivariate diagnostic test results (graphs and hypotheses tests)

al., 2009). For continuous independent variables, the Spearman's rank correlation a non-parametric test alternate to the Pearson's correlation coefficient was used.

Cross-sectional multiple regression analysis requires multivariate diagnostic tests for both study waves which assess the regression residuals (Hair et al., 2014), to ensure conditions for conducting multivariate analysis for continuous variables were satisfied. Results for these diagnostic tests were displayed with tables and graphs[5]. The various assumptions tested included normality, linearity, homoscedasity and multicollinearity (Hair et al., 2014).

To test for linearity was to find out the extent to which change in the response variable is related to the predictor variable (Hair et al., 2014). This was done using a scatter plot of the main independent (dummy variables created for the alcohol use categories), previous week alcohol use and the dependent variable (depression score) in both survey years.

Normality tests of the errors were conducted by assessing the histogram of the residuals and the Shapiro Wilk test for both survey waves. The hypothesis test for normality of distribution, the Shapiro-Wilk test, yielded $p<0.05$ hence rejecting the assumption that the residuals are normally distributed for both survey years.

The Beruch-Pagan test was used to test for multivariate homoscedasity and the spread of the scatter was displayed. Since $p<0.05$, the null hypothesis that there is a constant variance of errors was rejected, there was heteroscedasity in the Waves 1 and 2 outcome variables. This indicates a statistically significant unequal variance which could bias the standard errors as well as results.

[5] See Appendices A and B for univariate and multivariate diagnostic test results (Graphs and hypotheses tests)

To test for multicollinearity, the variance inflation factor (VIF) and tolerance were assessed. Since the VIF values were less than 10 and tolerance greater than 0.1, there was no multicollinearity among the independent variables in both survey years.

Since all but the multicollinearity assumption tests run did not meet the requirements for conducting a cross-sectional ordinary least-squares regression analysis, treating the outcome variable as a continuous variable would provide invalid estimates. Several statistical recommendations for adjusting the data to produce valid and generalizable results include the use of trimmed mean, winsorised mean, log-normal distribution, Box-Cox transformation, bootstrapping, multiple imputation, removing outliers (Afifi et al., 2007; Gunver et al., 2018). However, these methods sometimes disregard and distort the distribution as well as damage its nature (Gunver et al., 2018). Usually, log-transformations are carried out when the distribution is positively skewed to improve the validity of statistical conclusions from the results. The current study's data had most cases (95.2 % in Wave 1 and 92.5% in Wave 2) having a score of zero (no depression). Thus when the dependent variables were log transformed, the zero cases were changed to missing values meaning the log transformation of zero was not practicable (Karazsia & Van Dulmen, 2008). An alternative was to shift the distribution by changing the zeros to one as prescribed by Pevalin & Robson (2009). However, the score of zero represented an absence of poor mental health and so to shift the distribution by adding a score of one before log transformation would be invalid. With a highly skewed at zero outcome variable leading to the violation of the ordinary least squares assumption tests, alternative regression models requiring non-continuous outcome variables were considered in examining the relationship between alcohol use and mental health to arrive at the best fitting models for multivariate analysis.

Non-continuous considerations of the outcome variable included its treatment as either count or dichotomous variables (Xu et al., 2017). Previous studies assert that, treating count data as continuous outcome variable in a multiple regression or dichotomous outcome

variable in a logistic regression could bias the results or ignore significant variations in the data (Karazsia & Van Dulmen, 2008; Zaninotto & Falaschetti, 2011; Xu et al., 2017) hence the Poisson, Negative Binomial (NB), Zero-inflated Poisson (ZIP), and Zero-inflated Negative Binomial (ZINB) as count models were considered to be used to analyse the outcome variable for the cross-sectional and panel datasets. Various limitations of these count models required tests to find a best fitting model for the multivariate analysis as well.

The Poisson model assumes that model parameters are linear, individual observations are independent of one another, and the independent variables have a multiplicative effect (Yang & Berdine, 2015). It also assumes a distribution where variance is proportional to the mean, that is, a non-dispersed distribution (Rodriguez, 2013). Nonetheless, it is limited in that, the model cannot accommodate over dispersion and neglects excess zero counts. The NB model shares common assumptions with the Poisson model. Contrastingly, it overcomes the challenge of over dispersion and it also neglects excess zero counts. Therefore the parameter estimates would be biased when an outcome has huge proportion of zeros. The ZIP model has been suggested to overcome the challenges of over dispersion and excess counts (Afifi et al., 2007; Xu et al., 2017).

Univariate and Multivariate tests on over dispersion of distribution were carried out to ascertain the Poisson distribution assumption which stipulates that the observed variance should be equal to the mean (Williams, 2018). The univariate distribution test examined the mean and the variance of the depression variables for the cross-sectional data. Pertaining to Wave 1 and 2, the outcome variables showed a mean of 0.47 and 0.35 with variances three times (1.63 and 1.20) more than the mean respectively[6], signifying an over dispersion which violated the assumption of a Poisson distribution. For the multivariate test of over dispersion for the cross-sectional data, two tests were carried out after fitting a Poisson regression models for Wave 1 and 2 namely the likelihood ratio and the Deviance and Pearson

[6] See Appendix C for univariate and multivariate diagnostic tests for Waves 1 and 2 count outcome variables

goodness-of-fit χ^2 tests. The likelihood ratio test of alpha=0 rejected the null hypothesis that errors do not exhibit dispersion as $p<0.001$ for models of both waves. Additionally, the Deviance and Pearson goodness-of-fit χ^2 tests of the models were significant with $p<0.001$ for both waves. Both multivariate goodness-of-fit and likelihood ratio tests showed that the NB regression fitted better than the Poisson. This affirms what has been noted by various authors that NB allows for over dispersion (Williams, 2018). Subsequently, regression models for NB, ZIP and ZINB, were fitted and the goodness of fit tests[7]-Akaike Information Criterion (AIC), Bayesian Information Criterion (BIC) among other statistics and graphical methods suggested the ZIP regression models to be best fitting for Wave 1 and 2 cross-sectional data models.

To crosscheck the validity of this conclusion, 2 regression models for Wave 1 and 2 were fitted[8] using the "countfit" STATA command by Long & Freese (2014) which compared Poisson, NB, ZIP and ZINB models. The tests and fit statistics consistently showed that ZIP was preferred over the other count models as they were not statistically significant and or had larger AIC and BIC statistic hence indicating the other models as not efficient estimators. Based on these, the ZIP model was used to fit regression models for Wave 1 and 2. Having concluded on NB and ZIP regression models as best fitting for the cross-sectional multivariate analysis, the model was estimated with robust standard errors to ensure the variance was not misspecified.

3.4.2.3.2 Panel Data Diagnostic Tests

A feature of the panel data analysis which serves as an advantage over cross-sectional data is that it takes into consideration the fact that repeated observations of individuals correlate with each other over time (Hans-Jürgen et al., 2013). Several factors

[7] See Table C2 in Appendix C for the goodness-of-fit statistics AIC, BIC for Poisson, NB, ZIP, and ZINB as well as the Selection Criteria of the best fitting models

[8] See Tables C3, C4 and Graph C1 in Appendix C for tests, fit statistics and graphs comparing the 4 models for Wave 1 and 2

could cause the misspecification of a panel model leading to poor estimates, which digress from the true population parameter estimates. These include selectivity due to sample attrition, omitted variables, measurement errors among others hence the panel models must meet the assumptions of exogeneity, homoscedasity, no serial correlation and no measurement error to produce unbiased estimates. The assumption of exogeneity requires that the independent variables are not influenced by past or future factors not controlled for in the model either because we do not know them or the data do not measure the variables. Homoscedasity assumption demands that there is a constant variance of the error term. The assumption of no serial correlation involves the time varying errors being independent of each other. In addition, the assumption of no measurement error entails precisely measuring the explanatory variables according to theoretical constructs. This challenge is curbed, as variables used in this study are standardised measures with high reliability values. To address endogeneity, as indicated by Rabe-hesketh (2013) fixed effects model estimates were compared to the random effects estimates. The null hypothesis tested was that the random model was appropriate. Since the compared coefficients were not significantly different ($p>0.001$), the null hypothesis was accepted and the random effects models were run.

3.4.2.4 Quantitative Data Analysis

Quantitative analysis was performed using STATA (version 15.0) and IBM® SPSS (Version 24). Cross-sectional and panel analyses were carried out at the univariate, bivariate and multivariate levels based on the objectives of this study. The cross-sectional data were to examine variations between individuals (the cross-section of respondents) in terms of their alcohol use and their mental health in the individual survey years of Wave 1 and 2, whereas the panel data were to show both between and within individual changes in alcohol use and mental health. Further, the panel highlighted how changes in alcohol use at one point in time related to changes in mental health scores at follow up controlling for time.

Analysis at the univariate, bivariate and multivariate levels was stratified by gender due to expected differences in the sociodemographic characteristics, lifestyle and health-related factors of men and women in this study as well as the differential influence of alcohol consumption on mental health. The bidirectional multivariate analysis was not disaggregated by gender as its explanatory variable (past week's alcohol use) was count and not categorical which would have necessitated the analysis to be carried out separately for men and women because of different alcohol use thresholds for the genders.

3.4.2.4.1 Objective 1: Levels and Changes in Alcohol Use and Mental Health in Ghana

3.4.2.4.1.1 Cross-sectional and Panel Univariate Analysis

For the first objective, to examine the levels and changes in alcohol use and mental health across all 2 waves, cross-sectional univariate analysis was carried out with frequency tables and histograms showing proportions of respondents in each alcohol use category. Count and continuous variables were summarised using means and standard deviations.

Panel univariate analysis reported transition probabilities to describe changes in the categorical independent variable (alcohol use status) across time. Changes in the outcome variable were displayed with summary statistics. These comprised of the mean and standard deviations which were broken down into between - variations among individuals, and within - variations within the individual over time.

3.4.2.4.2 Objective 2: Cross-sectional Relationship between Alcohol use and Mental Health among Men and Women in Ghana.

3.4.2.4.2.1 Cross-sectional Bivariate Analysis

As part of the second objective, the cross-sectional bivariate analysis assessed the gross effect of alcohol use on mental health in Waves 1 and 2. Since the dependent variable was a count variable and some independent variables with three or more categories did not meet the assumption of homoscedasity ($p<0.05$), a series of non-parametric tests comprising

of Kruskal-Wallis H, Mann-Whitney U and Spearman's rank correlation tests were run. These tests overcome the problem of non-normality in distribution by ranking the data (Field, 2018). The Kruskal-Wallis H and Mann-Whitney U tests compared the distribution of ranks of counts of depression symptoms across the explanatory, control variables, and tested the statistical differences in their association. The Kruskal-Wallis H test, a non-parametric alternative to the ANOVA test of mean difference specifically compared the ranked means of more than two independent groups. The Mann-Whitney U Test a non-parametric alternative to the independent samples t-test compared the ranked mean across two independent groups. The Spearman's Rank Correlation Test is a non-parametric alternative to Pearson's product moment correlation highlighted the strength, direction and association between depression and continuous variables considered in the study.

3.4.2.4.2.2 Cross-sectional Multivariate Analysis

This analysis aimed at assessing the net influence of alcohol use on mental health separately for each survey year by controlling for sociodemographic, lifestyle and health-related variables. To achieve this, multivariate Zero-inflated Poisson regression models were used to examine the cross-sectional relationship between alcohol use status and depression of men and women in Waves 1 and 2.

3.4.2.4.3 Objectives 3 and 4: Longitudinal Relationship between Alcohol Use and Mental Health among Men and Women.

3.4.2.4.3.1 Panel Multivariate Analysis

Unlike cross-sectional count models which have four estimators namely, the Poisson, NBREG, ZIP, and ZINB models, the panel count models have only two estimators that can be run by the STATA software, the Poisson and the NBREG models. In this study, the Poisson panel models were run instead of the NBREG Poisson models because it has been demonstrated to be more robust and produces reliable estimates (Wooldridge, 1999).

The essence of the third objective was to use the panel data to find out whether there was a longitudinal relationship between categories of alcohol use statuses and mental health of men and women as well as the magnitude of effect for the various categories of alcohol users. Hence, the Poisson panel random effects models were run separately for men and women controlling for both time variant and time invariant factors

3.4.2.4.3.2 Panel Multivariate Bidirectional Analysis

The second purpose of the panel data was to investigate the direction of the longitudinal relationship (whether unidirectional or bidirectional) between previous week's counts of standard alcoholic drinks consumed and mental health by adjusting for both time variant and time invariant factors. Subsequently, the Poisson panel random effects models were run for the total sample controlling for both time variant and time invariant factors.

3.4.2.4.4 Zero-inflated Poisson and Random Effects Poisson Models Estimation

The Zero-inflated Poisson and Random Effects Poisson model distributions were used to fit counts of symptoms of depression. Both models controlled for sociodemographic, lifestyle and health-related variables. The ZIP models shown in Equation (1) comprise of two parts, which include the logistic and the count model sections to account for the

excess zero counts (Zaninotto & Falaschetti, 2011; Xu et al., 2017).

$$\text{Prob}(Y_{it} = y_{it}|X_{it}) = \begin{cases} \pi_{it} + (1-\pi_{it})e^{-\mu_{it}} & y_{it} = 0 \quad \text{Logit section} \\ (1-\pi_{it})\frac{e^{-\mu_{it}}\mu_{it}^{y_{it}}}{y_{it}!} & y_{it} =\geq 1 \quad \text{Poisson section} \end{cases} \qquad (1)$$

$$\mu_{it} = E(Y_{it}|X_{it}) = exp\{\beta_{0t} + \beta_{1t}X_{i1t} + \beta_{2t}X_{i2t} + \cdots + \beta_{pt}X_{ipt}$$

Where:

$\boldsymbol{Y_{it}}$ = The estimated probability of count of symptoms of depression for the i^{th} subject at Wave t

$\boldsymbol{y_{it}}$ = The random variable that shows the number of counts of symptoms of depression for the i^{th} subject at Wave t

$\boldsymbol{X_{it}}$ = $\{1+X_{i1}+X_{i2}+...+X_{ip}\}$ A vector of covariates plus 1 and β_0 ... β_p regression coefficients to be estimated at Wave t

$\boldsymbol{\pi_{it}}$ = The probability of being an extra zero, which is determined by the logistic model at Wave t

$\boldsymbol{\mu_{it}}$ = Mean and variance of the Poisson distribution (the expected number of events) at Wave t.

The random effects Poisson panel regression model is presented in equation (2) as obtained from Vinícius de Azevedo Couto and Cláudio Roberto (2020). The model incorporates an unobserved effect (c_i), assumed to be constant over time. The presence of the (c_i) could influence model overdispersion. However, the random effects Poisson model uses the overdispersion from the unobserved effect (c_i) to generate efficient estimates. The model first assumes that there is exogeneity between the unobserved effect (c_i) and the explanatory variables(X_{it}). Second, it follows a Poisson distribution, that is events occur at a constant rate within a period of time as depicted in equation (3). Third, it assumes there is no serial correlation between the error terms (Equation (3)). Lastly the unobserved effect (c_i) shows a Gamma distribution and its mean in not affected by the explanatory variables(X_{it}) as indicated in (Equation (4)).

$$\mathrm{E}\,(y_{it}|X_{it}, c_i) = c_i \left\{ \frac{e^{-exp(x_{it}^{'}\ \beta)} exp(x_{it}^{'}\ \beta)^{y_{it}}}{y_{it}!} \right\} = c_i[\mathrm{E}\,(y_{it}|X_{it})] \quad (2)$$

$$\mathrm{E}\,(y_{it}|X_{it}, c_i) \text{ is independent from } \mathrm{E}\,(y_{ir}|X_{it}, c_i), \text{ where } t \neq r \quad (3)$$

$$\mathrm{E}\,(c_i|X_{it}) = \mathrm{E}\,(c_i);\ c_i \tilde{G}ama \quad (4)$$

Where:

$\boldsymbol{c_i}$ = Unobserved effect

$\boldsymbol{Y_{it}}$ = The estimated probability of count of symptoms of depression for the i^{th} subject at Wave t

$\boldsymbol{X_{it}}$ = A matrix of explanatory variables

$\boldsymbol{\beta}$ = Parameters associated with the the matrix of explanatory variables

3.4.2.5 Limitations of Study

Measures of the independent and outcome variables were based on self-reports. The validity of using self-reports is often questioned (Drèze and Sen, 2001; Sen, 2002; Frankenberg & Jones, 2004). It has been argued that some disadvantaged subgroups of the population may fail to report symptoms of depression, some may overrate while others may underrate their ill health. For instance, older individuals are more likely to report poor health

than their younger counterparts while women report worse health than their male peers at each age group. DSM-IV diagnostic criteria, as a polythetic diagnostic model, described as improving the reliability of psychiatric diagnosis (Parnas, 2015), has been validated in general population surveys (Lux & Kendler, 2010), epidemiologic, clinical studies (Cuijpers et al., 2007) among others. It has been considered as robust as it avoids medicalising normal emotional experiences or false positives by stipulating that symptoms reported should not be as a result of bereavement, unless they persist for over two months leading to clinically significant impairment in mental and physical functioning (Regier, 2012). Further, the algorithm specifying that these symptoms should not be a result of a substance (medication or drug use) or a medical condition (APA, 2000; Regier, 2012) which are emphasized on during interviews ensures its robustness. Together with this, other studies have shown that although they are subject to misreporting, self-reports are reasonably accurate, reliable and sufficiently sensitive for public health surveillance (Otten et al., 2018).

Similarly, the validity of self-reports of alcohol consumption has been questioned as it is subject to underreporting due to recall bias and social desirability (Martinez, 2013; McKenna et al., 2018). Recall bias could be due to length of time of event occurrence and circumstance of event occurrence. A shorter length of time of event occurrence has demonstrated measure validity in various studies (McKenna et al., 2018). A circumstance of intoxication during period of alcohol consumption hinders the possibility of recall of the quantity of alcohol (for binge and hazardous drinkers) consumed during an interview. Despite these, systematic reviews and individual studies have confirmed the validity of using self-reports of alcohol consumption (Martinez, 2013; McKenna et al., 2018).

The limitation that previous week's quantity of alcohol consumed may not necessarily be a habit or trend among current alcohol users every week has been noted. Nonetheless, it has been found to be a valid and reliable measure because it facilitates recall as it has a shorter length of time of occurrence (McKenna et al., 2018). Further, in a context

of scarce panel data on alcohol consumption, previous week's number of standard drinks consumed lends an insight into the patterns of alcohol consumed by the population.

Self-reports of physical activity and physician diagnosis of co-morbidity are subject to recall bias. First, physical activities that occurred recently are likely to be recalled more accurately than those in a longer length of time are. Second, there could be reporting of higher activity levels in some physical activity domains and lower in others. Pertaining to self-reported physician diagnosis of co-morbidity, multiple chronic conditions may be underreported particularly in lower socioeconomic groups. These may have implications in terms of estimating their association with depression symptoms. Extant literature have however shown that these limitations may not significantly affect the results as the SAGE survey took measures such as using easily recognizable diagnosis terms and asking whether respondents took medications or received treatment for their conditions during the interviews (Vellakkal et al., 2015).

A noted limitation was with secondary analysis of qualitative data. Secondary analyses of qualitative data has been in existence since the mid-1990s (Heaton, 2008). Issues of poor data fit; the challenge of interpreting data that were collected by a different researcher and difficulty with verifying of results has been raised with secondary analysis of data. Various processes were followed in this study to overcome these challenges. First, the PI of the qualitative study who was on the field was involved in the reviewing of codes and results of the thematic analysis. Further, to ensure credibility and confirmability, techniques and paths that led to analyses, interpretation of data and conclusion such as the following were carried out: thick description and detailed depiction of the experiences, and emotions, verbatim narratives of individuals and group accounts of community level perceptions and ideas. In all, the quantitative data validated the qualitative data as cross-sectional and panel results of this study similarly showed stressful life situations such as

food insecurity, marital status, employment status, tobacco use and chronic conditions as being linked to poor mental health.

As one of the objectives was to examine the bidirectional relationship between alcohol use and mental health, it was expedient to conduct a latent change score modelling analysis (LCSM) for an in-depth understanding of the pattern of change over time. The availability of three or more waves provides markedly more information on the trajectories that is the nature, form and structure of change (Allison, 1994; Cole & Maxell, 2003; Johnson, 1995a, 1995b). However, at the period of conducting this study only two waves with the same variables measured existed. Though analysing three or more waves has merits, the analysis of two-wave data in this study still provided valid inferences as robust methods of analyses were used and goodness of fit tests conducted showed validity of the models.

Omitted sample bias has been a limitation in various studies and this study is no exception. Although the panel was balanced as information of persons who participated in both waves were analysed, the problem of selectivity due to attrition was likely. Omitting sampled respondents refusing to be part of the survey, those who could not be contacted as well as those who provided inconsistent responses to the key independent variable (alcohol use) from the analysis, could bias the results. This is because, they could belong to a certain age or social class which are more likely to influence the outcome of interest than those currently surveyed. Consequently, the remaining sample may not be representative of the population. A first step to reduce bias was that respondents who had reported having ever used alcohol and indicated their use status (current i.e. moderate or heavy drinkers) in Wave 1 but did not indicate their current use status in Wave 2 were categorised as ever used in Wave 2 rather than being omitted from the analysis.

Weighting of data was also a suggested means of dealing with omitted sampled respondents. Hence, estimates were weighted to reflect population estimates at the

univariate level. The decision to use sampling weights at the bivariate and multivariate levels were carefully evaluated, as unweighted multivariate estimates have been found to be more efficient compared to weighted estimates when the weights do not significantly influence the parameter estimates (Winship & Radbill, 1994). For the evaluation, an F-test suggested by DuMouchel and Duncan (1983), Winship and Radbill (1994) and Hans-Jürgen et al., (2013) was performed. There was no statistically significant difference between the weighted and unweighted estimates ($p=0.996$) meaning that, unweighted estimates were not biased by sample matching procedure (sample selection) hence reporting them was more efficient.

CHAPTER FOUR

ALCOHOL USE AND MENTAL DEPRESSION IN GHANA: PREVALENCE AND VARIATIONS

4.1 Introduction

This section answers the research question on the levels and changes in alcohol consumption and counts of symptoms of depression over time among adults in Ghana using the WHO SAGE Wave 1 (2007) and Wave 2 (2014) Survey Datasets. Univariate and non-parametric bivariate descriptive results are presented for the total sample of respondents and separately for men and women. Specifically, the univariate level results highlight cross-sectional individual, household, lifestyle and health-related characteristics of respondents in Waves 1 and 2. Following this, the prevalence, changes in alcohol consumption and the number of symptoms of depression over the two surveys are depicted. Subsequently, bivariate statistics on differences in the number of symptoms of depression across sociodemographic, household, lifestyle and health-related factors are shown.

4.2 Sociodemographic Characteristics of the Sample

Describing the study sample is important as it helps to show the features of the sample, specifically the distribution of respondents across variable categories. Descriptive statistics also serve to determine the level at which results could be generalised to other populations (Pickering, 2017).

Table 4.1 depicts the cross-sectional description of socio-demographic background of male and female participants in Waves 1 (2007) and 2 (2014) with chi square analysis showing gender differences in their characteristics. There were 1,499 adults aged 23 years and older included in the study in 2007 of which 775 (51.7%) were men and 724 (48.3%) were women. With regard to weighted estimates of the total sample, a high proportion of respondents were less than 50 years (65.3%) and reported an average age of 48 years in Wave 1. The proportion of the population married declined by 8.6 percentage points in

Wave 2 with more men being married compared to women in both waves. A high percentage of the sample were employed in both waves but they decreased by 13 percentage points in Wave 2. Within the survey period, more men were employed compared to women, that is 89.2% versus 81.4% in Wave 1 and 77.9% and 64.3% in Wave 2 respectively. Over 70% of the sample were affiliated to the Christian Religion in both waves with more women being Christians compared to men. A high percentage of men (44.8% and 39.4%) had secondary or higher level of education than their female counterparts (30.2% and 23.2%) in Waves 1 and 2 respectively. More respondents belonged to the middle wealth quintile in Wave 1. However, in Wave 2 there were more persons belonging to the rich quintile indicating an increase in wealth of the sample within the survey period. About 61% and 54% of the full sample resided in the rural areas in Waves 1 and 2 with a higher proportion of men living in rural areas than women. In Waves 1 and 2, the highest and least proportion of the sample were from Ashanti (19.6% and 15.1%) and Upper West (2.8% and 1.7%) Regions.

Table 4.1 Characteristics of Respondents Stratified by Gender

Demographic Background	Wave 1				Wave 2			
	Male (n=775) n (%)	Female (n=724) n (%)	*pvalue*	Total sample (N=1499) n (%)	Male (n=775) n (%)	Female (n=724) n (%)	*pvalue*	Total sample (N=1499) n (%)
Age Groups			0.186				0.044	
Less than 50 years	506 (65.2)	473 (65.3)		978 (65.3)	298 (38.5)	168 (23.3)		485 (32.4)
50 years and above	269 (34.8)	251 (34.7)		521 (34.7)	447 (61.5)	556 (76.7)		1014 (67.6)
Age in Years								
Mean (SD)	47.9 (13.5)	48.5 (12.4)	0.186	48.2 (13.0)	56.3 (14.2)	61.4 (14.1)	0.016	58.3 (14.4)
Minimum-Maximum	25-94	23-98		23-98	32-101	30-106		30-106
Marital Status			0.000				0.000	
Currently not married	87 (11.2)	357 (49.3)		449 (29.9)	153 (19.8)	479 (66.2)		577 (38.5)
Currently Married	688 (88.8)	367 (50.7)		1050 (70.1)	622 (80.2)	245 (33.8)		922 (61.5)
Currently working							0.001	
No	83 (10.8)	135 (18.6)	0.000	219 (14.6)	171 (22.1)	259 (35.7)		414 (27.6)
Yes	692 (89.2)	589 (81.4)		1280 (85.4)	604 (77.9)	465 (64.3)		1085 (72.4)
Religion			0.000				0.000	
None	41 (5.3)	34 (4.7)		75 (5.0)	39 (5.0)	31 (4.3)		71 (4.7)
Christian	539 (69.6)	582 (80.4)		1122 (74.9)	566 (73.1)	558 (77.0)		1119 (74.7)
Islam	124 (15.9)	76 (10.4)		198 (13.2)	141 (18.2)	115 (15.9)		259 (17.3)
Traditional Religion	71 (9.2)	33 (4.5)		103 (6.9)	30 (3.8)	20 (2.7)		51 (3.4)
Level of Education			0.000				0.000	
None	172 (22.2)	286 (39.6)		461 (30.7)	197 (25.5)	348 (48.1)		519 (34.6)
Primary	256 (33.0)	219 (30.3)		475 (31.7)	272 (35.2)	208 (28.7)		488 (32.6)
Secondary/higher	347 (44.8)	218 (30.2)		563 (37.6)	305 (39.4)	168 (23.2)		492 (32.8)
Wealth Quintile			0.000				0.000	
Poorest	174 (22.5)	102 (14.1)		275 (18.3)	130 (16.7)	79 (11.0)		216 (14.4)
Poor	140 (18.1)	134 (18.6)		274 (18.3)	139 (17.9)	156 (21.6)		291 (19.4)
Middle	151(19.4)	187 (25.8)		338 (22.6)	155 (20.1)	153 (21.1)		307 (20.5)
Rich	142 (18.3)	129 (17.8)		270 (18.0)	282 (36.4)	256 (35.3)		539 (36.0)
Richest	169 (21.8)	172 (23.8)		22.8 (34.1)	69 (8.9)	80 (11.0)		146 (9.7)

Source: Computed from WHO SAGE Survey Data; 2007 & 2014

Note. Not all frequency sums between variable categories are equal. This is due to missing data

Weighted estimates are shown

*** p<0.001, ** p<0.01, * p<0.05

Table 4.1 Characteristics of Respondents Stratified by Gender (continued)

Demographic Background	Wave 1				Wave 2			
	Male (n=775) n (%)	Female (n=724) n (%)	*pvalue*	Total sample (N=1499) n (%)	Male (n=775) n (%)	Female (n=724) n (%)	*pvalue*	Total sample (N=1499) n (%)
Place of Residence			0.000				0.000	
Urban	241 (31.1)	344 (47.5)		587 (39.1)	326 (42.1)	384 (53.1)		697 (46.5)
Rural	534 (68.9)	380 (52.5)		912 (60.9)	449 (57.9)	340 (46.9)		802 (53.5)
Region of residence			0.000				0.000	
Ashanti Region	125 (16.1)	168 (23.2)		294 (19.6)	107 (13.8)	124 (17.2)		227 (15.1)
Brong Ahafo Region	90 (11.5)	114 (15.8)		204 (13.6)	75 (9.6)	79 (10.9)		152 (10.1)
Central Region	87 (11.2)	103 (14.2)		190 (12.7)	52 (6.8)	95 (13.1)		140 (9.3)
Eastern Region	74 (9.5)	56 (7.7)		130 (8.7)	117 (15.1)	66 (9.1)		190 (12.7)
Greater Accra Region	71 (9.2)	73 (10.1)		145 (9.6)	111 (14.3)	109 (15.0)		218 (14.6)
Northern Region	68 (8.7)	35 (4.8)		102 (6.8)	75 (9.7)	62 (8.5)		138 (9.2)
Upper West Region	17 (2.2)	24 (3.4)		42 (2.8)	13 (1.7)	11 (1.6)		25 (1.7)
Upper East Region	33 (4.2)	22 (3.0)		55 (3.6)	34 (4.4)	19 (2.6)		55 (3.7)
Volta Region	107 (13.7)	62 (8.6)		168 (11.2)	128 (16.5)	84 (11.7)		218 (14.5)
Western Region	104 (13.5)	66 (9.1)		170 (11.3)	63 (8.1)	75 (10.4)		135 (9.0)

Source: Computed from WHO SAGE Survey Data; 2007 & 2014

Note. Not all frequency sums between variable categories are equal. This is due to missing data

Weighted estimates are shown

*** p<0.001, ** p<0.01, * p<0.05

4.3 Lifestyle, Health-Related and Household Characteristics of the Sample

Table 4.2 shows individual and household characteristics of the sample pertaining to their lifestyle, health and their experience of food insecurity by gender in Waves 1 and 2. On health-related characteristics, respondents indicating ever using tobacco increased by about 9 percentage points with a higher percentage of men (26.6% and 36.9%) indicating having ever used tobacco in both Waves. Similarly, the proportion of the sample who indicated to be physically active decreased from 89.6% to about 66.6%. A higher percentage of men reported to be physically active than women. Six out of ten and five out of ten of the total sample reported taking less than five servings of fruit and vegetables a day in both waves, while the proportion taking more than five servings of fruit and vegetables a day increased from 32.3% to 48.8%. More women than men consumed healthy diet. Concerning BMI, 62.4% of the total sample were normal weight. The proportion of persons who were underweight increased by 45.7% and the percentage of persons who were overweight or obese decreased by 4.8% by the second wave. A higher proportion of women, than men were overweight or obese in both waves. The average number of chronic conditions were 0.2±0.5 in the first wave and increased slightly to 0.3±0.6 in Wave 2. Further, the proportion of respondents who reported taking medicine for any chronic condition or antidepressants decreased substantially by 88.9% by Wave 2 and was higher among women relative to men. Fewer respondents (5.2%) indicated that they experienced bodily injuries from either road, other accidents, fire, fall, violence in the 12 months prior to the survey by Wave 2. Participants indicated lower health scores in Wave 2 compared to Wave 1. This implies that their reported health improved by the second Wave from an average score of 23.6 ± 20.3 to 16.7 ± 16.8. Females reported worse health compared to men as they had higher scores over the two waves. Social capital scores declined from an average score of 57.7 ± 16.7 in Wave 1 to 46.8 ± 17.1 in Wave 2 signifying decreased social interaction or networking by

participants over the two time points. There was a gender difference in social interactions of participants in both waves with men having higher scores compared to women.

Stress could be induced by circumstances at the household and individual levels. At the household level, respondents reported on their financial and debt situation. Both household financial and debt situation improved as more than half of respondents (58.6%) reported their financial situation as good and 90.1% indicated their household not currently having any debt or unpaid loans by Wave 2. On gender differences, in household financial situation and debt, higher proportion of men indicated better household financial situation compared to women whereas fewer women and men reported having household debts in Waves 1 and 2 respectively.

At the individual level, a source of stress, which was food insecurity, was assessed in the sample. There was a marginal decline in proportions of the total sample reporting to have ever been hungry without money to buy food by Wave 2 as there was a 2.6% decrease. A higher proportion of women and men had ever been food insecure in Waves 1 and 2 respectively.

Table 4.2 Lifestyle Behaviour, Heath-related Characteristics, Other Household and Individual Factors Stratified by Gender

Variable	Wave 1				Wave 2			
	Male (n=775) n (%)	Female (n=724) n (%)	*pvalue*	Total sample (N=1499) n (%)	Male (n=775) n (%)	Female (n=724) n (%)	*pvalue*	Total sample (N=1499) n (%)
Lifestyle factors								
Tobacco use			0.000				0.000	
Never used	569 (73.4)	684 (94.5)		1256 (83.8)	489 (63.1)	651 (89.9)		1108 (73.9)
Ever used	206 (26.6)	40 (5.5)		243 (16.2)	286 (36.9)	73 (10.1)		391 (26.1)
Physical Activity			0.003				0.254	
Inactive	49 (6.3)	106 (14.6)		156 (10.4)	225 (29.0)	289 (39.9)		500 (33.4)
Active	726 (93.7)	618 (85.4)		1343 (89.6)	550 (71.0)	435 (60.1)		999 (66.6)
Diet			0.294				0.144	
Unhealthy	551 (71.1)	464 (64.1)		1014 (67.7)	387 (49.9)	385 (53.1)		768 (51.2)
Healthy	226 (28.9)	260 (35.9)		485 (32.3)	388 (50.1)	339 (46.9)		731 (48.8)
BMI			0.000				0.000	
Underweight	67 (8.8)	55 (7.8)		124 (8.3)	103 (13.8)	64 (9.6)		172 (12.1)
Normal	555 (73.0)	366 (51.4)		936 (62.4)	477 (64.2)	360 (53.4)		849 (59.9)
Overweight	92 (12.1)	193 (27.1)		291 (19.4)	141 (18.9)	116 (17.2)		259 (18.2)
Obese	47 (6.1)	98 (13.8)		148 (9.9)	23 (3.1)	134 (19.8)		138 (9.7)
Physical Health								
Chronic Conditions[a]			0.000				0.000	
Mean (SD)	0.2 (0.5)	0.2 (0.5)		0.2 (0.5)	0.2 (0.5)	0.3 (0.7)		0.3 (0.6)
Minimum-Maximum	0-3	0-3		0-3	0-3	(0-4)		0-4
Medication			0.000				0.281	
No	695 (89.7)	598 (82.6)		1292 (86.2)	766 (98.8)	711 (98.2)		1477 (98.6)
Yes	80 (10.3)	126 (17.4)		207 (13.8)	9 (1.2)	13 (1.8)		22 (1.4)
Injury			0.387				0.016	
No	732 (94.4)	670 (92.6)		1402 (93.5)	728 (93.9)	696 (96.2)		1421 (94.8)
Yes	43 (5.6)	54 (7.4)		97 (6.5)	47 (6.1)	28 (3.8)		78 (5.2)

Source: Computed from WHO SAGE Survey Data; 2007 & 2014

Note. Not all frequency sums across variables are equal due to missing data

[a] Score of chronic conditions: Higher scores indicate more chronic conditions and lower scores indicate fewer chronic conditions

Weighted estimates are shown

Table 4.2 Lifestyle Behaviour, Heath-related Characteristics, Other Household and Individual Factors, Wave 1 and 2 (continued)

	Wave 1				Wave 2			
Variable	Male (n=775) n (%)	Women (n=724) n (%)	*pvalue*	Total sample (N=1499) n (%)	Male (n=775) n (%)	Women (n=724) n (%)	*pvalue*	Total sample (N=1499) n (%)
Self-Reported Health [b]			0.000				0.000	
Mean (SD)	19.8 (18.0)	27.6 (21.7)		23.6 (20.3)	13.5 (15.2)	21.3 (17.9)		16.7 (16.8)
Minimum-Maximum	0-95	0-100		0-100	0-100	0-96		0-100
Social Capital [c]			0.000				0.000	
Mean (SD)	62.7 (16.3)	52.5 (15.4)		57.7 (16.7)	49.0 (17.0)	43.6 (16.7)		46.8 (17.1)
Minimum-Maximum	16-100	12-88		12-100	8-100	2-100		2-100
Food insecurity			0.715				0.009	
Never	616 (79.4)	544 (75.1)		1159 (77.3)	575 (74.2)	604 (83.4)		1168 (77.9)
Ever	159 (20.6)	180 (24.9)		340 (22.7)	200 (25.8)	120 (16.6)		331 (22.1)
HH Financial Situation			0.119				0.085	
Bad	493 (63.6)	489 (67.5)		982 (65.5)	308 (39.8)	318 (43.9)		621 (41.4)
Good	282 (36.4)	235 (32.5)		517 (34.5)	467 (60.2)	406 (56.1)		878 (58.6)
HH Debt			0.729				0.177	
No	483 (62.4)	575 (79.4)		1061 (70.8)	711 (91.7)	635 (87.7)		1350 (90.1)
Yes	292 (37.6)	149 (20.6)		438 (29.2)	64 (8.3)	89 (12.3)		149 (9.9)

Source: Computed from WHO SAGE Survey Data; 2007 & 2014

Note. Not all frequency sums across variables are equal due to missing data

[b] Standardised score of self-reported health: Higher scores indicate worse health and lower scores indicate best health

[c] Standardised social capital score: Higher scores indicate high social capital and lower scores indicate low social capital

Weighted estimates are displayed

*** p<0.001, ** p<0.01, * p<0.05

4.4 Prevalence of Alcohol Consumption

This study examined the cross-sectional prevalence of alcohol use among the total sample on the one hand and male and female respondents on the other hand in Waves 1 and 2. The prevalence was segregated by sex as various alcohol consumption guidelines specify different thresholds for men and women in recognition of the physiological differences in the sexes, which make women more vulnerable to dire health consequences of alcohol use. The alcohol use variable was first considered as a categorical variable to examine changes in alcohol use status and subsequently considered as a discrete variable to assess counts of alcoholic drinks consumed by men and women.

Figure 4.1 displays the cross-sectional distribution of the total sample of respondents by their alcohol use status and further stratified alcohol use status by gender over the two waves. Pertaining to the total sample, the proportions of lifetime abstainers, moderate and heavy drinkers declined, whereas former users increased. Notably, moderate drinkers decreased significantly by 33.8%. Respondents indicating to have ever used alcohol but did not mention their status of use (whether former, moderate or heavy drinker) in Wave 2 were about 15%. They were kept as a category because having ever taken alcohol could influence one's mental health.

The cross-sectional gender differences in alcohol use status analysis showed that fewer men (24.3%) and women (47.2%) indicated they had never used alcohol in their lifetime by Wave 2. The percentage decrease was greater for men (17.4%) than for women (8.4%) indicating that more men became ever users of alcohol between the two waves. In Wave 2, about 16% of men and 13% of women had ever used alcohol but did not indicate their current use status. Additionally, the proportion of male and female subjects who indicated they had ever used alcohol, however not in the past 12 months (former drinkers) increased slightly from 24.3% to 25.6% and 28.9% to 30.7% respectively by Wave 2. The proportion of male and female respondents who reported taking up to 7 and 14 standard

drinks respectively (moderate drinkers) in the previous week in Wave 1 decreased by about 23.9% and 63.3% respectively by Wave 2. Similarly, men and women indicating taking more than 8 and 14 standard drinks (heavy drinkers) respectively a week prior to the survey decreased by 36.1% and 19.5% respectively by Wave 2.

Figure 4.1 Distribution of the Total Sample (Top) and Males and Females (Bottom) by their Alcohol Use Status in Wave 1 and 2

Source: Computed from WHO SAGE Survey Data; 2007 & 2014

4.5 Counts of Standard Drinks of Alcohol

The independent variable, alcohol use was considered as a count variable in the panel analysis to facilitate a bidirectional analysis of the relationship between counts of standard drinks hence the need for descriptive statistics on it. Table 4.3 displays summary statistics of counts of standard drinks of alcohol consumed in the week prior to the survey. Generally, alcohol consumption declined in the total sample by Wave 2. The average number of standard drinks consumed by men decreased to 3.7 standard drinks in Wave 2 while that of women remained at one standard drink (1.07).

Table 4.3 Summary Statistics of Counts of Standard Alcoholic Drinks Consumed

Sample	Alcohol use	Size	Mean	Std. Dev.	Min	Max
Total Sample	Wave 1	1499	3.27	7.86	0	70
	Wave 2	1498	2.64	6.13	0	46
Male	Wave 1	775	5.00	9.63	0	70
	Wave 2	774	3.70	6.76	0	46
Female	Wave 1	724	1.53	4.88	0	56
	Wave 2	724	1.07	4.66	0	36

Source: Computed from WHO SAGE Survey Data; 2007 & 2014
Weighted estimates are shown

Figure 4.2 shows a bar graph of counts of standard alcoholic drinks consumed in the total sample and among men and women in Wave 1 and 2. In the total sample, past-week drinking declined by Wave 2 with a high proportion of respondents (75.2%) reporting zero standard drinks in the week prior to the survey (Wave 2) compared to 15.1% in who reported zero standard drinks in Wave 1. The decline of counts of standard drinks consumed by Wave 2 was highest among females compared to males. This was signified by an increase in proportion of women reporting 0 counts of standard drinks (84.5% to 91.3%) by Wave 2 in addition to a decrease in counts of 1 to 15 and above standard drinks of alcohol.

Figure 4.2 Counts of Standard Alcoholic Drinks Consumed by Total Sample, Men and Women in Wave 1 and 2

Source: Computed from WHO SAGE Survey Data; 2007 & 2014

4.6 Changes in Alcohol Use

As differentiated from the descriptive results on alcohol use in the previous subsection, this subsection provides estimates that take into account the panel structure of the data by linking participants' information in both waves to show the within and between individual changes in alcohol consumption.

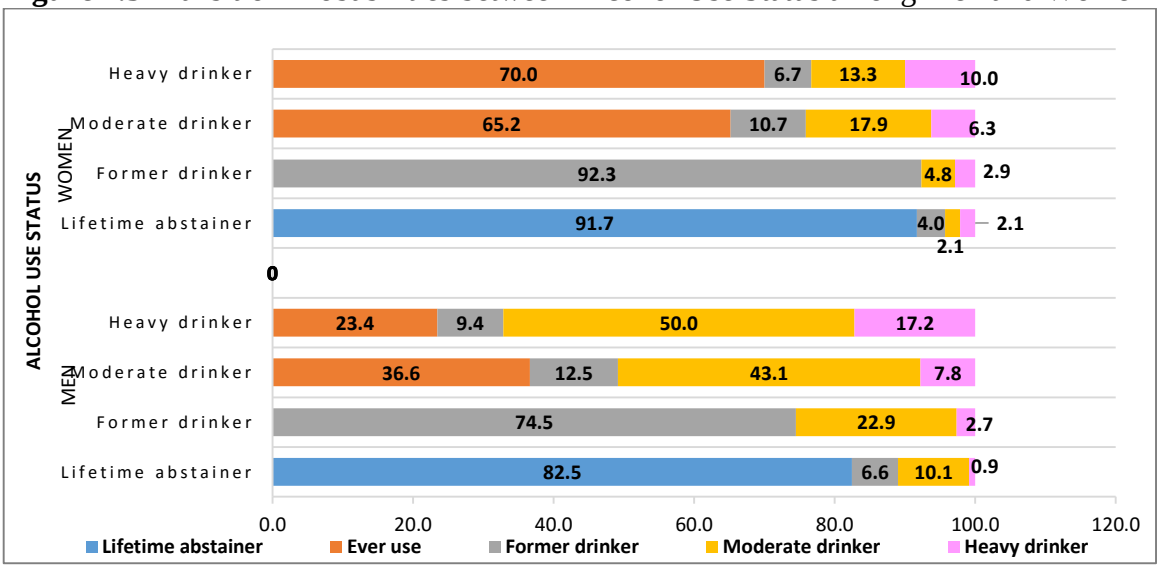
Figure 4.3 displays the longitudinal changes in alcohol use status of men and women between Waves 1 and 2. Among male lifetime abstainers, 82.5% remained abstainers by Wave 2. Of those who were no longer abstainers, 6.6%, one in ten and 1% became former, moderate and heavy users of alcohol respectively. About 74.5% of men who reported having ever consumed alcohol in their life time but have not consumed in the previous 12 months in Wave 1 (former drinkers) remained former drinkers in Wave 2. Of the remaining 25% who had been former drinkers in Wave 1, 22.9% became moderate drinkers and 2.7% became heavy drinkers. Men who were moderate drinkers in Wave 1 and 2 were 43.1%.

About 17% of men who were heavy drinkers in Wave 1 remained heavy drinkers in Wave 2.

Among women who were lifetime abstainers in Wave 1, 91.7% remained lifetime abstainers in Wave 2. Of the remaining 8.3% who were no longer abstainers in Wave 2, 4.0%, 2.1% and 2.1% became former, moderate and heavy users of alcohol correspondingly. Among female former users in Wave 1, 92.3% remained former users in Wave 2. The remaining 7.7% of former drinkers transitioned to the other categories, 4.8% became moderate users and 2.9% became heavy alcohol users. Among women who were moderate alcohol users in Wave 1, 65.2% did not indicate their current status of alcohol use in Wave 2, 10.7% became former users by Wave 2, 17.9% remained moderate users and 6.3% became heavy alcohol users. Among female heavy users of alcohol, seven out of ten did not indicate their current level of alcohol consumption in Wave 2, 6.7% and 13.3% transitioned to become former and moderate drinkers respectively while female respondents who remained heavy users were 10.0%.

Overall, by the end of the second Wave, more women remained abstainers and former alcohol users compared to men who transitioned to increased consumption of alcohol, by reporting 43.1% and 17.2% for moderate and heavy drinking. It is worthy to note that among both men and women, heavy users were more likely to transition from heavy use to moderate consumption rather than former use. The ever-use category comprise of respondents who indicated their alcohol use status in Wave 1 but did not indicate their alcohol use status in Wave 2.

Figure 4.3 Transition Probabilities between Alcohol Use Status among Men and Women



Source: Computed from WHO SAGE Survey Data; 2007 & 2014

4.7 Symptoms of Depression in Wave 1 and 2

The cross-sectional results of levels and changes in number of symptoms of depression in the total sample and males and females in Waves 1 and 2 are detailed in Figure 4.4. Counts of symptoms of depression ranged from 0 to 7 and were highly skewed at zero. In relation to the total sample, there was a 1.6% decrease in proportions who mentioned having no symptoms of depression, meaning that over time, more persons reported more counts of depressive symptoms. Proportions reporting between 1 and 5 symptoms of depression increased while there was a decline in proportions indicating 5 to 7 symptoms by Wave 2. The decrease was marginally higher among women (1.9%) than men (1.3%) meaning that a higher percentage of women reported more counts of symptoms by Wave 2. Reports of 2 to 7 symptoms of depression was higher among women than men in Wave 2.

Figure 4.4 Levels and Changes in Counts of Symptoms of Depression among the Total sample, Men and Women (2007 And 2014)

In assessing severity of depression, respondents were categorised as having no depression, minor and major depressive episodes as depicted in and Table 4.4. Persons were considered as having no depression when they reported no or 1 depressive symptom, a minor depressive episode (MiDE) when they reported 2 to 4 depressive symptoms and major depressive episode (MDE) when they reported 5 or more symptoms of depression as stipulated by DSM-IV diagnostic criteria for major depressive episode (APA, 2000). Similar to results on counts of symptoms indicating an increase in proportion of persons with more depressive symptoms, prevalence estimates of depression show that in Wave 2, there was a percentage increase of 100% and 21.2% of persons with either MDE or MiDE respectively. Gender differences in the results were noted. A higher percentage of men than women reported MiDE in Wave 1 while more women had MiDE in Wave 2. Further, a higher proportion of women (3.9%) had MDE in W1 while a higher percentage of men (4.1%) had MDE in Wave 2. Overall a higher proportion of women reported more counts of depressive symptoms (between 2 to 7 symptoms) in Waves 1 and 2 compared to men.

Table 4.4 Symptoms of Depression in Waves 1 and 2

Depression		Wave 1	Wave 2	Wave 1		Wave 2	
		Total Sample		Male	Female	Male	Female
Number of symptoms	0	95.2	92.5	95.5	94.9	93.2	91.5
	1	0.0	0.8	0.0	0.0	1.0	0.6
	2	0.0	0.6	0.0	0.0	0.4	0.9
	3	0.1	0.6	0.1	0.2	0.5	0.7
	4	1.4	1.6	1.7	1.0	0.9	2.6
	5	1.1	2.1	0.8	1.5	2.4	1.6
	6	1.5	1.4	1.2	1.7	1.4	1.5
	7	0.7	0.4	0.7	0.7	0.3	0.6
Prevalence	None[a]	1427 (95.2)	1399 (93.3)	740 (95.5)	687 (94.9)	730 (94.2)	667 (92.1)
	MiDE	23 (1.5)	41 (2.8)	14 (1.8)	9 (1.3)	13 (1.7)	31 (4.2)
	MDE	49 (3.3)	59 (3.9)	21 (2.8)	28 (3.9)	32 (4.1)	27 (3.7)

Source: Computed from WHO SAGE Survey Data; 2007 & 2014

[a]Persons with 0 and 1 count of depressive symptom were considered as belonging to the "None" category

Weighted estimates are shown

4.8 Variations in Symptoms of Depression between and within Individuals across Time

Descriptive statistics in this subsection provides estimates that take into account the panel structure of the data by linking the individual's information over the two time points. Table 4.5 summarizes changes in average depression scores of the panel over time and decomposes the variation into between respondents and within individual variation in counts of symptoms of depression.

Overall, the number of individuals were 1449, with each of the respondents having two observations (T) for wave 1 and 2 hence, 2998 observations. Respondents reported a mean of 0.4 symptoms indicating a high skew at zero. In the total sample, depression scores changed over time as within and between standard deviation were greater than zero. In describing individuals average change from the sample mean or from their own individual mean over time, the between and within standard deviation (1.15, 1.00) indicates almost similar variation in counts of depression symptoms of each participant and within an individual over time. However, comparing both variations, most variation occurred between, rather than within individuals. This means that most subjects during the study period had different mean count of symptoms of depression that is from fewer to more symptoms. Hence both cross-sectional and panel descriptives show an increase in symptoms

of depression among respondents between the two time points. Females reported higher average count of symptoms than men.

Table 4.5 Change in Counts of Depression between and within Individuals

Sample		Mean	Std. Dev.	Min	Max	Observations
Total Sample	Overall	0.39	1.49	0	7.0	N = 2998
	between		1.15	0	5.5	n = 1499
	Within		1.00	-3.1	3.9	T = 2
Male	Overall	0.36	1.43	0	7.0	N=1550
	between		1.03	0	5.0	n=775
	Within		0.98	-3.2	3.8	T=2
Female	Overall	0.51	1.57	0	7.0	N=1448
	between		1.27	0	5.5	n=724
	Within		1.02	-3.0	4.0	T=2

Source: Computed from WHO SAGE Survey Data; 2007 & 2014

4.9 Bivariate Tests of Associations between Alcohol use and Depression

As the outcome variable was not normally distributed[9], non-parametric bivariate analysis including Kruskal-Wallis H, Mann-Whitney *U* tests, was conducted to show the distribution of symptoms of depression across variable categories. In addition, the association between the variable categories and depression were assessed using these tests. The Spearman Rank Order tests highlighted the strength, direction and association between depression and continuous variables considered in the study.

The Kruskal-Wallis H Independent Samples Test, a non-parametric equivalent of ANOVA, estimates the significant difference in a scale (interval or ratio) or ordered dependent variable by a three or more category independent variable (Field, 2018; Hamilton, 2013; Pevalin & Robson, 2009). The Mann-Whitney *U* Independent Samples test, a non-parametric variant of the Independent Samples *t*-test, examines the significant difference in a scale or ordered dependent variable by a dichotomous independent variable (Pevalin & Robson, 2009; Hamilton, 2013; Field, 2018). Spearman Rank Order tests, a non-parametric version of Pearson's Correlation tests for correlations between two scale variables (Pevalin & Robson, 2009; Hamilton, 2013; Field, 2018; Akoglu, 2018).

[9] See Appendix B for results on the exploratory analysis of normality of the data

Table 4.6 shows bivariate statistics of non-parametric Kruskal-Wallis H, and Spearman Rank Order tests for the distribution of and correlation between alcohol use categories, previous week's alcohol use and symptoms of depression among men and women. Computing bivariate tests of associations between alcohol use status and symptoms of depression was not practicable for the total sample as men and women had different thresholds of standards of drinks constituting moderate and heavy consumption of alcohol (as indicated in Chapter 3). Therefore, analysis on alcohol use status was disaggregated by sex mainly to find out the differential influence of level of alcohol consumption on symptoms of depression among men and women. Bivariate tests of associations of the past week's counts of standard drinks consumption and depression symptoms counts were rather computed for the total sample and separately for men and women as the variable was count and not categorical which would have required analysis disaggregated by sex.

The null hypothesis for the Kruskal-Wallis H test is that the distribution of symptoms of depression is the same across categories of alcohol use. For men on the one hand and women on the other hand, there was no statistically significant relationship between their alcohol use and depressive symptoms in Waves 1 and 2 as $p>0.05$ hence the null hypothesis was retained. This indicates that abstaining from alcohol in one's lifetime, being a former user, moderately drinking are no more of a depressant than heavy drinking. Similarly, previous week's alcohol use was also not significantly related to depression in Waves 1 and 2 hence null hypothesis also retained.

Table 4.6 Kruskal-Wallis H Test and Spearman Rank Order Table of Distribution of Counts of Depression Symptoms across Alcohol Use Status and Counts of Standard Drinks of Alcohol

Variable	Wave 1						Wave 2					
	Male			Female			Male			Female		
	Ranked Mean	χ^2 /r_s	$^b\eta^2$	Ranked Mean	χ^2 /r_s	$^b\eta^2$	Ranked Mean	χ^2 /r_s	$^b\eta^2$	Ranked Mean	χ^2 /r_s	$^b\eta^2$
Alcohol use		3.01	0.005		5.16	0.007		4.56	0.005		0.813	0.03
Lifetime Abstainer	382.2			360.5			362.1			359.4		
Ever used	-	-	-	-	-	-	363.2			365.3		
Former drinker	392.3			374.7			379.5			367.4		
Moderate drinker	386.6			348.8			363.9			368.5		
Heavy drinker	402.3			353.2			362.1			339.6		
Count of standard drinks of alcohol		0.09	0.002		0.11	0.001		0.005	0.001		-0.01	0.000

Source: Computed from WHO SAGE Survey Data; 2007 & 2014

4.10 Bivariate Tests of Associations between Sociodemographic Characteristics and Symptoms of Depression

Table 4.7 presents summary statistics of non-parametric Kruskal-Wallis H, Mann-Whitney *U* and Spearman Rank Order tests for the distribution of and correlation between sociodemographic characteristics and symptoms of depression of men and women. Table D1 and D2 in Appendix D also shows bivariate results for the total sample. The ranked mean indicates the group with either the highest or lowest number of symptoms of depression (Field, 2018). The effect size assesses the strength of the relationship between the variables. Ranging from 0 and 1 it indicates the proportion of variance in the dependent variable explained by the independent variable (Field, 2018). The effect is considered as small when the eta squared (η^2 or r) =0.1, moderate when (η^2 or r) =0.3 and large when (η^2 or r) =0.5 (Cohen, 1988; 1992).

In Wave 1, among the total sample[10], the sociodemographic characteristics of respondents including age, sex, marital status, employment status, level of education, wealth quintile, and region of residence were related to the number of symptoms of depression reported. Concerning gender differences, for men, demographic characteristics were not related to the number of depressive symptoms. For women, marital status, religion, wealth quintile, and region of residence were related to counts of depressive symptoms.

In indicating the specific categories of respondents' sociodemographic characteristics that had the highest or the least number of depressive symptoms in the total sample[11] in Wave 1, the Mann-Whitney *U* and Kruskal Wallis test results of mean rank are reported. Results show that the number of symptoms of depression was greater for persons 50 years and above (mean rank=753.8, z=-2.21, $p<0.05$, r=0.004); for women (mean rank=762.6, z= -2.40, $p<0.05$, r=0.003); persons not currently married (mean rank=739.8,

[10] See Appendix D for bivariate results on the total sample
[11] See Appendix D for bivariate results on the total sample

z=-2.49 , p<0.05, r=0.004); individuals not currently working (mean rank=770.8, z=-1.99, p<0.05, r=0.003); persons with no education (mean rank=762.7, z=6.22, p<0.05, r=0.004); participants belonging to the middle wealth quintile (mean rank=772.9, z=9.86 , p<0.05, r=0.006); and respondents living in the Northern Region (mean rank=790.5, z=38.47, p<0.05, r=0.028). The effect of these characteristics on the number of symptoms of depression is small, as they are less than the 0.3 effect size threshold specification by Cohen (1988, 1992).

The gender-disaggregated results on associations between sociodemographic characteristics and depression for Wave 1 in Table 4.7 indicate that the counts of symptoms of depression increased for women who were not currently working (mean rank=375.7, z=-1.97 , p<0.05) were affiliated to the Traditional Religion (mean rank=407.4, z=9.72 , p<0.05), belonged to the middle wealth quintile (mean rank=380.0, z=12.26 , p<0.05) and resided in the Greater Accra Region (mean rank=400.7, z=31.89, p<0.001). Contrastingly, sociodemographic characteristics of men did not relate to their number of depressive symptoms in Wave 1.

In Wave 2, among the total sample gender, marital, employment status, religion and region of residence were related to number of depressive symptoms. Similar to Wave 1, being female (mean rank=764.5, z=.-2.56, p<0.05), not currently married (mean rank=772.7, z=-3.94, p<0.001), not currently working (mean rank=786.7, z=-5.13 , p<0.001) were associated with a higher number of depressive symptoms in Wave 2. Differently from Wave 1, having no religious affiliation (mean rank=861.6, z=21.92, p<0.001), and residing in the Volta Region (mean rank=816.2, z=31.90, p<0.001) increased one's risk of a high number of depressive symptoms in Wave 2.

The gender-specific analysis shows that among men, residing in the rural areas, not currently working, not having any religious affiliation, and residing in the Volta Region was

significantly related to symptoms of depression. These aforementioned characteristics increased the number of symptoms of depression in men in Wave 2. Similar to men, women who were not currently working, and not being affiliated to any religion increased their number of symptoms of depression. Differently from men, women who were not married currently reported higher symptoms of depression compared to their married counterparts. Another distinction between the genders was the higher mean rank of counts depressive symptoms in men who were not working (mean rank=404.2) nor had no religious affiliation (mean rank=437.4) compared to women within the same categories respectively (not currently working mean rank= 380.9; no religious affiliation mean rank=430.3). This means that the aforementioned characteristics negatively influenced counts of depression symptoms in men more than women. Overall, effect sizes (η^2 or r) were less than 0.1 indicating a small effect on the outcome variable by sociodemographic characteristics of the total sample on the one hand and men and women on the other hand in Wave 2.

Table 4.7 Kruskal-Wallis H, Mann-Whitney U and Spearman Rank Order Table of Distribution of Counts of Depression Symptoms across Sociodemographic Characteristics of Males and Females

Variable	Wave 1						Wave 2					
	Male			Female			Male			Female		
	Ranked Mean	[a]Z/ χ^2 /r_s	[b]η^2	Ranked Mean	[a]Z/ χ^2 /r_s	[b]η^2	Ranked Mean	[a]Z/ χ^2 /r_s	[b]η^2	Ranked Mean	[a]Z/ χ^2 /r_s	[b]η^2
Age Groups		-1.57	0.004		-1.49	0.004		-0.27	0.000		-0.11	0.000
Less than 50 years	373.8			344.6			384.3			360.3		
50+ years	389.8			364.4			388.3			362.6		
Marital Status		-0.59	0.001		-1.21	0.002		-1.64	0.002		-2.55*	0.008
Curr. not Married	393.0			365.7			400.2			368.1		
Currently Married	387.2			355.6			385.2			342.1		
Place of Residence		-0.163	0.000		-1.73	0.005		-1.96*	0.004		-0.24	0.000
Rural	388.4			368.5			393.1			363.4		
Urban	387.2			355			378.2			361.4		
Currently working		-0.03	0.000		-1.97*	0.007		-3.21**	0.016		-3.72***	0.012
No	387.7			375.7			404.2			380.9		
Yes	388.0			358.1			379.9			349.4		
Religion		2.08	0.004		9.72*	0.015		18.73***	0.026		11.6**	0.026
None	396.3			372.2			437.4			430.3		
Christian	384.4			359.2			382.6			362.9		
Islam	393.9			357.1			383.2			346.4		
Traditional Religion	392.9			407.4			430.4			343.4		
Level of Education		0.90	0.002		3.48	0.005		1.47	0.001		4.13	0.008
None	391.7			368.4			383.5			369.7		
Primary	387.3			356			387.3			351.1		
Secondary/higher	384.6			351.7			393.4			354.5		

Source: Computed from WHO SAGE Survey Data; 2007 & 2014

[a]Z-score for Mann-Whitney U/ χ^2= Chi-Square Test for Kruskal-Wallis H Test and r_s Spearman's Rank Correlation Coefficient

[b] Effect size estimates display Cohen's d for Independent Samples t-tests and Cramer's V for Chi-squared tests

Results display asymptotic significance where *** p<0.001, ** p<0.01, * p<0.05

Table 4.7 Kruskal-Wallis H, Mann-Whitney *U* and Spearman Rank Order Table of Distribution of Counts of Depression Symptoms across Sociodemographic Characteristics of Males and Females (continued)

Variable	Wave 1						Wave 2					
	Male			Female			Male			Female		
	Ranked Mean	[a]Z/ χ^2 /r_s	[b]η^2	Ranked Mean	[a]Z/ χ^2 /r_s	[b]η^2	Ranked Mean	[a]Z/ χ^2 /r_s	[b]η^2	Ranked Mean	[a]Z/ χ^2 /r_s	[b]η^2
Wealth Quintile		0.39	0.001		12.26*	0.017		5.02	0.005		1.23	0.002
Poorest	386.7			357.9			389.6			366.3		
Poor	390.6			350.9			396.5			367.9		
Middle	389.2			380.2			395.9			357.4		
Wealthy	389.0			370.4			376.9			358.9		
Wealthiest	385.0			345.3			382.1			368.3		
Region of residence		14.24	0.021	345.96	31.89***	0.046		26.06**	0.040		15.19	0.040
Ashanti	381.6			371.5			389.5			385.4		
Brong Ahafo	379.2			367.9			374.7			344.0		
Central Region	394.5			382.5			365.2			353.5		
Eastern region	405.5			343.9			374.0			355.5		
Greater Accra Region	384.6			400.7			380.1			361.8		
Northern Region	405.5			329.5			380.3			331.3		
Upper West [c]	365.5			329.5			404.3			353.4		
Upper East[c]	365.5			333.4			400.7			370.1		
Volta Region	381.7			390.8			435.0			383.2		
Western Region	392.6			346.0			390.4			357.9		

Source: Computed from WHO SAGE Survey Data; 2007 & 2014

[a]*Z-score for Mann-Whitney U/ χ^2= Chi-Square Test for Kruskal-Wallis H Test and r_s Spearman's Rank Correlation Coefficient*

[b] Effect size estimates display Cohen's d for Independent Samples t-tests and Cramer's V for Chi-squared tests

Results display asymptotic significance where *** p<0.001, ** p<0.01, * p<0.05

4.11 Bivariate Tests of Association between Household, Lifestyle, Food Insecurity, Health-related Factors and Counts of Depression Symptoms

Table 4.8 presents results of the Mann-Whitney *U,* Kruskal-Wallis H tests and Spearman Rank Correlation Coefficient, which highlight the relationship between, and distribution of symptoms of depression across respondents' household, lifestyle experience of food insecurity and health-related characteristics in Waves 1 and 2. Findings related to the total sample are presented first, followed by the gender-disaggregated results for both waves.

In the total sample of respondents, household financial situation and debt were significantly associated with depression in Wave 1 according to the Mann-Whitney *U* test conducted. Persons who indicated that their household financial situation was bad had higher mean rank (mean rank=760.0, z= -2.72, $p<0.01$) signifying a greater number of symptoms of depression. In addition, households who were currently having debts or unpaid loans reported more symptoms of depression (mean rank=779.7, z= -3.18, $p<0.01$). The Spearman rho results display a positive relationship between social capital and symptoms of depression in Wave 1, ($r_s=0.11$, $p<0.001$). That is, with high social capital, there was an increase in counts of symptoms of depression.

In the total sample of respondents, lifestyle and health-related factors significantly linked to increased counts of symptoms of depression in Wave 1 included, fruit and vegetable intake, chronic condition status, and medication use for any chronic condition and self-reported health. Levels of depression among adults who took less than 5 servings of fruit and vegetables daily (Mean rank=764.0, z= -4.20, $p<0.000$) differed significantly from those who took more servings daily (Mean rank=717.5, z= -4.20, $p<0.000$). This means that persons taking less than the WHO recommended daily servings of fruit and vegetables had higher counts of symptoms of depression compared to those who took the recommended

servings. The Spearman rho results display a positive relationship between the number of chronic conditions and symptoms of depression, (r_s=0.23, p<0.001). This means that with an increase in number of chronic conditions, the number of depressive symptoms increased. The average rank of counts of depression symptoms was higher for persons taking medication or treatment for any chronic condition (mean rank=827.5) compared to those who were not taking medication (mean rank=731.0), (z= -7.56, p<0.001). The Spearman's correlation coefficient showed a significant positive relationship between self-reported health and symptoms of depression in Wave 1, (r_s=0.17, p<0.001). This means that, though the strength of the relationship was weak, an increase in individuals' self-reported health which depicts worst self-reported health, increased their counts of symptoms of depression.

Dissimilar to Wave 1, social capital was inversely related to number of depressive symptoms (r_s=-.10, p<0.001). This means that with an increase in social capital scores number of symptoms of depression decreased in the total sample in Wave 2. In addition, experiencing food insecurity, that is, ever being hungry without money for food was significantly related to counts of symptoms of depression (mean rank=787.3, z= -3.15, p<0.01).

Results for the gender-specific analysis showed gender differences in the relationship between household, food insecurity, lifestyle and health-related factors and counts of symptoms of depression in Wave 1. The influence of social capital, tobacco use and self-reported health on number of depressive symptoms was similar among men and women. Increased scores of social capital increased number of symptoms of depression with the positive spearman coefficient being slightly higher for women (r_s=0.14 versus r_s=0.11). Men and women who had ever used tobacco had increased counts of symptoms of depression. Likewise, poor self-rated health increased number of symptoms in both genders. Among men having a bad household financial situation (mean rank=393.7, z= -2.32, p<0.05) or having debts or unpaid loans (mean rank=407.8, z= -3.26, p<0.01),

symptoms of depression were higher compared to their counterparts whose financial situation was good or who did not have debts. Males who specified taking treatment or medication for any chronic condition including antidepressants and injuries had higher average ranks of counts of depressive symptoms (mean rank=439.4, $z=6.62$, $p<0.001$). Females reporting taking less than 5 servings of fruit and vegetables a day had higher mean ranks of depressive symptoms (mean rank=375.1, $z=-4.76$, $p<0.001$) compared to their counterparts who took more servings a day.

The second wave's findings on the gender-specific relationship between food insecurity and self-reported health showed similar results among men on the one hand and women on the other hand. Men and women who were food insecure in the year prior to Wave 2 and those who reported higher scores of self-reported health had increased counts of symptoms of depression. Distinctly, women with higher scores of social capital had lower counts of depressive symptoms ($r_s= -0.11$, $p<0.01$). This finding was also dissimilar to the positive relationship between social capital and depression in Wave 1.

Table 4.8 Kruskal-Wallis H, Mann-Whitney U and Spearman Rank Order Table of Distribution of Counts of Depression Symptoms across Community and Household Factors of Males and Females

Variable	Wave 1						Wave 2					
	Male			Female			Male			Female		
	Ranked Mean	[a]Z/ χ^2 /r_s	[b]η^2	Ranked Mean	[a]Z/ χ^2 /r_s	[b]η^2	Ranked Mean	[a]Z/ χ^2 /r_s	[b]η^2	Ranked Mean	[a]Z/ χ^2 /r_s	[b]η^2
HH Financial Situation		-2.32*	0.007		-1.49	0.003		-0.77	0.003		-1.26	0.006
Bad	393.7			366.5			391.3			368.3		
Good	377.9			354.1			385.7			357.7		
HH Debt		-3.26**	0.013		-1.38	0.002		-0.95	0.000		-1.07	0.004
No	382.3			359.6			388.9			361.1		
Yes	407.8			372.3			375.5			376.9		
Food Insecurity		-0.15	0.000		-1.16	0.002		-2.81**	0.016		-2.02*	0.017
Never	388.3			359.65			382.9			358.9		
Ever	387.2			369.61			407.8			382.5		
Social Capital[c]		0.11**	0.011		0.14**	0.029		-0.059	0.001		-0.11**	0.007
Lifestyle Factors												
Tobacco use		-2.00*	0.006		-2.05*	0.008		-0.19	0.000		-0.10	0.003
No	382.8			360.4			388.6			361.3		
Yes	396.1			392.7			387.2			376.9		
Physical Activity		-0.11	0.000		-1.43	0.004		-0.40	0.000		-1.56	0.002
Inactive	386.9			350			390.2			370.4		
Active	388.1			365			387.1			357.2		
Diet		-0.91	0.002		-4.76***	0.031		-1.10	0.000		-0.30	0.001
Unhealthy	390			375.1			384.2			361.4		
Healthy	383			335.5			392			363.9		

Source: Computed from WHO SAGE Survey Data; 2007 & 2014

[c] Standardised social capital score ranges from 0 to 100. Higher scores indicate high social capital and lower scores indicate low social capital

Table 4.8 Kruskal-Wallis H, Mann-Whitney U and Spearman Rank Order Table of Distribution of Counts of Depression Symptoms across Community and Household Factors of Males and Females (continued)

Variable	Wave 1						Wave 2					
	Male			Female			Male			Female		
	Ranked Mean	[a]Z/ χ^2 /r_s	[b]η^2	Ranked Mean	[a]Z/ χ^2 /r_s	[b]η^2	Ranked Mean	[a]Z/ χ^2 /r_s	[b]η^2	Ranked Mean	[a]Z/ χ^2 /r_s	[b]η^2
Lifestyle Factors												
BMI			0.003		5.08	0.006		3.03	0.002		1.91	0.001
Underweight	383.9			376.6			384.42			349.8		
Normal	380.7			354.8			371.7			337.7		
Overweight	374.3			356.3			365.2			334.2		
Obese	400.3			345.9			362.4			331.5		
Physical Health												
Chronic Condition(s)		0.23***	0.066		0.21***	0.046		0.03	0.000		0.062	0.007
Medication use		6.62***	0.060		-4.16	0.026		-0.01	0.000		-1.64	0.003
No	378.9			353.3			388			361.5		
Yes	439.4			390.7			388.4			399.8		
Injury		-1.29	0.002		-0.7	0.001		-0.91	0.000		-0.61	0.001
No	389.2			363.3			388.9			362		
Yes	372.7			353.4			375.9			374.9		
Self-Reported Health[d]		0.16***	0.028		0.16***	0.029		0.22***	0.060		0.30***	0.130

Source: Computed from WHO SAGE Survey Data; 2007 & 2014

[a]*Z-score for Mann-Whitney U/ χ^2= Chi-Square Test for Kruskal-Wallis H Test and r_s Spearman's Rank Correlation Coefficient*

[b]Effect size estimates display Cohen's d for Independent Samples *t*-tests and Cramer's V for Chi-squared tests

[d]Standardised score of self-reported health score ranges from 0 to 100: Higher scores indicate worse health and lower scores indicate best health

Results display asymptotic significance where *** p<0.001, ** p<0.01, * p<0.05

4.12 Discussion

There is inadequate knowledge on recent trends of alcohol use and depression and the associations between them in limited resource contexts, including Ghana. In line with Objective 1, this chapter described the total sample and gender-specific characteristics, levels, changes in alcohol use, and symptoms of depression in Waves 1 and 2 at the univariate level. At the bivariate level, the association and distribution of counts of symptoms of depression across the characteristics of all respondents and separately for the genders were assessed.

The univariate cross-sectional descriptive results on sociodemographic and household characteristics showed that proportions of the married, employed, individuals affiliated to the Islamic Religion as well as individuals living in the rural areas declined. Household financial situation improved, social capital increased and fewer households indicated having unpaid loans or debts by Wave 2. Dissimilar to the most recent (2010) Ghana Population and Housing Census, this study found a decline in the proportion of respondents who were currently employed (G. S. Service, 2012). This could be because a high proportion of the sample were above functional age hence may not be able to work. In addition, the finding of the slightly increased proportion of respondents living in the urban areas by Wave 2 was not due to persons migrating to urban areas but that the communities they were living in became urbanised between the 2 waves. This result affirms the 2010 Ghana Population and Housing Census report of increased urbanisation with over half of Ghanaians living in urban areas (G. S. Service, 2012).

In relation to lifestyle behaviour, heath-related characteristics of the total sample over the 2 waves, self-reported health improved, there was an increase in proportions who had ever used tobacco, who were physically inactive, proportions consuming the recommended five servings of fruit and vegetables a day and proportions underweight. Despite an increase in the average number of chronic conditions, medication use, including

antidepressants or treatment for chronic conditions or injuries declined. It is possible that since there was a decline in accident or violence-related injuries by Wave 2 there was no need for injury related treatment. This could also be an issue of medication non-adherence. Atinga, Yarney, & Gavu (2018) explain in their qualitative study of medication non-compliance among diabetes and hypertensive patients in Ghana that non-adherence was as a result of views that orthodox medicines were not efficient for managing the chronic conditions hence resort to alternative traditional herbal medicines and spiritual healing. They identified other factors for non-adherence as busy work schedules, social norms and poor prescription instruction. Semahegn et al., (2018) affirm in their systematic review of literature that non-adherence to antidepressants is influenced by patients' perceptions about side effects. The univariate descriptive results also showed significant gender differences in the sociodemographic, household, other lifestyle and health-related characteristics.

Both cross-sectional and panel univariate descriptive results showed a decline in proportions of lifetime abstainers, moderate and heavy drinkers and an increase in former use of alcohol among the total sample. Despite the decline in alcohol use, gender-specific results showed that there were more female lifetime abstainers and former drinkers and fewer moderate and heavy drinkers compared to men. Despite the decline in, and lower levels of alcohol use by women, percentage decline in heavy use of alcohol by men was higher. All these mean that alcohol initiation, use (moderate and heavy) and discontinuation were higher among men compared to women over the two time points. Cross-sectional and longitudinal studies have confirmed higher consumption of alcohol by men (Paschall et al., 2005; Rehm et al., 2009; Gea et al., 2013). Contrastingly, Paschall et al. (2005), reported a higher proportion of female than male moderate drinkers among their study sample from the United States (US). Also, whether male or female, respondents in the study reported a higher prevalence of alcohol consumption compared to this study's sample, further corroborating recent global study findings that, the prevalence of alcohol consumption is

higher (whether among men or women) in HICs relative to LMICs (Rehm et al., 2009; Griswold et al., 2018). Notably, the panel descriptive results in addition to affirming findings from the cross-sectional descriptives further revealed that for both men and women, a higher proportion of former, moderate or heavy drinkers transitioned to or remained moderate or heavy users. This means that having ever consumed alcohol precipitated one to either remain using (moderately or heavily) or use and stop using between the waves. The finding of consistent alcohol use over time among ever users of alcohol in the sample could be explained by the addiction theory of tolerance which indicates that sensitivity to alcohol's intoxicating effects reduces with repeated consumption hence individuals tend to consume larger quantities of alcohol over time (Radlow, 1994).

Cross-sectional and panel descriptives on counts of symptoms of depression showed slight variations in counts of depression across the sample and within individuals over time. Among the total sample, there was a slight decline in participants who reported a zero count (no depression) of depressive symptom and an increase in respondents with MiDE and MDE. Prevalence of MiDE was higher among women while men reported a higher prevalence of MDE in Wave 2. Longitudinal descriptives show that women reported higher average count of symptoms than men. Gender differences in depression which begins from adolescence through to adulthood have been explained by biological, psychological and sociocultural factors (Hankin & Abramson, 2001; DeRose et al., 2006; Girgus & Nolen-Hoeksema, 2006; Boughton & Street, 2007; Johnson & Whisman, 2013). Biological explanations proffered by Girgus and Nolen-Hoeksema (2006) attribute the gender difference in prevalence of depression to puberty where adolescent girls begin to exhibit a higher prevalence of depression compared to boys. During puberty, the different levels of hormones cause girls to be more vulnerable to stress, as they are emotionally reactive to relational and environmental sources of stress. Socialising girls to be more affiliative is also a source of stress during interpersonal relationship strain. Psychological and sociocultural

explanations include negative self-esteem due to body image, feminine gender role orientation, ruminating personality, being caring for others, affiliative among others (Hankin & Abramson, 2001; DeRose et al., 2006; Boughton & Street, 2007; Johnson & Whisman, 2013).

According to the bivariate results, there was no statistically significant relationship between alcohol use status, standard drinks consumed and counts of symptoms of depression in both Waves 1 and 2. In explaining this finding, it is possible that since the bivariate analysis examines the gross relationship between alcohol use and depression, other factors may be required to be controlled for in multivariate analysis for the relationship to be significant. In other words, alcohol use on its own may not significantly be linked to number of depressive symptoms among the sample studied. This observation is indicated as suppression effects by some literature, which illustrate that the removal of a confounding effect by adding more confounding variables in a model increases the predictive validity of the independent variable (MacKinnon et al., 2000; Lenz & Sahn, 2017; Kim, 2019).

Sociodemographic, lifestyle and health-related factors that have consistently (both Waves 1 and 2) been associated with counts of symptoms of depression comprise of sex, marital status, employment status, region of residence, social capital, number of chronic conditions and self-reported health. Specifically, women, persons not married, not employed, those residing in the Northern Region for Wave 1 and Volta Region for Wave 2, individuals with higher self-reported health scores and number of chronic conditions reported higher average rank of counts of symptoms of depression compared to their counterparts. Cross-sectional and panel surveys have confirmed the aforementioned sociodemographic and lifestyle and health-related factors as being linked to depression (Paschall et al., 2005; Tsai et al., 2013; Tsai et al., 2016; Churchill & Farrell, 2017; Shore et al., 2017; Bajunirwe et al., 2018).

High levels of social capital were related to higher counts of symptoms of

depression in Wave 1 while the reverse, was true for Wave 2. Several studies have highlighted the presence of social networks and participating in community group activities as protective against depression as they served as buffers to cope with and mitigate the effects of depression (WHO, 2014; Tsai et al., 2016). Despite these, Adams and Dzokoto (2003) indicated contrasting findings, positing that, it is rather the quality of support derived from one's social capital, which inures to the benefit of the individual and not the quantity. Further, these heightened social interactions in Wave 2 could be sources of strain with women being more emotionally involved in social interactions. They become vulnerable to challenging interpersonal relationships compared to men (Boughton & Street, 2007).

CHAPTER FIVE

CROSS-SECTIONAL ASSOCIATIONS BETWEEN ALCOHOL USE AND DEPRESSION IN GHANA

5.1 Introduction

In accordance with the second objective of this study, this chapter presents results of cross-sectional multivariate tests of associations between adult's consumption of alcohol and its influence on depression evidenced by number of symptoms present in Waves 1 and 2. Factors controlled for include, sociodemographic characteristics[12], household, lifestyle and health-related factors of adults in Ghana. The utility of this chapter is that, to better understand, explain and predict the relationship, there is the need to examine the net influence of individuals alcohol use status on their counts of symptoms of depression cross-sectionally thus building up on the previous chapter.

5.2 Cross-sectional Associations between Alcohol use and Depression among Adults in Ghana

To assess the relationship between alcohol consumption and depression, regression models for the Poisson, Negative Binomial (NB), Zero-inflated Poisson (ZIP) and Zero-Inflated Negative Binomial Model (ZINB), were fitted as the outcome variable was counts of symptoms of depression and had a highly skewed distribution. The goodness-of-fit tests[13] such as AIC, BIC, likelihood-ratio and other graphical methods showed the ZIP model to be best fitting to produce reliable estimates for Waves 1 and 2 respectively. The ZIP model accounts for the high proportion of zeros in the outcome variable by dividing it into 2, the count and binary parts and predicting membership in the two parts. The count part (not always zero group), assumes individuals in the group have a probability of a positive count

[12] The BMI variable was excluded from the regression models because there were a large proportion of missing responses and region of residence was excluded due to 0 cells all of which could bias regression estimates

[13] See Appendix C (Table C2) for further details on the goodness-of-fit statistics AIC, BIC for Poisson, NB, ZIP, and ZINB as well as the selection criteria of the best fitting (appropriate) models

for instance, some respondents would eventually be depressed. The binary part (always zero group) assumes the probability of having a positive count is always zero (Long & Freese, 2014; Xu et al., 2017), that is respondents belonging to the group are not depressed and cannot be depressed e.g. due to genetic dispositions.

For this study, ZIP model fitted assumed that the probability of an individual belonging to the binary (always zero) group is not constant, meaning that some variables predict significantly the probability of belonging to the not depressed group than others. The probability is represented by the "inflate" variable chronic condition (s) at the bottom of Table 5.1. Unweighted estimates are presented after DuMouchel and Duncan (1983) F-test showed a non-significant difference between weighted and unweighted regression estimates meaning that findings would not differ whether weights are applied or not. In addition, both models fitted were estimated with robust standard errors to avoid biased parameter estimates and inconsistent standard errors (Rao & Miller, 2011).

Table 5.1 presents the models for the ZIP, which assess the relationship between alcohol use and depression in Wave 1 and Wave 2 among adults in Ghana. The columns show the exponentiated coefficients, that is the Incidence Rate Ratio (IRR) and the confidence interval of men and women first for Wave 1 and second, for Wave 2 ZIP models. The IRR expresses the factor change in the rate at which the outcome occurs as a result of a unit increase or decrease in the explanatory variable (Long & Freese, 2014). The likelihood ratio test for both models were statistically significant ($p<0.001$) meaning that at least one of the variables in the model predicted the number of symptoms of depression among adults.

5.2.1 Alcohol Use and Depression (Wave 1)

Alcohol consumption status significantly predicted depression in Wave 1 when other predictors were held constant. Statistically significant control characteristics of men, which predicted depression symptoms, included age, level of education, employment status, medication use, place of residence, wealth quintile and number of chronic conditions.

Similar to men, women's alcohol use status, employment status, place of residence, wealth quintile and number of chronic conditions in Wave 1 were linked to rates of symptoms of depression. Unlike men, women's level of social capital and financial situation predicted depression symptoms.

With respect to alcohol use, men who were former (IRR=1.551; $p<0.001$), moderate (IRR=1.638; $p<0.001$) and heavy drinkers (IRR=1.702; $p<0.001$) and women who were heavy drinkers (IRR=1.488; $p<0.05$) were more likely to indicate increased rates of depression compared to lifetime abstainers. Hence, the incidence of depressive symptoms increased with high levels of consumption of alcohol. Incidence rates of depression among men 50 years and above more than doubled (IRR=2.309; $p<0.05$) compared to those below in the first Wave. Males who had received treatment, or were using medication for injuries or chronic conditions also stated a 28% increase in depression rates. Males living in the rural areas had 1.358 times higher rates of symptoms of depression (IRR=1.358; $p<0.05$) compared to their urban counterparts whereas women residing in the rural areas reported about 14% fewer symptoms of depression (IRR=0.865; $p<0.05$) relative to women in the urban areas. Males with secondary or higher level of education reported about 14% fewer symptoms than those with no education. Among both men and women who were currently working, incidence rates of depression decreased by about 35% and 15% correspondingly relative to those not working. Pertaining to men, belonging to the middle, rich and richest wealth quintiles decreased incidence rates of number of depression symptoms by 38%, 19% and 22% respectively and only women who belonged to the poor quintile decreased incidence rates of counts of depression symptoms by 17%. Also, living with one or more chronic conditions increased one's likelihood of experiencing more symptoms of depression compared to not having any chronic condition (IRR=5.204; $p<0.01$). The results show that a unit increase in social capital was associated with a 0.7% increase in the incidence rate of symptoms of depression (IRR=1.007; $p<0.001$). This means, an increased community

involvement, trust in others and safety in the community worsened women's mental health. Again, women belonging to households with good financial situation decreased the incidence rate of depression by 15%.

5.2.2 Alcohol Use and Depression (Wave 2)

The ZIP Wave 2 model presented in Table 5.1 shows no statistically significant relationship between alcohol consumption and number of depression symptoms among men and women when all other predictors were held constant.

Other variables included in the model, which were significantly associated with symptoms of depression among men comprised of level of education, religious affiliation, injury status, food insecurity, self-reported health and household debt. Similarly, among women, injury status, food insecurity and self-reported health predicted number of symptoms of depression. Distinguished from men, age of women was linked to depressive symptoms. Unlike Wave 1, men with basic, secondary or higher levels of education had a double (IRR=2.343; $p<0.05$) and triple (IRR=3.094; $p<0.01$) incidence rate of depression in Wave 2. Males belonging to the Traditional Religion, or reporting household debt and unpaid loans had a two (IRR=2.511; $p<0.05$) and a fourfold (IRR=4.408; $p<0.01$) increase in incidence rate of depression respectively. While experiencing an accident or violence-related injury decreased the incidence rate by about 75% among men (IRR=0.254; $p<0.05$), women had an increased rate of counts of symptoms by 76% (IRR=1.763; $p<0.05$). Having ever been hungry without money to buy food increased the incidence rate of depressive symptoms in men by 71% (IRR=2.711; $p<0.01$) and in women by 50% (IRR=1.505; $p<0.01$). A unit increase in self-reported health increased incidence rates of depression by 4% (IRR=1.042; $p<0.001$) in men and 2% (IRR=1.023; $p<0.01$) in women.

Table 5.1 Cross-Sectional Zero-Inflated Poisson Regression Models of the Relationship between Alcohol Use Status and Depression in Wave 1 and 2

Variable	Wave 1				Wave 2			
	Men		Women		Men		Women	
	IRR	95% CI	IRR	95% CI	IRR	95% CI	IRR	95% CI
Alcohol use								
Lifetime abstainer	1		1		1		1	
[I]Ever user	-	-	-	-	0.545	[0.219,1.356]	1.155	[0.831,1.606]
Former drinker	1.551***	[1.251,1.924]	0.991	[0.878,1.119]	0.896	[0.354,2.267]	1.174	[0.872,1.579]
Moderate drinker	1.638***	[1.310,2.049]	0.880	[0.722,1.071]	1.001	[0.430,2.327]	0.871	[0.570,1.331]
Heavy drinker	1.702***	[1.320,2.196]	1.488*	[1.049,2.111]	1.078	[0.426,2.728]	1.417	[0.583,3.448]
Age								
Less than 50yrs	1		1		1		1	
50yrs and above	2.309***	[1.426,3.737]	1.163	[0.885,1.529]	0.602	[0.223,1.629]	0.490*	[0.243,0.988]
Marital Status								
Not currently Married	1		1		1		1	
Currently Married/Living	1.011	[0.880,1.162]	1.002	[0.888,1.130]	0.639	[0.293,1.391]	0.589	[0.347,1.001]
Together								
Level of Education								
None	1		1		1		1	
Basic School	1.098	[0.905,1.332]	1.014	[0.880,1.170]	2.343*	[1.190,4.610]	0.906	[0.567,1.450]
Secondary/Higher	0.863*	[0.747,0.997]	1.051	[0.816,1.355]	3.094**	[1.393,6.872]	0.929	[0.572,1.509]
Religion								
None	1		1		1		1	
Christianity	0.884	[0.745,1.048]	0.934	[0.735,1.187]	1.002	[0.392,2.563]	1.178	[0.564,2.460]
Islam	0.923	[0.765,1.115]	1.131	[0.893,1.432]	2.479	[0.916,6.706]	1.614	[0.734,3.547]
Traditional	0.849	[0.698,1.032]	0.973	[0.767,1.235]	2.511*	[1.006,6.264]	3.419	[1.130,10.344]

Source: Computed from WHO SAGE Survey Data; 2007 & 2014

Exponentiated coefficients; 95% confidence intervals in brackets; Coefficients for constants are not exponentiated

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

[I]Ever users of alcohol in Wave 1 who did not indicate their alcohol use status in Wave 2 were included in the model as ever using alcohol could influence one's mental health.

Unweighted estimates are reported

Table 5.1 1 Cross-sectional Zero-Inflated Poisson Regression Models of the Relationship between Alcohol Use Status and Depression in Wave 1 and 2 (continued)

Variable	Wave 1				Wave 2			
	Men		Women		Men		Women	
	IRR	95% CI	IRR	95% CI	IRR	95% CI	IRR	95% CI
Employment Status								
Not currently working	1		1		1		1	[1,1]
Currently working	0.652**	[0.499,0.851]	0.843**	[0.754,0.941]	0.788	[0.478,1.297]	1.207	[0.866,1.682]
Diet								
Unhealthy Diet	1		1		1		1	[1,1]
Healthy Diet	1.111	[0.962,1.283]	0.912	[0.647,1.286]	0.969	[0.539,1.742]	0.827	[0.538,1.272]
Tobacco use								
Never used	1		1		1		1	[1,1]
Ever used	1.048	[0.938,1.170]	1.074	[0.934,1.236]	1.005	[0.584,1.730]	1.089	[0.703,1.686]
Chronic Condition(s)	0.939	[0.832,1.060]	1.056	[0.998,1.118]	1.139	[0.624,2.078]	0.949	[0.707,1.274]
Injuries								
No	1		1		1		1	[1,1]
Yes	0.798	[0.560,1.137]	0.782	[0.552,1.108]	0.254*	[0.0880,0.733]	1.763*	[1.069,2.907]
Medication use								
No	1		1		1		1	[1,1]
Yes	1.282*	[1.049,1.568]	0.942	[0.855,1.037]	0.584	[0.0957,3.568]	1.198	[0.634,2.263]
Food insecurity/Hunger								
Never	1		1		1		1	[1,1]
Ever	0.890	[0.787,1.005]	0.972	[0.854,1.106]	2.711**	[1.465,5.018]	1.505**	[1.109,2.041]
Physical Act.								
Inactive	1		1		1		1	[1,1]
Active	1.075	[0.842,1.372]	1.163	[0.924,1.463]	1.211	[0.700,2.096]	1.762	[0.982,3.161]
Self-reported health	1.003	[1.000,1.007]	1.001	[0.997,1.005]	1.042***	[1.024,1.061]	1.023**	[1.008,1.039]
Social Capital	1.002	[1.000,1.005]	1.007***	[1.003,1.011]	1.012	[0.993,1.030]	0.996	[0.987,1.005]

Source: Computed from WHO SAGE Survey Data; 2007 & 2014

Exponentiated coefficients; 95% confidence intervals in brackets; Coefficients for constants are not exponentiated

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 5.1 Cross-sectional Zero-Inflated Poisson Regression Models of the Relationship between Alcohol Use Status and Depression in Wave 1 and 2 (continued)

Variable	Wave 1				Wave 2			
	Men		Women		Men		Women	
	IRR	95% CI	IRR	95% CI	IRR	95% CI	IRR	95% CI
HH Fin. Situation								
Bad	1		1		1		1	[1,1]
Good	0.906	[0.769,1.066]	0.849*	[0.744,0.969]	0.978	[0.579,1.651]	1.034	[0.552,1.937]
HH Debt								
No	1		1		1		1	[1,1]
Yes	1.042	[0.955,1.138]	0.942	[0.832,1.066]	4.408**	[1.631,11.92]	1.394	[0.780,2.491]
Place of residence								
Urban	1		1		1		1	[1,1]
Rural	1.358**	[1.120,1.647]	0.865*	[0.750,0.998]	0.832	[0.406,1.705]	0.896	[0.644,1.246]
Wealth Quintile								
Poorest	1		1		1		1	[1,1]
Poor	0.901	[0.762,1.066]	0.844	[0.697,1.020]	0.970	[0.400,2.351]	0.970	[0.689,2.142]
Middle	0.625**	[0.466,0.839]	0.826*	[0.712,0.959]	0.702	[0.294,1.680]	1.330	[0.819,2.160]
Rich	0.806*	[0.664,0.979]	0.851	[0.716,1.011]	2.729	[0.888,8.386]	1.669	[0.970,2.871]
Richest	0.781*	[0.622,0.980]	1.045	[0.816,1.338]	0.970	[0.400,2.351]	1.482	[0.677,3.245]
inflate								
Chronic condition (s)	0.286***	[0.192,0.428]	0.400***	[0.288,0.554]	0.860	[0.512,1.447]	0.748	[0.523,1.069]
No. of observations	775		724		775		724	
Model fit statistics								
AIC	532.6		717.8		626.6		818.4	
BIC	672.2		855.4		770.8		960.6	
Log likelihood	-236.3		-328.9		-282.3		-378.2	
Chi^2	183.6		108.1		186.6		164.6	

Source: Computed from WHO SAGE Survey Data; 2007 & 2014

Exponentiated coefficients; 95% confidence intervals in brackets; Coefficients for constants are not exponentiated

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

[a] *Standardised score of self-reported health: Higher scores indicate worse health and lower scores indicate best health*

[b] *Standardised social capital score: Higher scores indicate high social capital and lower scores indicate low social capital*

5.3 Discussion

Studies examining cross-sectional gender differences in the influence of alcohol consumption on depressive symptoms in developing contexts are limited. This study presented results on objective two which aimed at assessing the cross-sectional multivariate associations between consumption of alcohol and depression in Waves 1 and 2 among males and females in Ghana. It was hypothesized that first, male heavy alcohol users were more likely to have poorer mental health compared to lifetime abstainers. Second, moderate alcohol users were more likely to have better mental health compared to lifetime abstainers. From the cross-sectional results, men who were former, moderate and heavy drinkers and women who were heavy drinkers had higher counts of symptoms of depression compared to lifetime abstainers in Wave 1. Hence, the hypothesis that male heavy alcohol users were more likely to have poorer mental health compared to male abstainers was accepted. Several studies have confirmed this finding (Boschloo et al., 2012; Bellos et al., 2013; Gea et al., 2013; Mason, 2013; Thapa et al., 2015; Churchill & Farrell, 2017; Collins et al., 2018).

The second hypothesis was not accepted as male moderate drinkers had higher odds of poor mental health compared to male lifetime abstainers. While some studies have also corroborated moderate use of alcohol as a risk factor for depression (Paschall et al., 2005; Topiwala et al., 2017), others have reported contrasting results showing moderate alcohol use as protective of depression (Lipton, 1994; Chick, 1999; Bellos et al., 2013; Gea et al., 2013).

Given that these mixed findings have mainly stemmed from cross-sectional studies more longitudinal studies are required to ascertain the progression of depression among moderate users of alcohol over time as well as direction of causality. In addition, most of these studies focused on populations that predominantly consume wine along with a Mediterranean diet, noted to account for the protective effects. In limited resource settings including SSA countries where, as a result of poverty and food insecurity, persons might

moderately drink alcohol on an empty stomach which could be harmful. This could account for moderate alcohol consumption being a risk factor for higher counts of depressive symptoms. In Wave 2 however, there was no statistically significant relationship between alcohol consumption status and depressive symptoms among men and women.

Among men, factors that were protective against depression in Wave 1 were having a secondary or higher level of education, being currently employed and belonging to the middle, rich or richest wealth quintile. Bauldry's (2015) study affirms the protective influence of men's higher education level against depression. Further, Kendler and Gardner's (2014) co-twin study supports findings of a statistically significant relationship between wealth quintile and employment status of men on depressive symptoms in this study by revealing that stressful life events relating to finance and occupation had a particularly strong influence on depression in men compared to females. Living in the rural areas was a significant depression risk factor among men in Wave 1. A recent longitudinal cohort study in England has shown similar results by finding a statistically significant relationship between area deprivation and depression with men living in deprived areas being 51% more likely to be depressed compared to those in non-deprived contexts (Remes et al., 2019).

Among women, protective factors against depression included socioeconomic status indicators such as being currently employed, belonging to a household with a good financial situation, living in the rural areas and belonging to the poor wealth quintile.

Different from prevailing evidence on women with higher socioeconomic backgrounds reporting fewer symptoms of depression (Williams et al., 2013), this study found women belonging to the poor wealth quintile having lower counts of symptoms of depression. To explain this finding, from the descriptive statistics in Chapter 4, though most of the women indicated they belonged to households with bad financial status and were living in the rural areas, they were better off as majority were currently employed and had

never been hungry without money to buy food. Therefore, they were not abjectly poor accounting for their lower number of depressive symptoms. This highlights the importance of utilizing various socioeconomic indicators to better understand and explain the complex interactions between socioeconomic status and mental health. Social capital of women contributed to an increased risk of depression. Research evidence explain social capital as increasing women's risk of depression in terms of gender differences in giving and receiving support which could result in strains in roles and social relations as well as gender-related economic and social inequalities (Kawachi & Berkman, 2001; Almedom, 2005). Kendler and Gardner (2014) in their study of opposite sex twins add that women tend to be more intimate and emotionally involved with their social networks and are differently affected by adverse events in their social relationships.

Having ever been hungry without money to buy food increased the incidence rate of depressive symptoms in men compared to women in Wave 2. The higher counts of symptoms of depression among men is supported by an opposite twin pair research which shows men being more sensitive to economic stressors than women (Kendler & Gardner, 2014).

In Wave 2, older women were less likely to have higher counts of depression compared to younger women. This has been affirmed by Penninx (2006) who using data from a longitudinal study on aging in Amsterdam demonstrates that, major depression slightly declines among older persons between 55 and 85 years. Women with worse self-reported health had higher counts of symptoms of depression. This finding has been supported by a cohort study of low-income women in the United States (Watson et al., 2012).

CHAPTER SIX

ALCOHOL USE AND DEPRESSION IN GHANA: A PANEL BIDIRECTIONAL ANALYSIS

6.1 Introduction

Results on the long-term relationship between alcohol use and depression in Ghana using Waves 1 and 2 of the WHO SAGE data are presented in this section. This analysis explored the panel structure of the data, using the random-effects Poisson panel regression model to first examine the relationship between alcohol use status and counts of symptoms of depression of men and women over time. A second model was used to assess the direction of the relationship. It examined whether there was a unidirectional relationship, that is, whether number of standard drinks of alcohol predicted counts of depression symptoms or vice versa or a bidirectional relationship, that is, whether alcohol use predicted counts of depression symptoms and vice versa over time.

Sociodemographic characteristics, individual and household stressful life events, social capital, health-related factors and year effects were adjusted for in the panel models. Consequently, results in this section, which is a build-up on the previous chapter, provides crucial information on whether there exists a time-consistent relationship between both variables. By this it, contributes additional information and overcomes limitations specific to analysing cross-sectional data.

6.2 Longitudinal Analysis of the Association between Alcohol Use Status and Depression

Table 6.1 depicts the incidence rate ratio estimates of an adjusted random effects Poisson panel regression model, which considers the long-term relationship between alcohol use status and number of symptoms of depression of men and women. According to Wooldridge (1999) and Silva and Tenreyro (2006), the Poisson model for panel data is

robust as it yields consistent estimates in situations where there are different patterns of heteroscedasticity and a high proportion of zeros. The random effects Poisson model was specified after conducting the Hausman endogeneity test. Compared to the fixed effects model, the random effects model has the advantage of estimating the effect of both time variant and invariant explanatory variables. Overall, the model presented is important for predicting counts of symptoms of depression as the likelihood ratio chi-squared statistic is significant ($p<0.001$).

Over time, there was a statistically significant relationship between alcohol use status and mental health, that is, alcohol use status predicted the number of symptoms of depression of men and women in Ghana when all other predictors were held constant. Among both men and women, significant control factors included religious affiliation, treatment or medication use, self-reported health wealth quintile and the survey year. Among men only, marital status, level of education, injury, food insecurity, household financial situation, and place of residence was significantly related to depressive symptoms while for women only, significant factors comprised of physical activity, diet, number of chronic conditions and household debt.

For alcohol use statuses, over the two waves, men who were former, moderate and heavy drinkers had a two and threefold increased incidence rate of symptoms of depression showing an increasing magnitude of coefficients with each increased level of alcohol consumption. For women however, heavy drinkers of alcohol had a reduced incidence rate of number of depression symptoms by about 82%.

Concerning other significant control characteristics, men who were currently married, had an injury, a good household financial situation and lived in the rural areas, had a decreased incidence rate of symptoms of depression by 48%, 79%, 45% and 57% correspondingly compared to men who were not married, did not have an injury in the 12 months preceding the survey, had a bad household financial situation and who lived in the

urban areas. Over time, basic or higher level of education increased incidence rates of depressive symptoms in men in threefold and six fold in that order. In men who were affiliated to the Islamic Religion had 3.178 times increased rates of incidence of depression while in women, being Muslim reduced incidence rates by 20%.

Treatment for injuries or chronic disease medication use increased incidence rates of counts of symptoms of depression by 3.701 in men and 1.615 times. Men belonging to the rich wealth quintile and women belonging to the poor wealth quintile had a 59% and a 54% reduction in rates of incidence of depressive symptoms over time. A unit increase in self-reported health score increased rates of incidence of depressive symptoms in men by 5% in men and 4% in women. During the Wave 2 survey year (2014), men reported a rate of symptoms of depression 3.701 times greater than men in 2007 and women indicated incidence rate 2.480 times greater than women in the preceding survey year. Men who had ever experienced food insecurity had a rate 2.007 times higher than men who had never experienced food insecurity.

Pertaining to factors of women only, which predicted rates of incidence of counts of symptoms of depression, women who reported to be physically active and had a household debt or loan had a 92% and 75% increase in the number of depressive symptoms. Women who consumed five or more servings of fruit and vegetables had a 34% reduction in symptoms of depression relative to those who reported to have consumed less than five servings of fruit and vegetables. A unit increase in the number of chronic conditions in women increased the rates of incidence of depressive symptoms by 60%.

Table 6.1 Random Effects Poisson Panel Regression Model for Assessing the Longitudinal Influence of Categories of Alcohol Use on Depression among Men and Women

Variable	Men		Women	
	IRR	95% CI	IRR	95% CI
Alcohol use status				
Lifetime abstainer	1		1	
Ever used	2.264	[0.955,5.371]	1.057	[0.638,1.752]
Former drinker	2.658*	[1.152,6.135]	0.751	[0.450,1.251]
Moderate drinker	3.105*	[1.232,7.824]	0.535	[0.269,1.064]
Heavy drinker	3.778*	[1.078,13.25]	0.177*	[0.0381,0.820]
Age				
Less than 50yrs	1		1	
50yrs and above	1.364	[0.438,4.246]	1.255	[0.597,2.637]
Marital status				
Not currently married	1		1	
Currently married/living together	0.516*	[0.270,0.987]	0.872	[0.569,1.338]
Level of Education				
None	1		1	
Basic School	3.755***	[1.985,7.100]	0.838	[0.555,1.265]
Secondary/higher	6.349***	[3.118,12.93]	1.635	[0.936,2.858]
Religion				
None	1		1	
Christianity	0.571	[0.246,1.326]	0.286*	[0.107,0.761]
Islam	3.178*	[1.047,9.646]	0.254*	[0.0778,0.830]
Traditional	1.070	[0.386,2.965]	0.600	[0.199,1.804]
Employment status				
Not currently working	1		1	
Currently working	1.326	[0.836,2.104]	0.772	[0.567,1.050]
Diet				
Unhealthy diet	1		1	
Healthy Diet	0.991	[0.663,1.482]	0.665**	[0.488,0.905]
Tobacco				
Never used	1		1	
Ever used	1.041	[0.576,1.882]	1.132	[0.530,2.417]
Chronic Condition(s)	1.203	[0.719,2.012]	1.598**	[1.131,2.257]
Injury				
No	1		1	
Yes	0.209***	[0.0934,0.467]	1.078	[0.640,1.817]
Medication use				
No	1		1	
Yes	3.732***	[2.124,6.560]	1.615*	[1.106,2.359]
Food insecurity				
Never	1		1	
Ever	2.007**	[1.285,3.134]	0.878	[0.641,1.204]
Physical Activity				
Inactive	1		1	
Active	1.182	[0.669,2.089]	1.923***	[1.385,2.670]

Exponentiated coefficients; 95% confidence intervals in brackets

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 6.1 Random Effects Panel Regression Model for Assessing the Influence of Categories of Alcohol use on Depression among Men and Women (continued)

Variable	Men		Women	
	IRR	95% CI	IRR	95% CI
Self-reported health	1.055***	[1.042,1.068]	1.037***	[1.029,1.045]
Social Capital	1.015**	[1.004,1.026]	1.005	[0.997,1.014]
HH financial Situation				
Bad	1		1	
Good	0.549**	[0.355,0.849]	0.888	[0.659,1.196]
HH Debt				
No	1		1	
Yes	1.411	[0.858,2.319]	1.754***	[1.268,2.427]
Place of Residence				
Urban	1		1	
Rural	0.431*	[0.194,0.957]	0.938	[0.554,1.589]
Year				
2007	1		1	
2014	3.701***	[2.251,6.085]	2.480***	[1.809,3.399]
Wealth Quintile				
Poorest	1		1	1
Poor	0.629	[0.371,1.066]	0.463***	[0.301,0.711]
Middle	0.609	[0.340,1.091]	0.834	[0.558,1.245]
Rich	0.408**	[0.219,0.760]	0.753	[0.496,1.143]
Richest	2.096	[0.782,5.618]	0.909	[0.491,1.682]
lnalpha	15.65***	[11.63,21.07]	8.970***	[7.011,11.48]
No. of observations	1550		1448	
Model fit statistics				
AIC	1480.8		2100.2	
BIC	1646.6		2263.8	
Log likelihood	-709.4		-1019.1	
Prob>Chi^2	0.000		0.000	

Source: Computed from WHO SAGE Survey Data; 2007 & 2014
Exponentiated coefficients; 95% confidence intervals in brackets; Coefficients for constants are not exponentiated
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

6.3 Bidirectional Analysis of the Association between Counts of Standard Drinks of Alcohol and Depressive Symptoms

6.3.1 Counts of Standard Drinks of Alcohol Predicting Counts of Depressive Symptoms

Columns 1 and 2 of Table 6.2 display the Random Effects Poisson Panel Regression model of the association between counts of standard alcohol drinks and symptoms of depression in Ghana. The results showed a unidirectional relationship that is, a unit increase in number of standard drinks consumed increased the incidence rate of number of depressive

symptoms (IRR=1.034; p<0.05). Other factors that significantly predicted depression included marital status, level of education, violence or accident-related injury, medication use, food insecurity, physical activity, self-reported health, household financial situation, social capital, household debt, place of residence, survey year and wealth quintile. To elaborate, individuals who have ever had violence or accident-related injury, persons currently married, participants who belonged to the rich wealth quintile and who lived in the rural areas reported a 67%, 54%, 51% and 50% reduction in counts symptoms of depression correspondingly compared to their counterparts. Risk factors of depressive symptoms included having a basic (IRR=3.412; p<0.001), secondary, or higher level (IRR=3.772; p<0.001) of education, having received any chronic disease treatment or using any related medication (IRR=4.675; p<0.001), being physically active (IRR=1.641; p<0.05), belonging to households with good financial situation (IRR=1.568; p<0.05) and having a household debt (IRR=2.484; p<0.001). In 2014, respondents had a fivefold increased risk of number of depressive symptoms (IRR=5.325; p<0.001) compared to 2007. Further, a unit increase in self-reported health was associated with a 7% increase in number of depressive symptoms (IRR=1.070; p<0.001).

6.3.2 Counts of Depressive Symptoms Predicting Counts of Standard Drinks of Alcohol

Columns 3 and 4 of Table 6.2 show the association between counts of symptoms of depression and standard drinks of alcohol. Depression did not significantly influence number of standard alcoholic drinks consumed among the total sample. With the exception of diet, self-reported health and social capital, all other control variables predicted alcohol consumption among the sample. Persons 50 years and above had a 29% increase in the number of standard drinks of alcohol consumed. Women consumed 61% fewer counts of standard drinks of alcohol compared to men. Having secondary or higher level of education increased number of drinks consumed by two folds (IRR=2.461; p<0.001) compared to

persons with no education. Pertaining to religious affiliation, Muslims (IRR=0.421; p<0.001), followed by Christians (IRR=0.706; p<0.001) were less likely to consume alcohol compared to persons with no religious affiliation while individuals affiliated to the Traditional Religion had a 54% increase in number of alcoholic drinks consumed compared to persons with no religious affiliation. Respondents currently working had 22% increase, persons who had ever used tobacco had a 51% increase, individuals who were taking treatment for or any chronic condition-related medication had a 72% increase, persons who were food insecure had a 51% increase, and physically active respondents reported a 95% increase in number of standard drinks of alcohol consumed over time. Other categories of participants who were less likely to use alcohol over time include individuals whose household financial situation was good (IRR=0.700; p<0.001), those who had a household debt (IRR=0.700; p<0.001), persons living in the rural areas (IRR=0.616; p<0.001), and respondents belonging to the poor (IRR=0.805; p<0.001), middle (IRR=0.822; p<0.01) and rich (IRR=0.804; p<0.01) wealth quintile categories. A unit increase in number of chronic conditions decreased standard alcohol drinks consumed by 18% and in 2014, participants were less likely to consume alcohol as number of standard drinks used reduced by 43s% compared to participants in 2007.

Table 6.2 Random Effects Poisson Panel Regression Model of the Bidirectional Association between Counts of Standard Alcohol Drinks and Symptoms of Depression in Ghana

	Alcohol use predicting depression		**Depression predicting alcohol use**	
Variable	IRR	95% CI	IRR	95% CI
Alcohol use	1.034*	[1.004,1.065]		
Depression			0.975	[0.947,1.004]
Age				
Less than 50yrs	1		1	
50yrs and above	0.460	[0.177,1.194]	1.293*	[1.056,1.583]
Marital status				
Not currently married	1		1	
Currently married/living together	0.460*	[0.248,0.852]	0.918	[0.805,1.047]
Sex				
Male	1		1	
Female	1.280	[0.635,2.581]	0.391***	[0.311,0.493]
Level of education				
None	1		1	
Basic school	3.412***	[1.908,6.102]	1.110	[0.961,1.281]
Secondary/higher	3.772***	[1.994,7.136]	2.461***	[2.081,2.912]
Religion				
None	1		1	
Christianity	0.482	[0.213,1.090]	0.706***	[0.612,0.815]
Islam	0.976	[0.367,2.594]	0.421***	[0.320,0.553]
Traditional	0.840	[0.329,2.141]	1.536***	[1.264,1.868]
Employment Status				
Not currently working	1		1	
Currently working	0.985	[0.637,1.523]	1.224***	[1.091,1.374]
Diet				
Unhealthy	1		1	
Healthy	0.884	[0.592,1.321]	1.038	[0.952,1.132]
Tobacco use				
Never used	1		1	
Ever used	1.002	[0.566,1.774]	1.512***	[1.264,1.807]
Chronic condition(s)	1.287	[0.900,1.841]	0.822**	[0.711,0.950]
Injuries				
No	1		1	
Yes	0.328**	[0.155,0.694]	0.690***	[0.599,0.794]
Medication use				
No	1		1	
Yes	4.675***	[2.375,9.204]	1.718***	[1.431,2.062]
Food insecurity				
Never	1		1	
Ever	1.971**	[1.264,3.076]	1.505***	[1.371,1.651]
Physical activity				
Inactive	1		1	
Active	1.641*	[1.020,2.640]	1.949***	[1.719,2.210]

Table 6.2 Random Effects Poisson Panel Regression Model of the Bidirectional Association between Counts of Standard Alcohol Drinks and Symptoms of Depression in Ghana (continued)

	Alcohol use predicting depression		**Depression predicting alcohol use**	
Variable	IRR	95% CI	IRR	95% CI
Self-reported health	1.070***	[1.055,1.085]	1.000	[0.997,1.002]
Social capital	1.015*	[1.003,1.027]	0.997	[0.995,1.000]
HH financial situation				
Bad	1		1	
Good	1.568*	[1.050,2.343]	0.764***	[0.702,0.833]
HH Debt				
No	1		1	
Yes	2.484***	[1.497,4.120]	0.700***	[0.628,0.780]
Place of residence				
Urban	1		1	
Rural	0.503*	[0.287,0.881]	0.616***	[0.493,0.770]
Year				
2007	1		1	
2014	5.325***	[3.159,8.977]	0.566***	[0.519,0.618]
Wealth quintile				
Poorest	1	1		1
Poor	0.855	[0.524,1.394]	0.805***	[0.724,0.893]
Middle	1.060	[0.602,1.865]	0.822***	[0.731,0.923]
Rich	0.490*	[0.268,0.896]	0.804**	[0.699,0.923]
Richest	1.849	[0.782,4.368]	0.945	[0.787,1.134]
lnalpha	15.22***	[12.13,19.09]	3.606***	[3.196,4.068]
No. of observations	2001[14]		2001	
Model fit statistics	2058.3		9420.7	
AIC	2220.8		9583.2	
BIC	-1000.2		-4681.4	
Log likelihood	166.5		1420.1	
Prob>Chi2	2001		2001	

Source: Computed from WHO SAGE Survey Data; 2007 & 2014
Exponentiated coefficients; 95% confidence intervals in brackets; Coefficients for constants are not exponentiated
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

6.4 Discussion

Panel evidence on the association between alcohol use and mental health in limited resource contexts is infrequent. Further, there has been mixed findings on the direction of the association. Longitudinal data existing on the subject to conclude on the bidirectional relationship is insufficient. Hence, this study fills the knowledge gap by using panel evidence to clarify and extend previous studies as it investigates associations between

[14] The number of observations are less than 2998 due to missing responses on variables

alcohol use and mental health, specifically counts of symptoms of depression across time in a limited resource context. This answers research questions three and four of the thesis.

First, considering the relationship between alcohol use status and depression, a longitudinal relationship was observed in the adjusted model of Table 6.1. Gender-specific analysis showed male former, moderate and heavy drinkers in that order having a higher likelihood of increased counts of symptoms of depression compared to lifetime abstainers. Among men, the first hypothesis tested in this study that, heavy alcohol users were more likely to have poor mental health compared to lifetime abstainers over time was confirmed. Among women, heavy drinkers were less likely to have higher counts of depressive symptoms compared to abstainers. Contrary to this finding, literature reviewed has commonly found female heavy alcohol users more likely to have depressive symptoms compared to non-heavy users (Marmorstein, 2009; Zahn et al., 2012). To explain this study's results, it is possible that at the heavy alcohol use status, female heavy drinkers may not have used alcohol to the tolerance level or equilibrium, that is, the level at which depression sets in. The second hypothesis was disproved as male moderate alcohol users were more likely to have poorer mental health compared to male lifetime abstainers.

Among others, control variables which reduced the incidence rates of high counts of symptoms of depression among women included being Christian or Muslim, and belonging to the poor wealth quintile. Evidence on religion's influence on depression explain Christian women's lower depression scores in the light of church attendance or level of religious involvement with women attending church service often and using prayer to cope with life strains (Mirola, 1999; Li et al., 2016). Muslim women's lower depression scores were found to be linked to their wearing of Hijab which was a pointer to their higher level of body esteem (Hodge et al., 2017). Consistent with findings from Wave 1, women from poor wealth quintile households had fewer symptoms in the longitudinal model. From the descriptive statistics, their prevailing household economic circumstances did not negatively

influence their mental health, as on the individual level, they were not abjectly poor. For instance, majority of women had never been food insecure in the 12 months prior to the survey and they did not have debts. Medication use by both men and women predicted higher depressive symptoms count. This could be attributed to chronic condition(s) medication non-adherence as reported by some quantitative and qualitative studies carried out in Ghana, other developing and developed contexts (Atinga et al., 2018; Semahegn et al., 2018).

Pertaining to the bidirectional analysis model, counts of standard drinks of alcohol predicted number of depressive symptoms but depressive symptoms did not predict alcohol consumption. This means that in the sample studied people who consumed more counts of alcohol had higher number of symptoms but persons with high counts of depressive symptoms did not consume higher counts of standard alcoholic drinks. From this, the third hypothesis was disproved, as the relationship was unidirectional and not bidirectional as hypothesized. A body of longitudinal evidence from developed contexts have shown similar unidirectional relationship (Moscato et al., 1997; Boschloo et al., 2012; Tsai et al., 2013; Gea et al., 2013; Cabello et al., 2017; Lee et al., 2018). This affirms findings from a systematic review of 255 reviews by Rehm et al. (2017) which reported that the causal pathway of heavy alcohol use causing depression is stronger and more prevalent in many contexts compared to depressive disorders leading to alcohol use and the reciprocal causal hypotheses.

With respect to the bidirectional analysis model where the number of standard drinks consumed were associated with depressive symptoms in Table 6.2, confounding variables, which were protective against depression, included marital status, injury status, residing in the rural areas and belonging to the rich wealth quintile. The finding of currently married participants having lower counts of symptoms in the longitudinal model has been corroborated by existing literature and various explanations has been advanced (Whisman

et al., 2006; Jang et al., 2009; Law & Sbarra, 2009; Ciciurkaite & Brown, 2018). First, the theory of selectivity posits that persons who are less depressed (healthier individuals) are more likely to be married. The second theory explicates that marriage makes available a wider range of social support and economic resources, which help partners cope with stressful life situations (Jang et al., 2009). The third theory advances that, because of more resources available to persons in unions, they become less susceptible to stress-related situations (Whisman et al., 2006; Jang et al., 2009). Resultantly, married persons are less reactive to parental, economic and housework related stresses because of the support they have received (Whisman et al., 2006).

The bidirectional model again showed that over time, individuals residing in rural areas were less likely to have poor mental health compared to person living in urban centres. Gruebner et al. (2017) advance that, high levels of poverty, social inequalities and isolation, which characterise urban settings account for the differences in prevalence of mental illness among urban and rural residents. The finding of individuals belonging to the rich wealth quintile households having fewer symptoms has also been supported by extant literature (Carter et al., 2009). Having had a violence-or accident-related injury in the 12 months preceding each wave predicted lower depression counts over time. There is the likelihood that a high proportion of persons experiencing these injuries in the sample may have received treatments for them hence the injuries may not be a source of stress which would increase depression levels.

Risk factors which predicted higher counts of symptoms of depression over time included having a basic or secondary level of education, medication use, food insecurity, being physically active, having a worse self-reported health, belonging to households with good financial situation, having higher social capital scores, having a household debt or unpaid loans, and the 2014 survey year. Cross-sectional and longitudinal studies reviewed from Western and SSA countries affirm the negative influence of food insecurity and hunger

on depression (Weaver & Hadley, 2009; Sorsdahl et al., 2011). Sorsdahl et. al. (2011) in their study of 4185 adults in South Africa indicated that individuals from households that did not have enough food sometimes were more likely to have 12-month and lifetime mental disorders including MDE. Reporting findings from various quantitative and qualitative studies in their systematic review of literature, a theme that emerged was food insecurity as a source of stress, anxiety and shame (Weaver & Hadley, 2009).

Persons who reported their household financial situation as good and or had an unpaid debt or loan reported higher counts of depression compared to their counterparts. It is possible that though their household situation was good and majority of the sample were currently employed, unpaid debts or reduced levels of social capital scores by Wave 2 as shown in Table 4.2 could be a source of strain which in effect negatively impacts mental health. This effect of household debt on individuals mental health has also been supported by two recent longitudinal studies conducted in United States and three European countries (Berger et al., 2016; Hiilamo & Grundy, 2018) and a qualitative study of migrant squatters in Accra (de-Graft Aikins & Ofori-Atta, 2007). Though previous evidence have reported the protective influence of physical activity on depressive symptoms (Karoly et al., 2007), this study found a detrimental effect. The measure of physical activity was work-related and travel-related physical activity, which have a high tendency to induce stress, compared to non-work-related exercise. This study controlled for year effects aimed at showing aggregate trends in alcohol use and symptoms of depression. In 2014, among the total sample, risks of depressive symptoms were higher compared to 2007. This also reflects findings from the univariate descriptive analysis in Table 4.4, which shows an increase in counts of depressive symptoms in the same year.

From Column 3 of the bidirectional analysis results in Table 6.2, which considers the influence of number of depressive symptoms on alcohol use, though depressive symptoms did not predict alcohol consumption, several control variables significantly

predicted alcohol consumption. With the exception of marital status, diet, self-reported health and social capital scores, all other control variables were linked to the number of standard alcoholic drinks consumed in Ghana. Christians, Muslims, being female, persons with chronic conditions or injuries, individuals whose household financial situation was good or had household debts were more likely to consume fewer counts of standard alcoholic beverages. Additionally, participants living in the rural areas, belonging to the poor, middle and rich wealth quintiles compared to their counterparts reported consuming fewer standard alcoholic drinks over time.

Christians and Muslims taking fewer counts of alcohol are explained that their religious belief systems encourage healthy behaviour as they stipulate eschewing anti-social behaviour and substance use such as alcohol, tobacco and drugs (Cornah, 2006b; Levin, 2010). Similarly, lower counts of alcoholic beverage consumption of Muslims relative to Christians and persons without an religious affiliations have been reported by Welcome and Alekseevich Pereverzev (2010). Females consuming fewer drinks over time compared to men has been confirmed in some global epidemiological studies (Rehm et al., 2009; Griswold et al., 2018). Contrary evidence show increased alcohol use by females over time compared to males in a sample of college students in the United States (Lindgren et al., 2020).

Studies on the influence of place of residence on alcohol use has been mixed. Islam et. al. (2017) affirm this study's results by indicating rural residence predicting lower odds of alcohol consumption. Two studies conducted in the United States and Nigeria reported contrasting findings, that is, a higher odds of alcohol use by rural residents (Borders & Booth, 2007; Lasebikan, Ayinde, Odunleye, et al., 2018). These studies however do not provide information on the influence of residence in rural areas predicting increased counts of alcohol over time.

The finding of injuries leading to consumption of fewer standard drinks of alcohol is explained that during treatment for injuries, patients may be advised to abstain from alcohol due to its delaying of the healing process (Eliasen et al., 2013; Weil et al., 2018). To add, patients may not be able to purchase alcohol due to immobility because of injury severity and or hospitalisation (Weil et al., 2018). Further, persons whose violence- or accident-related injuries were caused by intoxication may decide to stop to avoid future occurrences (Weil et al., 2018). The aforementioned explanations may also apply to persons with chronic conditions such as stroke, hypertension, lung disease, diabetes among others in this study, and therefore account for their lower consumption of alcohol compared to their counterparts without chronic conditions. In the 2014 survey year, participants consumed fewer counts of alcohol compared to 2007. To explain, it is possible that as the study sample aged and experienced a higher number of chronic conditions over the two survey periods, it became necessary to reduce alcohol intake. This finding calls for future studies on existing policies and economic events, which explain this aggregate trend.

Among the control variables in the bidirectional model, factors accounting for increased counts of alcoholic beverages over time included being affiliated to the Traditional Religion, having ever used tobacco, medication use, and currently employed persons, having ever experienced food insecurity and being physically active. The belief system of the African Traditional Religion unlike the other religions considers alcohol as a “spiritual drink” and integral to religious rituals and social activities (Acheampong, 1996; Myadze & Rwomire, 2014) hence could explain its increased use by participants affiliated to the Traditional Religion. Food insecurity and debts as poverty-related stressors has been linked to increased alcohol consumption in a number of studies (Jackson et al., 2016; Bergmans et al., 2019). Employed person tend to have the resource to afford an increased number of alcoholic drinks as supported by Mackinnon et al. (2019) or the stressful environment at the workplace may cause them to increase alcohol consumption hence may account for the

higher number of drinks among them over time as reported in this study. Persons who indicated using medication for depression or chronic conditions in this study reported higher counts of symptoms of depression and standard drinks of alcohol. Medication use increasing depression symptoms may be indicative of medication non-adherence in the sample as from the univariate analysis, the proportion of persons using medication for depression and the various chronic conditions declined by Wave 2 despite the increase in the number of chronic conditions over time. Further, it is possible that some were using non-prescribed medication. The data was limited because respondents were not asked the type of medication they were using, whether prescribed or not. They may also have been co-using orthodox and herbal medication, which may not be effective in managing the chronic conditions. In addition, persons using chronic disease medication recorded increased number of alcohol drinks despite persons with higher counts of chronic conditions recording decreased counts of standard alcoholic drink consumption. From the univariate results, not all persons with chronic conditions were using medication by Wave 2 and those using medication could have been using alcohol to numb pain and cope with the stress and anxiety related to the chronic condition as indicated in a similar study which examined the co-use of alcohol and medication (Haighton et al., 2018). Physically active persons had higher counts of standard alcohol drinks in consonance with Kopp and colleagues' (2014) population-based study.

CHAPTER SEVEN

COMMUNITY PERCEPTIONS OF ALCOHOL USE AND MENTAL HEALTH

7.1 Introduction

This Chapter presents qualitative findings on the community perceptions of alcohol use and mental health using secondary qualitative data from Social Representations of Stroke and Stroke Care in Ghana Study (Sanuade, 2018). First, characteristics of participants from the 30 focus groups are described. Afterwards, themes obtained using thematic network analysis and the Social Construction theory of mental health are presented with quotations from the transcripts to illustrate themes identified. Secondary qualitative data were utilised as it fitted into the objectives of this study by answering the research question of what are the community level perceptions of alcohol use and mental health. Again, in using secondary qualitative data, duplicative and redundant data collection is avoided ensuring full utilisation of publicly funded research to advance scientific knowledge for the public good. As indicated in previous chapters, community level views on alcohol use and mental health would allow deeper insights into the complexity of perceptions, cultural beliefs, group norms and attitudes of persons in various sociocultural milieu in Ghana.

7.2 Sociodemographic Characteristics of Focus Group Participants

Focus group discussions were conducted in five communities across five regions in Ghana namely Ga Mashie in Greater Accra, Agorve, Keta in the Volta Region, Gyegyeano, Cape Coast in the Central Region, Tafo, Kumasi in the Ashanti Region and Chanshegu, Tamale in the Northern Region. Characteristics of participants are shown in Table 7.1. About 255 participants took part in the FGDs. The highest and least proportion of participants were from Tafo (21.2%) and Gyegyeano (18.8%) respectively. Across all communities, participants 35-59 years were the most. There were more women (51.8%) than men. Most of the participants had secondary school education (60%); were traders by

profession (25.0%); currently married (48.6%) and were affiliated to the Christian Religion (65.1%).

Table 7.1 Participants Sociodemographic Characteristics

	Ga Mashie	Agorve	Gyegyeano	Tafo	Chanshegu	Total (n=255)
Age						
18–34	20.5	18.2	21.6	22.7	17.0	88
35–59	20.0	20.0	18.9	18.9	22.2	90
60 and above	20.8	20.8	15.6	22.1	20.8	77
Sex						
Male	19.5	21.1	18.7	20.3	20.3	123
Female	21.2	18.2	18.9	22.0	19.7	132
Education						
None	11.3	21.0	4.8	4.8	58.1	62
Primary	17.9	42.9	7.1	21.4	10.7	28
Secondary	24.8	15.7	24.2	27.5	7.8	153
Higher	11.1	0.7	44.4	33.3	0.0	9
No response	33.3	0.0	66.7	0.0	0.0	3
Occupation						
Unemployed	23.4	12.8	19.1	38.3	6.4	47
Trading	21.9	12.5	18.8	15.6	31.3	64
Farmer	8.0	42.0	0.0	2.0	48.0	50
Artisan	29.4	6.0	26.5	32.4	2.9	34
Others	30.2	18.6	11.6	32.6	7.0	43
Retired	0.0	28.6	71.4	0.0	0.0	14
No response	0.0	0.0	100	0.0	0.0	3
Marital Status						
Never married	32.2	15.6	24.4	18.9	8.9	90
Married	11.3	26.6	14.5	12.9	34.7	124
Formerly married	28.1	9.4	25.0	37.5	0.0	32
No response	0.0	33.3	44.4	22.2	0.0	9
Religion						
Christian	26.5	18.1	24.7	30.1	0.60	166
Muslim	4.8	0.0	11.1	4.8	79.37	63
Traditional/Others	18.2	81.8	0.0	0.0	0.00	11
None	75.0	25.0	0.0	0.0	0.00	4
No response	0.0	45.5	0.0	54.5	0.00	11
Number	52	50	48	54	51	255
Total	20.4	19.6	18.8	21.2	20.0	100.0

Adapted from "Social Representations of Stroke and Stroke Care in Ghana Study", by Sanuade (2018), Wellcome Open Research. Retrieved July 10, 2019, from https://wellcomeopenresearch.org/articles/3-87

7.3 Community Perceptions of Mental Health and Alcohol Use

The Social Construction theory states that, mental illness is culturally determined as it has social meanings attached to it, which do not directly stem from the biological nature

of mental illness (genetic or chemical imbalance causation) but rather socio-cultural notions of the disease. These cultural notions determine how persons in a society interact with those afflicted and may have an effect on their experience of the disease, health as well as access to healthcare (Conrad & Barker, 2010).

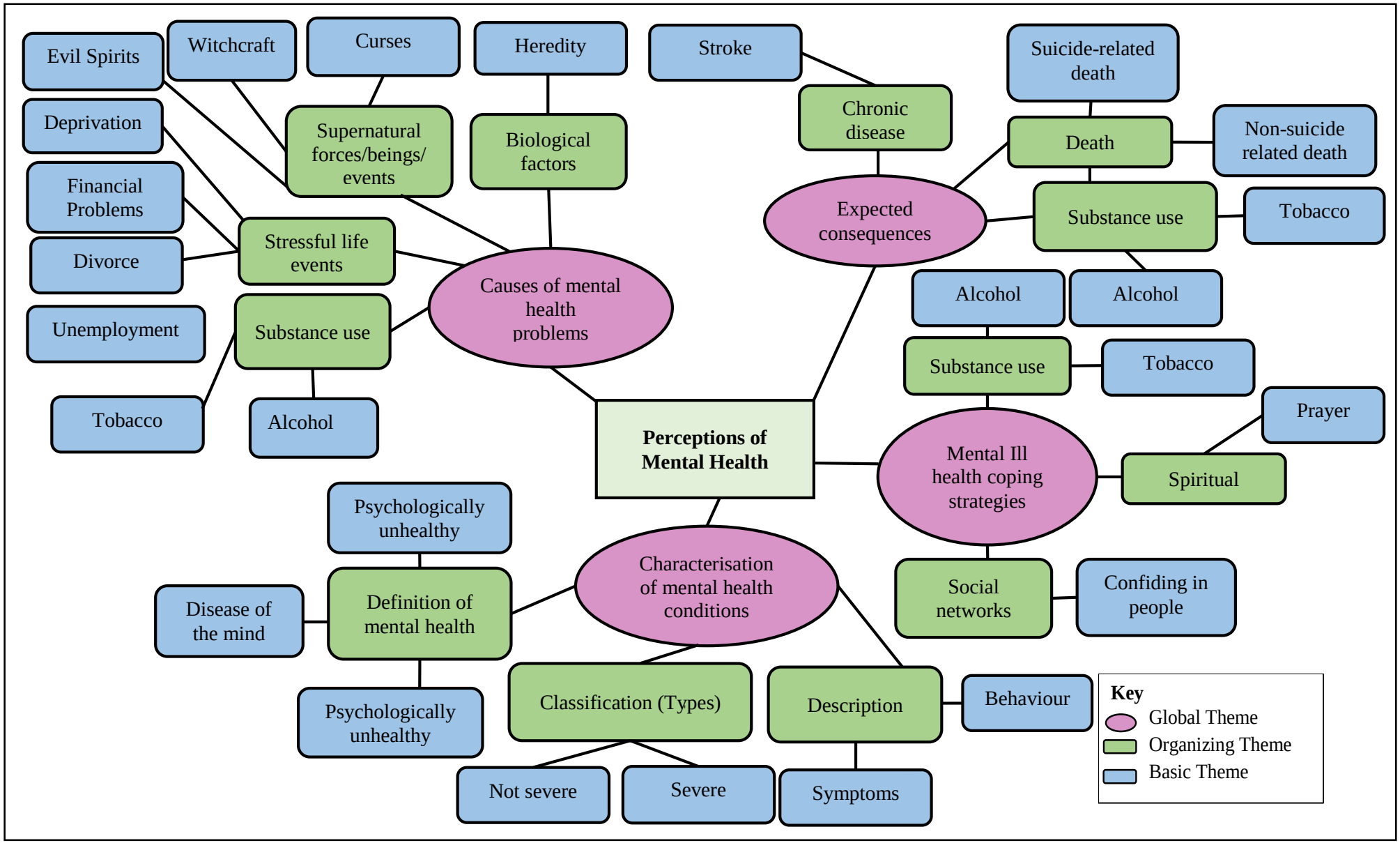
Second, the sociocultural meanings of mental disorders develop through interactions in a society. Cultural notions of mental disorder shape the behaviours of those afflicted and their reactions may in turn change the original labels (Horwitz, 2012). The importance of eliciting community level notions of mental health, mental illness, alcohol use through focus group discussions is important to understand shared beliefs, group norms, cultural and social meanings attached to these phenomena. Subsequently, this has implications for health seeking behavior and developing intervention strategies for mental health (Patel, 1995). Figures 7.1 through to 7.6 show the thematic networks representing an exploration of views of adults on alcohol use and mental health in five communities in Ghana.

Three levels of themes based on related ideological content were derived from the FGD transcripts using the Social Construction theory. They included the global, organizing and basic themes. On views on mental health, four global themes that emerged comprised of 13 organizing themes, which were further sub-categorised into basic themes expressing participants' characterisation of mental health, views on causes of mental health problems and expected consequences of poor mental health. Concerning community perceptions of alcohol use there were 3 global themes which comprised of 11 organizing themes. Participants discussed the sociocultural contexts of alcohol use, causes and outcomes of alcohol consumption. The subsequent sections and figures discuss the various levels of themes into detail.

7.3.1 Community Perceptions of Mental Health

Participants shared views on mental health by defining mental health, indicating severity in forms of mental illness, perceived causes, symptoms, expected consequences, outcomes and coping strategies usually adopted. These are indicated in the thematic network in Figure 7.1. Table E1 in Appendix E shows frequency tables of themes and codes related to community perceptions of mental health.

Figure 7.1 Thematic Network of Community Perceptions of Mental Health



Source: Field Data (Sanuade, 2018)

7.3.1.1 Characterisation of Mental Health

Figure 7.2, a subset of Figure 7.1 highlights the thematic network for the global theme 'Characterisation of mental health conditions'. In the focus group discussions, participants indicated what constitutes mental health by defining or describing mental health and illness. They also classified mental illnesses according to severity and highlighted distinguishing symptoms of types of mental illnesses. In defining mental health, an elderly participant from Gyegyeano in the Central Region indicated mental health as a state of being psychologically healthy or unhealthy. He further noted symptoms of depression, as comprising of insomnia and weight loss without being on diet, which are in consonance with two out of nine symptoms specified in the DSM-IV third revision biomedical diagnostic manual for depression:

> *"Psychologically if you can't sleep…*[15]*you are worrying on and off, that makes you become even sick. You grow lean even though you will be eating alright but because there is something worrying your mind… So psychologically you can be either healthy or not healthy."* ***[Males, 60+ years, Gyegyeano]***

Again, participants presented general local concepts of common mental disorders (CMDs) using the terms "thinking or worrying too much" which appeared to describe anxiety or depression. Further, a young participant from Ga Mashie, Accra in describing mental illness defined depression as a state in which an individual worries too much about an issue and is sad. In the same vein, Patel and Stein (2015) assert that this description is widely used in many African and developing countries.

> ***I:*** *What is depression?*
> ***R:*** *An issue is worrying you. You feel down. You might think that when you drink it [alcohol] that problem will vanish. But you don't know when it would leave* ***[Males, 18-34, Ga Mashie]***

Various focus group participants categorised mental illness based on severity by making a distinction between mild and severe forms of mental disorders. Participants indicated that

[15] Some parts of some sample quotes in this chapter have been omitted as a result of the fact that they are not immediately relevant to the theme identified

severe mental illness is apparent in that individuals with the condition (especially psychotic) showed some symptoms such as consumption of filthy things, abnormal looks, unintelligible speech, and violent behaviour. To participants, these were abnormal behaviour. They used local Akan labels for severe mental illness. They described severe mental ill health as madness 'abɔdam' 'eti yareɛ' or 'adwen mu yare' a disease of the head or mind and attributed these symptoms exhibited by such persons to their minds not working well. They further described such individuals as dangerous. For instance, three adults from Gyegyeano and Ga Mashie remarked that:

> *"As for mad people their case is different. What we think to be filthy, they see it to be clean and can eat them. We are the ones who see those foods as filthy but for them it's clean. This is because their minds are not working well. This medical condition is also a difficult one. There was one madman who was beheading some residents in a village."* ***[Males, 35-59 years, Gyegyeano]***
>
> *"For a mad man, his condition is even worse. That mad person can kill someone."* ***[Males, 35-59 years, Gyegyeano]***
>
> *"The one you are referring to that he is mentally unsound, he will speak alright but it won't make sense. You will hear everything he says but his speech will not make sense."* ***[Males, 18-34, Ga Mashie]***

Participants again intimated that some mental disorders are less apparent compared to psychotic conditions. For instance, stroke patients with mental health problems are better behaved than mentally ill individuals with psychotic conditions.

> ***R****3: But some stroke patients also have their minds [may not have mental disorders] even when the stroke is a very serious one.*
> ***R5****: Yes, but such a person is at home and does not misbehave.*
> ***R****3: Yes, I think the person sometimes loses memory.* ***[Males, 35-59 years, Gyegyeano]***

In addition, participants from various groups noted that for one to be healthy, mental health was important. An elderly participant and two participants from Gyegyeano, Ga Mashie and Chanshegu respectively expressed their views as follows:

> *"So health by itself doesn't mean you walk and do things about freely. The moment there's something out of balance, it makes the whole body unhealthy."* ***[Males, 60^{+}years, Gyegyeano]***
>
> *"It [Health] is the wellbeing of an individual. Both physically, and mental."* ***[Females, 18-34 years, Ga Mashie]***

R1: *Good health is peace of mind.*
R2: *Peace of mind is when you are sitting and your mind is not disturbed.* ***[Females, 18-34 years, Chanshegu]***

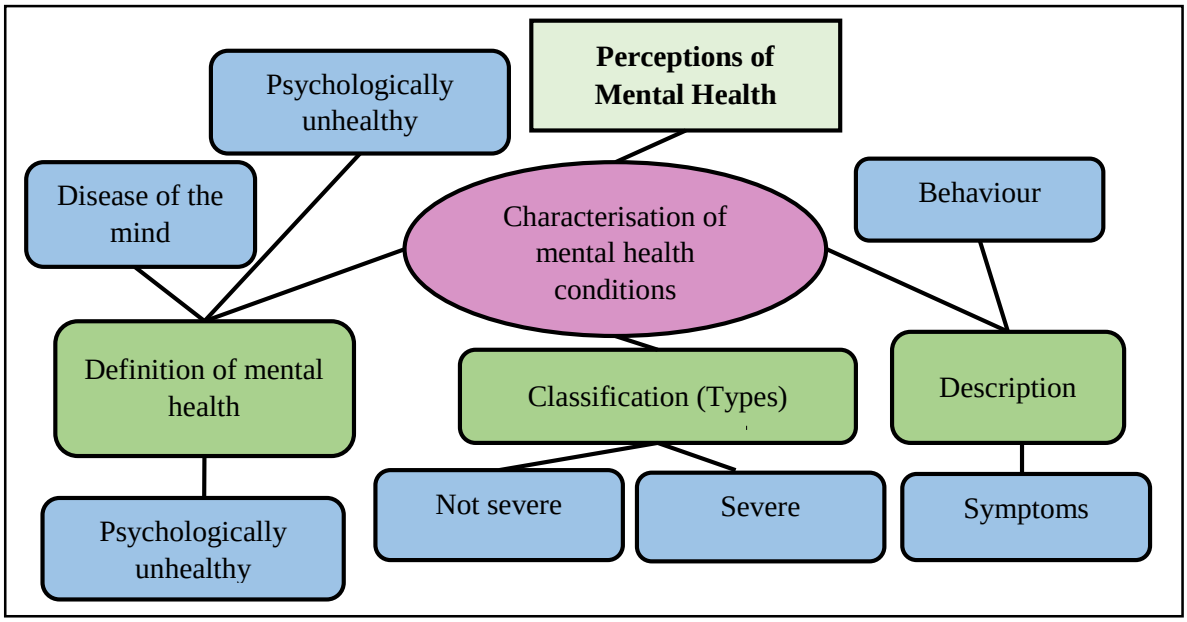
7.3.1.1.1 Subpopulations at Risk of Poor Mental Health

As part of sharing their views on mental health in the various communities, some participants indicated mental health problems to be prevalent among elderly persons and men. This was because in their view, elderly persons think too much. To them, men shouldered most of the responsibilities at home and therefore they were always stressed out.

I*: Why is it that the elderly people get these diseases [chronic diseases including mental illness] more than any other group?*
R*: It is because of stress. Also it is because of too much worrying. These elderly people think a lot."* ***[Females, 18-34 years, Gyegyeano]***

R3&4*: It is men. Men die early.*
R*1: This is because men have a lot of responsibilities that may make them worry a lot. They have to bring money home, take care of their wives and children, etc. so they are mostly stressed out.* ***[Males, 35-59 years, Tafo]***

Figure 7.2 Thematic Network for the Global Theme on Characterisation of Mental Health Conditions



Source: Field Data (Sanuade, 2018)

7.3.1.2 Perceived Causes of Mental Health Problems

When discussing the perceived causes of mental health problems, the focus group participants outlined causes of mental illness comprising of human agency, spiritual forces, stressful life events, chronic conditions, and substance abuse.

7.3.1.2.1 Supernatural Forces

With respect to supernatural forces, participants mentioned witchcraft and curses as causes of poor mental health. Witchcraft is often attributed to a living person with evil powers who caused mental illness. An elderly man from Gyegyeano stated that:

> *"Unfortunately, for us in Africa, it is only the oldies, the old women who are regarded as witches. They will say that old lady at that place is the cause of your illness. Then they will go and sack that woman from the house to another place. Meanwhile she doesn't know about you. So that is the belief. The moment there is a chronic illness or disease in the family, then they attribute it to someone who is causing it. That is the belief and then they consult a spiritualist. And then he too because he wants money, will endorse it"* ***[Males, 60^{+}years, Gyegyeano]***

A substantial number of participants agreed that individuals could be cursed with mental illness due to wrongdoing. An elderly man from Tafo in Kumasi specified this when he said:

> ***R****: There is also madness.*
> ***I****: Would that form part of the chronic or non-chronic ailment*
> ***R****: It depends. Sometimes we are able to cure madness too. Listen to me. Madness could be in the family line or it could be a curse as a result of a wrong doing. So it can be chronic.* ***[Males, 60^{+}years, Tafo]***

The organizing theme supernatural causes of mental illness was identified in the focus group discussions. To illustrate, a participant from Tafo indicated that evil spirits caused mental illness:

> ***I:*** *Let me ask is there the possibility of someone getting a chronic disease as a result of being a victim of witchcraft or spiritual activities?*
> ***R:*** *Yes*
> ***I****: Which of these can be contracted spiritually?*
> ***R1:*** *AIDS…Yes. There is also madness* ***[Females, 35-59 years, Tafo]***

7.3.1.2.2 Biological factors

It was reported that mental illness could be inherited through one's family line (genetic) hence agreeing with the biomedical causal model of disease causation. A participant from the elderly male group said that:

> *"Listen to me. Madness could be in the family line…."* ***[Males, 60+ years, Tafo]***

7.3.1.2.3 Stressful Life Events

Stressful life events such as, unemployment, disruptions in marriage, financial problems, loneliness and dependence on others for food (deprivation) were listed by the participants as being the cause of mental health problems. This affirms the quantitative results as respondents not currently married due to separation/divorce, widowhood, being never married were more likely to have depressive symptoms over time compared to those currently married. Also, persons experiencing the stressful life event of financial challenges (including belonging to the poorest wealth quintile, having a household debt and being hungry without money to buy food (deprivation)) were more likely to have depressive symptoms over time compared to their counterparts.

Participants from three of the study communities stated the following:

> ***R****: That is what my brother here said. People worry a lot.*
> ***R2****: If jobs are created, all these health conditions will reduce****. [Males, 35-59 years, Tafo]***

> *"It's because some people's wives have left them. So they start thinking."* ***[Males, 35-59 years, Agorve]***

> *"Let me add something to what my brother has said. If you don't have money or you are needy, and lonely, you worry a lot. If you worry a lot, it can affect your brain…"* ***[Males, 35-59 years, Tafo]***

> ***I****: So hardships can bring about sickness? Ok. Can you explain?*
> ***R****: You become sad or depressed when you are in some financial difficulties. That alone can bring about sickness* ***[Males, 18-34 years, Tafo]***

> ***I:*** *Ok, the problems are a lot.*
> ***R:*** *In addition, what to eat….When you have to depend on another person for food… [you will think a lot]* ***[Males, 60+ years, Chanshegu]***

7.3.1.2.4 Chronic Diseases

On chronic diseases as a perceived cause of mental ill health, participants mentioned that stroke could cause mental problems. This finding affirms the quantitative results which showed chronic conditions predicting depression both coss-sectionally and longitudinally.

Young and adult male participants from Tafo stated that:

> *"People who have the disease [stroke] think or worry a lot when they compare the times they used to go anywhere and do things on their own to when people even have to bath and feed them. The worrying may even cause more sickness."* ***[Males, 18-34 years, Tafo]***
>
> *"I think stroke has different ways of manifesting itself in the patients. Some people who get stroke become mentally unstable."* ***[Males, 35-59 years, Tafo]***

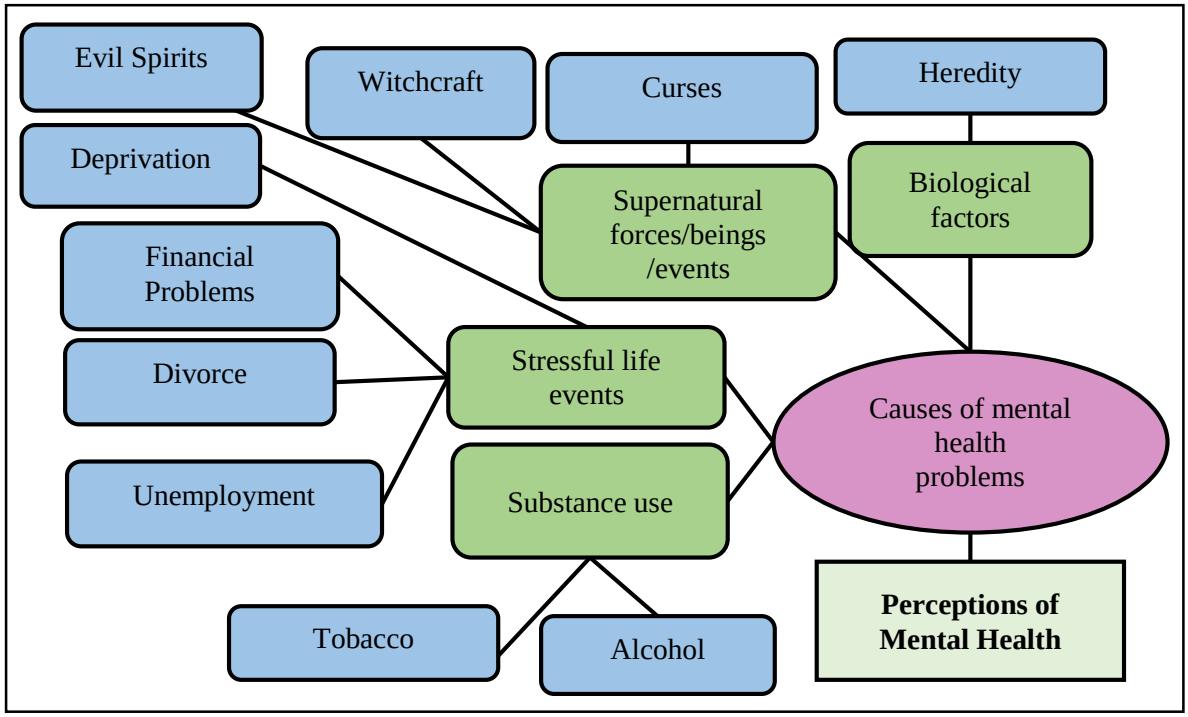
7.3.1.2.5 Substance Use

Alcohol and other psychoactive substances were indicated in most of the group discussions as causing mental illness. However, excessive drinking of alcohol was precipitated by a stressful life event, for instance divorce, could cause one to consume alcohol, which would then result in poor mental health.

> ***I****: What about divorce?*
> ***R****: As for that one, you will drink till you get mad.* ***[Males, 60^{+} years, Tafo]***

Figure 7.3 indicates the global theme of perceived causes of mental health problems and the organising and basic themes.

Figure 7.3 Thematic Network Showing the Global Theme of Perceived Causes of Mental Health Problems



Source: Field Data (Sanuade, 2018)

7.3.1.3 Expected Consequences of Mental Health Problems

7.3.1.3.1 Substance Use

The focus group discussants outlined the use of substances such as alcohol and tobacco as consequences of mental health problems. For instance hazardous use of alcohol was indicated as a consequence of marital infidelity and dissolution in the group of elderly respondents from Ga Mashie.

> ***R:*** *....When it happens to someone [poor mental health as a result of marital dissolution] when the person does not drink poison, he might drink excessively to the extent that he cannot even walk well.* ***[Males, 60^{+} years, Ga Mashie]***

7.3.1.3.2 Chronic Diseases

The participants made known various consequences of untreated mental health problems. Figure 7.4 depicts the thematic network of the global theme of consequences of mental health problems. They comprised of chronic diseases and death. There was a consensus in the groups on poor mental health leading to chronic conditions such as stroke and hypertension.

R1: *Look! Serious thinking can even give you stroke.*
R2: *Yes lots of thinking* ***[Males, 60+years, Ga Mashie]***

I: *Depression. How does that affect our health? Does it give us good health or ailment to us?*
R: *It causes BP.* ***[Males, 35-59 years, Chanshegu]***

7.3.1.3.3 Death

Participants indicated that mental ill health resulted in both suicide-related and non-related deaths. In sharing an experience in the community, an elderly participant from Ga Mashie recounted a suicide-related death, which occurred of a young man whose wife left him for another man. According to the narrative provided by other participants in the group, he was mentally disturbed and committed suicide.

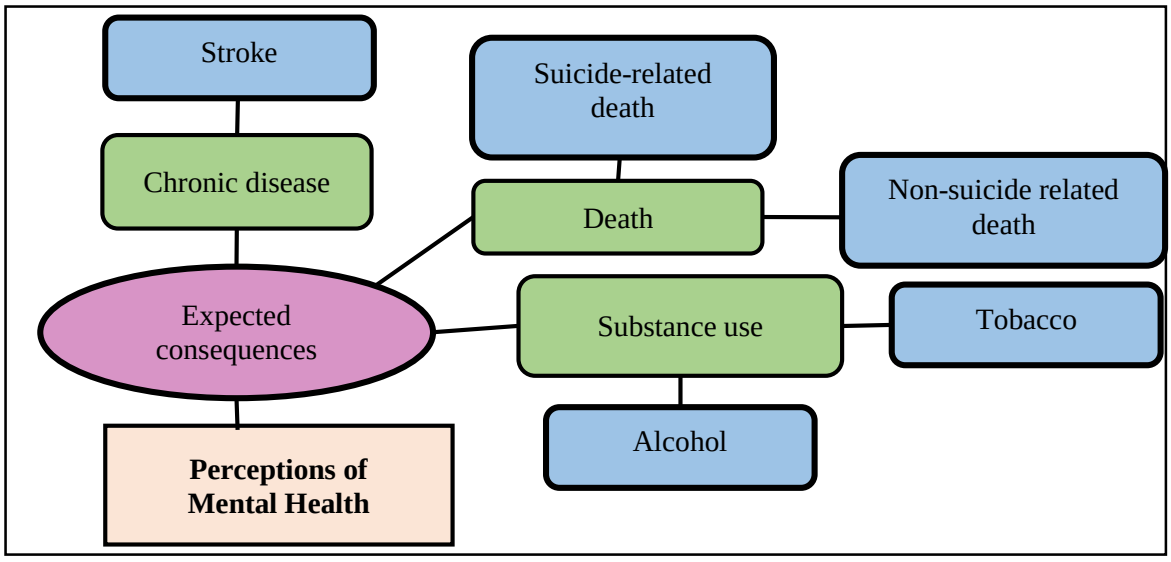
I: *Who will be punished?*
R: *The one who is dead [referring to the young man who committed suicide]. He will be lashed very well at where he has gone to. If someone has left you, why would you have to go and drink poison?* ***[Males, 60+ years, Ga Mashie]***

Some elderly participants in the same group adding their voice revealed that, without being physically ill, mental illness could lead to death. They recounted the pathway to death indicating that divorce would cause persons to think and worry incessantly and then die eventually.

"As for me I see that it is often thinking. Thinking can kill you when you have not been sick ***[Males, 60+ years, Ga Mashie]***

R: *It is because some people's wives have left them. So they start thinking*
R2: *The person will think for a long time. It will worry him and he will die*
[Males, 60+ years, Ga Mashie]

Figure 7.4 Thematic Network for the Global Theme of Expected Consequences of Mental Health Problems



Source: Field Data (Sanuade, 2018)

7.3.1.4 Coping Strategies for Mental illness

During the discussions, participants highlighted substance use, religion and social networks as coping strategies in managing mental health problems.

7.3.1.4.1 Substance use

In coping with mental health problems, participants recounted that people used substances such as alcohol and tobacco. Similar to some narratives indicated above, first, a participant from Agorve remarked that, pain could result from being troubled by an issue or life challenges and alcohol is resorted to in coping with it. Another male participant from Gyegyeano specified coping via forgetting their problems. This finding corroborated the quantitative results, as there was a cross-sectional and longitudinal relationship between alcohol consumption and mental health. Smoking was also another means of dealing with depression.

> *"When you are troubled with something, you might want to drink a little to help deal with the pain".* ***[Males, 60+years, Agorve]***
>
> *"Some of them say that when they are faced with certain challenges, drinking alcohol makes them forget their problems"* ***[Males, 35-59 years, Gyegyeano]***
>
> *"Others too smoke to minimize depression."* ***[Males, 35-59 years, Chanshegu]***

A participant from Gyegyeano however noted the futility of coping with alcohol when he mentioned that, despite resorting to drinking, the pain or problem would remain unsolved

> *"… After drinking the alcohol, you may forget your problem for a while but the next day you will wake up to the reality of your problem."* ***[Males, 35-59 years, Gyegyeano]***

7.3.1.4.2 Religion

It was also mentioned that in dealing with mental health problems, praying about it would resolve problems causing one to worry excessively. An elderly female participant from Gyegyeano recounted her experience of hypertension being as a result of worrying too much. At the end of the narrative, the participant resorts to not worrying about her problems and praying.

> *"… About 2 years ago, I used to have a lot of stomach problems. The stomach sickness only comes when I have a lot of money. When I spend all my money on the sickness in the bid to cure it then I get well. This stomach problem caused me to be admitted and given drip on several occasions. It was through this stomach problem and how to get money to pay my children's school fees that gave me the hypertension. These high class schools take huge school fees. I didn't have money and my children too will be demanding the money. One day I collapsed and was taken to the hospital. The doctor told me that if I don't stop worrying I will be bedridden ..... It was from that time that I stopped worrying. I then started praying about every need of mine."* ***[Females, 60^{+}years, Gyegyeano]***

Some participants shared that consulting spiritualists from the Traditional Religion was one of the ways of dealing with chronic diseases, including mental illness.

> *"…The moment there is a chronic illness or disease [mental illness] in the family, then they attribute it to someone who is causing it. That is the belief and then they consult a spiritualist. And then he too because he wants money, will endorse it."* ***[Males, 60^{+}years, Gyegyeano]***

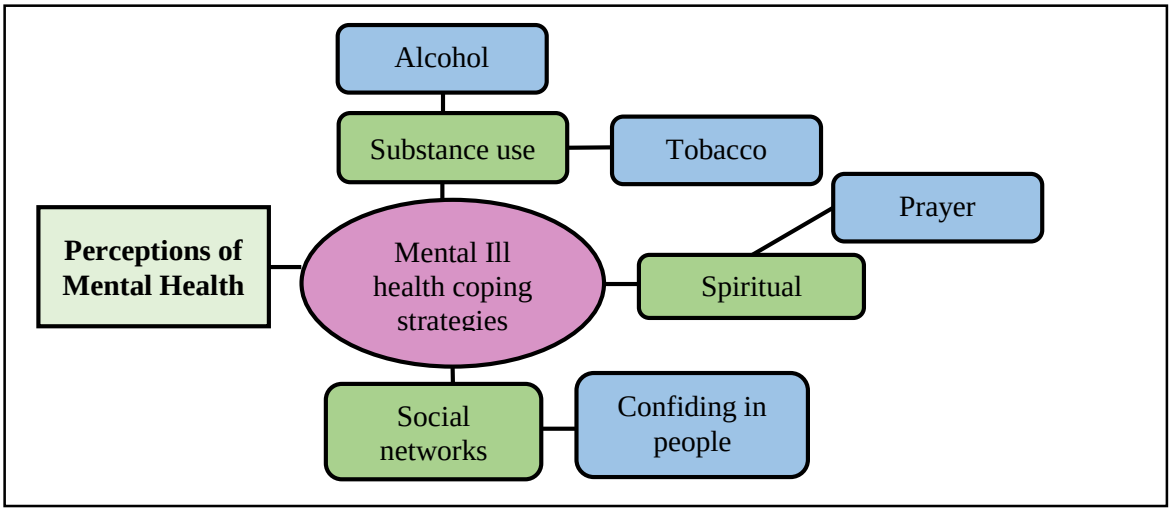
7.3.1.4.3 Social Networks

It emerged from the group discussions that some persons in coping with mental health problems relied on their social networks. They discussed their source of worry with their social network and felt better afterwards. An elderly male participant from Gyegyeano contributed his views:

"There are some people when they get somebody to trust and he tells him what is worrying him….even just by listening to the person alone it appears as if there is a heavy load lifted off your head because you have been able to come out with what is worrying you". ***[Males, 60+years, Gyegyeano]***

Figure 7.5 presents the thematic network for the global theme of mental ill health coping strategies.

Figure 7.5 Thematic Network Showing the Global Theme of Mental Ill health Coping Strategies

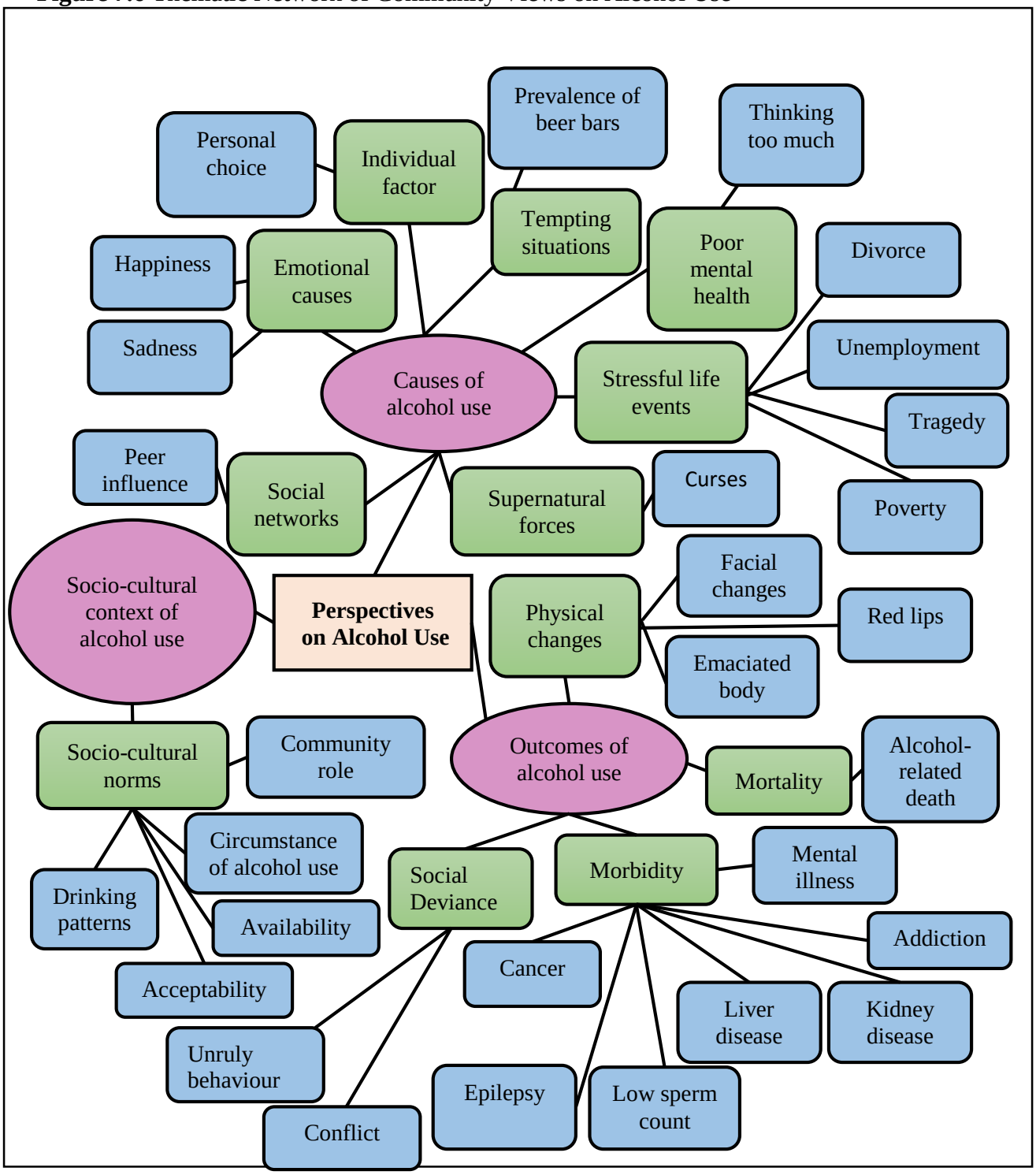


Source: Field Data (Sanuade, 2018)

7.3.2 Community Perceptions of Alcohol Use

Alcohol use is widespread, spanning various cultures. However, levels of use are varied across different contexts hence the need to understand the sociocultural views on alcohol use in communities in Ghana. Figure 7.6 presents a thematic network of local perceptions of alcohol use. Participants in sharing views on alcohol use discussed the contextual issues comprising of sociocultural norms regarding alcohol consumption, views on causes and outcomes of alcohol consumption in the various communities. Table E2 in Appendix E shows frequency tables of themes and codes related to community perceptions of alcohol use.

Figure 7.6 Thematic Network of Community Views on Alcohol Use



Source: Field Data (Sanuade, 2018)

7.3.2.1 The Socio-Cultural Context of Alcohol use

The social context of alcohol consumption largely comprises of sociocultural norms pertaining to its use, which could indicate either its acceptability or unacceptability in various communities and the circumstance of use, whether during a few or many occasions.

The role of alcohol in the community, availability and variety of alcohol as well as patterns of drinking further support the view of community-wide acceptance, which has implications for level of alcohol consumption in the society. Figure 7.7 shows a thematic network for the global theme of the socio-cultural context of alcohol consumption.

7.3.2.1.1 Sociocultural Norms

Some sociocultural norms regarding alcohol use in the various communities were highlighted during the discussions. They comprised of community attitudes or acceptability of alcohol, circumstances of use at the community level and the role of alcohol in the community.

7.3.2.1.2 Acceptability of Alcohol Consumption

In general, participants considered alcohol consumption as not acceptable hence had a negative attitude towards alcohol consumption. They noted that alcohol use was not acceptable because it was not beneficial as it caused abnormal behavior and several health challenges.

> ***I:*** *What are some benefits of alcohol consumption?*
> ***R:*** *Alcohol has no kind of benefit.* ***[Males, 60^{+} years, Chanshegu]***

> *"Whoever drinks alcohol is […]*[16] *because the person can drink and go and engage in some abnormal activities just because the person would be out of his/her senses [after consuming alcohol]."* ***[Females, 18-34 years, Chanshegu]***

> *"…Also, the more alcohol you drink, the more health issues you get."* ***[Males, 18-34 years, Kumasi]***

Some however viewed it as beneficial or had a positive attitude towards alcohol consumption noting advantages such as melting of body fat and protecting one from harbouring evil thoughts. Others stated that consumption was only beneficial when the quality was good, that is natural and unadulterated or when one consumed in small quantities. A respondent noted that alcohol consumption was permitted in the Ghanaian

[16] Word has been omitted because it is in bad taste

society, as there was no rule against it. He further misquoted a passage in the Bible to justify its acceptability in the Christian Religion.

> *"As human beings we need to take in the good alcohols because we have the alcoholic drinks that can harm you. I don't take just any alcoholic drink. Some dilute the alcohol with water."* ***[Males, 18-34, Gyegyeano]***

> *"…But you know what? The best of all the alcohol is the local gin (akpeteshie). For me, I think it's natural alcohol. It's God who made it. That is the alcohol that we should all drink. But those that have been manufactured are those that are causing the sickness. Some people also mix the local gin [Akpeteshie] with certain chemicals, which gives it a different colour and taste. Such drinks are what people also like to drink."* ***[Males, 18-34 years, Kumasi]***

> *"There's no rule against drinking alcohol. Even Jesus Christ, when he took his disciples to Mount Sinai, he gave them a little alcohol before leaving them. So drinking alcohol in itself isn't wrong, taking it too much is what isn't good."* ***[Males, 60^{+} years, Agorve]***

7.3.2.1.3 Circumstances of Use

Participants were asked about circumstances by which people mostly consumed alcohol in the various communities. In the order of counts of mention, participants reported that community members consumed alcohol mainly during funerals, parties, festivals, naming ceremonies, marriage rites, birthdays, and group meetings[17].

> ***I:*** *So in what circumstances do people mostly consume alcohol?*
> ***R****: That one cuts across. Funerals, engagements, get-togethers, socializing. Even as we are here right now, we can decide that oh because we spent a lot of time you would like to give us something and then you just go round and then buy maybe Guinness or Beer (either Star or Club).* ***[Males, 60^{+} years, Gyegyeano]***

Participants also mentioned political rallies and after winning elections as circumstances of alcohol consumption in the communities.

> *"Yes. People drink alcohol at those times too. When we go for political party rallies, everyone requests for the kind of drink he or she wants. When people also win primaries, we drink alcohol. This is what is causing our sickness."* ***[Females, 35-59 years, Tafo]***

> *"Yes. The organizers [of the political rallies] won't give you money to go buy the alcohol. They will buy it for you. And since you don't have money you have no option than to drink the free drink. It's also a strategy employed by the organizers. After you have become drank you will forget the money they promised you for coming out to support a particular political party."* ***[Females, 35-59 years, Gyegyeano]***

[17] See Table E2 in appendix for frequency of codes

Other participants reported the use of alcoholic drinks as aphrodisiacs and for medicinal purposes. A participant particularly noted adonko, a locally produced herbal-based drink as commonly used as an aphrodisiac by persons in the community

> ***R:*** *...And if the person wants to have sex too he can drink.*
> ***R1:*** *Adonko is used to have sex.* ***[Males, 35-59 years, Ga Mashie]***

Pertaining to medicinal use of alcoholic drinks, some participants revealed they were used for removing phlegm from the body, relieve stress, cure piles and serve as a painkiller. They specified that both adults and children used these medicines. As medicines, they were either taken raw or used as an ingredient in concoctions. Male participants from Gyegyeano, Agorve and Chanshegu gave the following views:

> ***I****: So, there are some alcoholic drinks which are medicinal?*
> ***R****: There are some drinks too that help to remove phlegm in your body through visiting the toilet* ***[Males, 18-34 years, Gyegyeano]***

> ***I****: I want to now ask questions about alcoholism. What makes people drink alcohol?*
> ***R****: Some claim it releases stress after hard work so they could sleep. It also reduces bodily pain associated with work.* ***[Males, 18-34 years, Gyegyeano]***

> *"There are certain diseases when you drink alcoholic drinks could suppress the ailment. Example when you have body pains you can take adonko, kakai bitters, and Atinka. When you get any of these at the right amount you could suppress your ailment."* ***[Males, 18-34 years, Gyegyeano]***

> *"Some people drink in order to prevent hernia. When you grow up to a certain age, hernia begins to fight you. Me for instance, I sometimes feel some slight pains here (supposedly pointed out the location), but when I drink then I realise the pain is gone. It may not necessarily be because I'm a drunkard, but in spite of any reason if I do not control myself I may become one."* ***[Males, 35-59 years, Agorve]***

> *"You can also use it to prepare medicine of which you will be giving just a little to the children every morning. But those who have made it a point to just be abusing it, they are the ones not doing the right thing."* ***[Females, 35-59 years, Agorve]***

> *"Some people mix it with certain herbs for medicinal purposes. For instance, to cure piles."* ***[Females, 18-34 years, Chanshegu]***

Another circumstance under which alcohol is used is when some women use it as appetizers after birth. An elderly participant from Tafo, shared that:

> *"Some of us women also use them as appetizers when we give birth. We drink it in order to have appetite for food. That may become a habit."* ***[Females, 60+ years, Tafo]***

Additionally, young and elderly participants from Chanshegu, Gyegyeano and Agorve opined that alcohol was used to gain confidence to settle scores and for conflict resolution.

> *"At times, an individual may want to insult another and drinks alcohol so that when he or she does it they will blame it on alcohol. And it will be that he/she did not intentionally do it."* ***[Females, 18-34 years, Chanshegu]***

> *"Some people who are shy to talk to you anyhow will go and drink alcohol so that they will be bold to insult or fight you."* ***[Females, 60+ years, Gyegyeano]***

> *"When there's a dispute between two people a drink can be used to seal the settling of the misunderstanding; wrong doers [in the community] are also fined with drinks…"* ***[Males, 60+ years, Agorve]***

Comparing circumstances of use across the communities, participants from Chanshegu reported fewer circumstances of alcohol use indicating fewer traditional occasions where alcohol was used. For instance, it was mainly used for marriage rites as part of the bride price, during enskinment and by the warriors during funerals. They indicated low prevalence of vendors and cited mainly pito and akpeteshie as the main drinks used during the various occasions. This largely depicts the level of use of alcohol in the community. In support, an elderly participant asserted that due to Islam, levels of alcohol use was low:

> ***R1:*** *Funerals were the reasons why they drink it.*
> ***R2:*** *Because of religion, they no longer drink it.*
> ***R3:*** *There is no alcohol in this community.*
> ***R3:*** *They go into town to drink it.*
> ***I:*** *Why?... Don't they perform funerals again?*
> ***R4:*** *The funerals are still being performed but now Islam has come.* ***[Females, 60+ years, Chanshegu]***

By contrast, participants from Ga Mashie reported many circumstances of alcohol use in the community indicating several traditional and social gatherings where alcohol was used. They also mentioned a high prevalence of vendors as well as different varieties of alcoholic drinks compared to Chanshegu where a limited variety of alcoholic drinks were indicated.

7.3.2.1.4 Role of Alcohol in the Community

According to Acheampong (1996), historically, alcohol has played an important role in the life of Ghanaians in the south. They were traded, used for traditional rites and to facilitate social cohesion. In this study, communities in both northern and southern Ghana were studied to find out the role alcohol played in contemporary times. A participant from Agorve reported that individuals consumed alcohol during funerals and during rites of passage such as marriage rites, with alcoholic drinks being presented as part of the rites. With traditional religious prayers, libations were poured using alcohol.

> *"It is mainly at funerals that people really drink. At certain functions like marriage ceremonies they only present certain drinks as part of the rite; the drink is not akpeteshie per say. At naming ceremonies, alcohol is used when naming the baby. When you go to the fetish priest too libation is poured."* ***[Females, 60+ years, Agorve]***

A participant from Chanshegu revealed that alcohol as part of items for bride wealth payment during marriage rites was considered indispensable and families insisted on its provision in the face of conflicting religious beliefs regarding alcohol use.

> ***R:*** *There are times that someone wants to wed and it becomes compulsory they buy pito.*
> ***I:*** *Is it among the Dagombas?*
> ***R:*** *Even if you are a Muslim and it happens that you want to wed a Dagomba man's daughter, you will have to provide money to buy the alcohol."* ***[Females, 35-59 years, Chanshegu]***

The role of alcohol in the community was seen with the performance of other rites of passage such as naming ceremonies:

> *"At naming ceremonies alcohol is used when naming the baby."* ***[Females, 60+ years, Agorve]***

7.3.2.1.5 Availability

The respective focus groups discussed the type of alcoholic drinks available, subpopulations most or least likely to consume alcohol and the vending points of alcohol in the communities. With respect to types of alcoholic drinks, various home brewed, local and imported company produced alcoholic drinks were reported to be available and mostly

consumed in the communities. [18]They comprised of Akpeteshie, Adonko bitters, Kasapreko Alomo bitters, Club beer, Pito, Guinness beer, Kakai bitters, Joy Dadi bitters, Agya Appiah bitters, Striker sachet (200ml) alcohol, Palm wine, in order of number of mentions in the various group discussions. Communities such as Ga Mashie, Gyegyeano and Tafo reported more varieties of alcoholic drinks available in the communities than others. This could be because these communities were either urbanised or close to urban centers with easier access to the variety of brands. Particularly, participants from Ga Mashie made mention of the prevalence of beer bars and table top vending points which serve these drinks. They mentioned that over time, these vending points have increased with food vendors selling pocket-sized alcohol sachets in addition to food.

> *"…Now if you are walking through every corner you will see people sitting down selling drinks. You will see someone who has displayed a small table selling drinks. If the person gets money, he will buy two cartons of beer to sell."* ***[Females, 60+ years, Ga Mashie]***

> ***R2:*** *You see, the thing is that at first the beer bars were not plenty here. Local gin bar was not plenty here. But now even if someone has prepared banku and stew and is selling, the person sells alcohol too. This sachet drink will be sold beside it.*
> ***R3:*** *and the one being poured into the glass.* ***[Females, 60+ years, Ga Mashie]***

The participants further noted that rich elderly persons mostly consumed foreign produced drinks such as whisky, brandy, champagne and local company produced drinks such as Club beer and Guinness. The poor mostly consumed the local gin, Akpeteshie.

> *"The one who doesn't have enough [money] buys in tots of the local one [Akpeteshie] and those who have enough buy Club, Orijin, Smirnoff, Guinness. Basically those in the packaged bottles. Those who have a lot buy champagnes."* ***[Males, 18-34 years, Gyegyeano]***

[18] Home brewed traditional drinks include Palm wine, Akpeteshie and Pito. Local company produced alcoholic beverages comprise of Agya Appiah, Biegya, Joy Dadi, Kakai, Kamame, Alomo, Adonko, Kalahari Kiss, Joy Twede3 Ginger Bitters, Choice, Famekor, Fighter, Orijin Bitters, Club beer, Star beer, Smirnoff ice beer, Guinness beer. Imported company produced alcoholic beverages include various brands of whisky, brandy and champagnes. See Table F1, Appendix F for detailed description and classification of the various alcoholic beverages available in the communities.

7.3.2.1.6 Patterns of Drinking

Participants distinguished between levels of alcohol use in the various communities, which are normal or moderate and excessive use of alcohol. From the narratives, normal consumption implied not getting drunk and excessive use meant drinking without stopping, in essence getting drunk. In reporting excessive drinking among young men and women in their community, a participant from Gyegeano indicated that:

> *"The young men and women are drinking too much. There's Kakai [meaning monster]. How can you name an alcoholic drink monster? So it means it catches people. No wonder it's destroying their lives."* **[Females, 60^{+} years, Gyegyeano]**

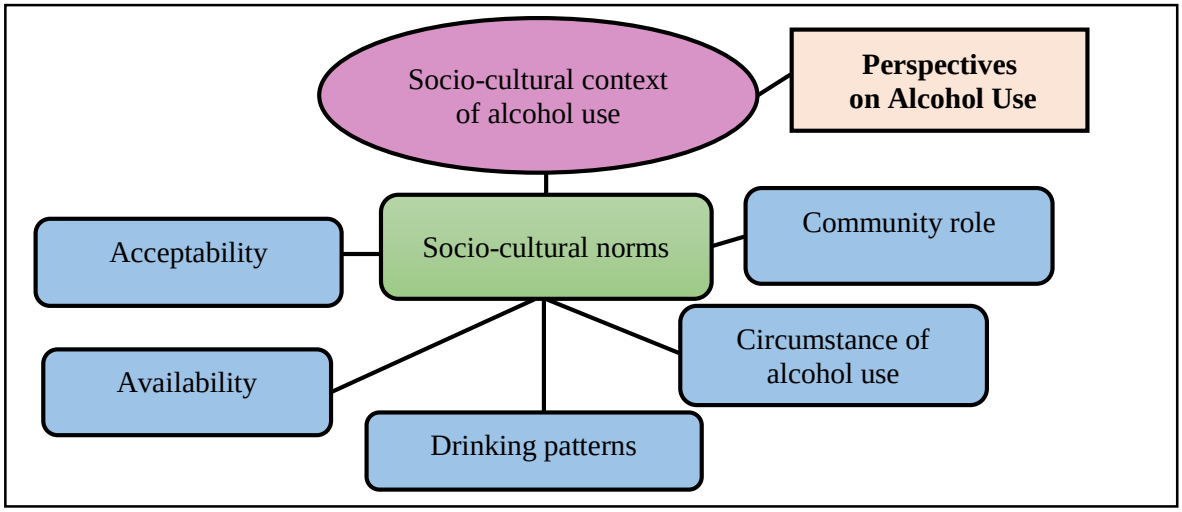
Participants indicated hazardous use of alcohol, that is, drinking excessively without eating in the community:

> *"I met him standing with this man when I was coming. They asked me to join them. I said I was going to buy some food to eat. They insisted I still joined them then I can buy the food afterwards. They drink excessively without eating."* ***[Males, 60^{+} years, Ga Mashie]***

> *"... Also there are some people who just wake up at dawn to go and say to someone [to the vendor], "today you have to sell." He's just going to drink. He doesn't have food to eat too. He will keep on drinking without stopping."* ***[Females, 60^{+} years, Ga Mashie]***

Figure 7.7 depicts the thematic network on the global theme of socio-cultural context of alcohol use in the study communities discussed by participants during the FGDs

Figure 7.7 Thematic Network on the Description of the Socio-cultural Context of Alcohol Use in the Study Communities



Source: Field Data (Sanuade, 2018)

7.3.2.2 Causes of Alcohol Consumption

In the study communities, the various groups identified stressful life events, emotional causes, individual factors, biological and or a learned behaviour from one's family, tempting situations, social networks, poor mental health and supernatural forces as being causes of alcohol use.

7.3.2.2.1 Stressful Life Events

Discussants from the various contexts revealed that stressful life events such as divorce, unemployment, poverty, heartbreak, and tragedy caused people to consume alcohol. Similarly, in the quantitative findings stressful life events such as poverty (belonging to the poorest wealth quintile, not having money to buy food, having a bad household financial situation) predicted people to consume alcohol over time. Some participants in the focus groups intimated that:

> ***I**: What are some of the issues in life that make people drink alcohol here?*
> ***R**: Divorce is one of them.*
> ***R**: Another is poverty.*
> ***R**: Another is… not having a job.* ***[Males, 35-59 years, Tafo]***

> *"Some people may be troubled with something which will be causing them pain. So, they drink alcohol in order to get such things off their minds."* ***[Females, 60+ years, Agorve]***

> *"Some also drink because they have been jilted by women. So the idea is to drink and sleep and forget about the hurt. But when they become sober the hurt or pain is still there."* ***[Females, 35-59 years, Gyegyeano]***

> *"For some people, it is when they are troubled. There was a pastor whose wife and two children drowned in a river so he took to drinking."* ***[Males, 35-59 years, Agorve]***

7.3.2.2.2 Poor Mental Health

To some participants, thinking or worrying too much, which is a local term for depression or anxiety caused people to drink alcohol. A participant from Tafo asserted that worrying too much about issues in life made people drink alcohol in the community.

> ***I**: What are some of the issues in life that make people drink alcohol here?*
> ***R**: Another is worrying too much...* ***[Males, 35-59 years, Tafo]***

Contrastingly, the quantitative results showed that depression did not cause people to consume alcohol over time.

7.3.2.2.3 Emotional Causes

Other participants specified happiness and sadness as causes of alcohol use in the communities. In relation to happiness, a participant from Gyegyeano asserted that most often it is out of happiness that people consume alcohol rather than sadness. Moreover, with sadness, which is precipitated by certain stressful life events, alcohol is resorted to, to cope with emotions accompanying the event. This result corroborates Akyeampong's (1995) findings from a study on popular literature and highlife songs that drinking when in pain is a fact of Ghanaian history and culture. A second participant from Ga Mashie repeated a proverb to first support the view that excitement causes people to drink, then to indicate the extent of acceptance of alcohol consumption among community members. She however expressed strong opposition to the consumption of alcohol by calling for a ban on it.

> *"Most people drink alcohol out of happiness. It's only a few people who drink because they are sad. More people drink alcohol as a result of happiness. I think about 99% of people who drink do so because they are in a good mood. It's only on few occasions that people drink alcohol because of some misfortune. For example, when a woman leaves you for someone else you may drink some alcohol. You forget about the hurt for a while. The next day you go to work and you are preoccupied but when you return home you feel the hurt again and go in for some drinks to numb the pain in your heart. But most drink it because they are happy"* ***[Males, 35-59 years, Gyegyeano]***

> *R: Excitement, worrying and other things*
> *R2: Please, the Gas have a saying that that "excitement is found in the bottle". Left to me alone, it should be banned so that people will stop getting drunk.* ***[Females, 18-34 years, Ga Mashie]***

7.3.2.2.4 Social Networks

From the discussions, an elderly participant from Gyegyeano shared the view that peer influence from one's social network caused persons to drink alcohol.

> *"Some also drink because of peer pressure."* ***[Females, 60+ years, Gyegyeano]***

7.3.2.2.5 Supernatural Forces

Again, some focus groups attributed the cause of alcohol consumption to spiritual forces, curses and personal choice of individuals. This finding is in consonance with Acheampong's (1996) study, which showed that psychiatric practice in colonial Ghana saw alcoholism as spiritually caused and so a spiritual illness. He further adds that the Ghanaian society defines health as not only the wellbeing of the mind and body but also of the spirit. As a spiritual illness, alcoholism requires a spiritually experienced faith healer to initiate the healing process. The participant further reveals that in comparison to individually initiated drinking, spiritually caused alcoholism in essence is uncontrollable since it began not on the individual's own accord. To illustrate, participants from Tafo and Ga Mashie stated that:

> *"There are two types. We have the spiritual and the physical. If someone causes you to start drinking spiritually, you can never drink to your fill. You drink anytime you get the chance. But for the physical one, it is on your own accord that you will drink."* ***[Males, 35-59 years, Tafo]***

> ***I:*** *So it means that people drink when it isn't because they are cursed.*
> ***R:*** *Yes. Some do it out of their own will. With others also they have been cursed.* ***[Females, 35-59 years, Ga Mashie]***

> ***R:*** *Some of them are demon-caused. Drinking too much alcohol can also cause epilepsy."****[Males, 60+ years, Tafo]***

7.3.2.2.6 Individual Choice

A common view shared across the focus groups in all the communities was that alcohol use is a personal choice, that is, people sometimes decide on their own to consume alcohol. An adult participant from Chanshegu had this to say:

> *"Drinking of alcohol is based on an individual's choice..."* ***[Males, 35-59 years, Chanshegu]***

7.3.2.2.7 Biological factors and learned behaviour

A section of elderly participants from Gyegyeano revealed that alcohol consumption was due to biological causes and or was a behaviour learned because the individuals belonged to families that consumed alcohol excessively:

R3: There are people who do habitual drinking. Sometimes too it's from the family. For some families they booze so …..
R2: …When you are born into it you become part of it
R3: Yes ***[Males, 60+ years, Gyegyeano]***

7.3.2.2.8 Tempting Situations

A participant from Ga Mashie indicated that tempting situations in the form of large number of beer bars and outdoor table top vending points caused people to consume alcohol

R: *The drinking bars are too much [too many].*
I: *The bars are plenty huh?*
R: *Temptation [Laughter]* ***[Males, 18-34 years, Ga Mashie]***

A participant from an elderly female focus group in Ga Mashie supported the assertion of high number of beer bars in Ga Mashie by the adult male participant indicating that even food vendors who were not known to sell alcohol now sell pocket-size (200ml), less expensive sachet drinks in addition to food making it ubiquitous in the community. She stated that:

R2: *You see, the thing is that at first the beer bars were not plenty here. Local gin bar was not plenty here. But now even if someone has prepared banku and stew and is selling, the person sells alcohol too. This sachet drink will be sold beside it.*
R3: *… And the one being poured into the glass* ***[Females, 60+ years, Ga Mashie]***

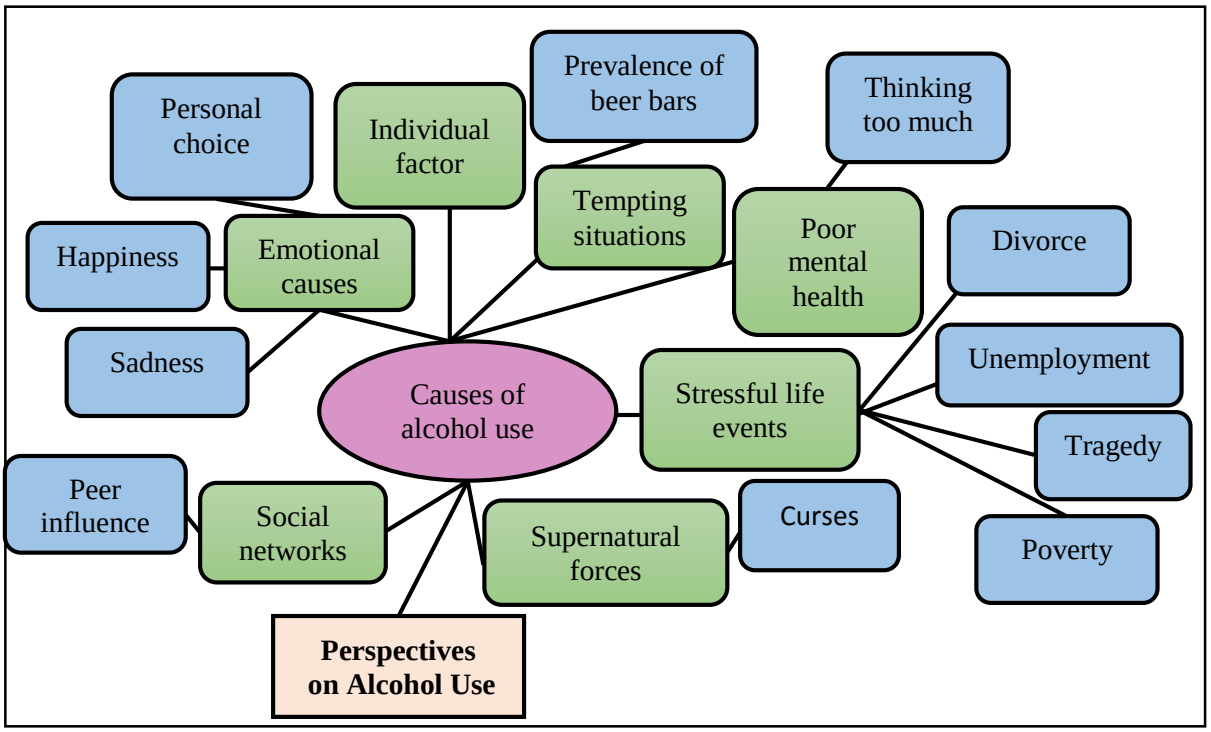
R1*: … I don't understand why the government allows all these drinks to be on the market.*
R3*: But you can resist the temptation to drink so that shouldn't worry you. If you know it's not good, don't buy it.* ***[Females, 60+ years, Kumasi]***

Elderly participants bemoaned the increased availability of alcoholic drinks and beer bars in various communities, which was not the case some decades ago. To them, the increased availability has caused an increased prevalence of alcohol consumption.

*"In the olden days there was license. Those who sell beer and even local gin. When we were young local gin used to be licensed so local gin wasn't just sold. Now it has become a fashion". [****Females, 60+ years, Ga Mashie****]*

Figure 7.8 depicts the thematic network on the global theme of causes of alcohol use discussed by participants during the FGDs.

Figure 7.8 Thematic Network on the Causes of Alcohol use



Source: Field Data (Sanuade, 2018)

7.3.2.3 Outcomes of Alcohol use and Abuse

Participants in the various focus groups outlined social deviance, morbidity and mortality as the consequence of alcohol consumption. Concerning morbidity, alcohol addiction, mental illness, low sperm count chronic diseases were mentioned as outcomes. Other consequences were marked physical or bodily changes of some alcohol users. Regarding mortality, participants indicated alcohol-related deaths as an outcome of alcohol abuse.

7.3.2.3.1 Social Deviance

The outcome of alcohol use as described by participants consists of speech and behaviour, which is outside acceptable societal norms. Unruly behaviour and speech were indicated to sometimes breed violence and conflict. For instance, participants from Tafo and Gyegyeano mentioned that:

> *"Alcohol does not make you shy. It makes people also talk a lot as if they are mad."* ***[Females, 60+ years, Gyegyeano]***
> "*It also makes you act like a mad man."* ***[Females, 18-34 years, Tafo]***

"A person who drinks can just shout for no reason and behave unruly. Some of them even fight." ***[Females, 60+ years, Tafo]***

7.3.2.3.2 Morbidity

Discussants mentioned alcohol addiction as a morbid outcome of alcohol use. An elderly male participant from Chanshegu described the process of addiction indicating that there must first be a stressful situation, which would cause the individual to think a lot, and in coping with it, consumption of alcohol increases over time making the individual an addict.

"…Because of that it can happen and you will drink it to an extent that, just like he earlier on said, if there is something that bothers you, after drinking, you will forget about it. Tomorrow, you do same. By the time you realize, you will be an addict." ***[Males, 60+ years, Chanshegu]***

Participants in the FGDs linked alcohol use to mental health. They reported that alcohol was used to the point of poor mental health when stressful life events such as divorce occurred. An elderly participant from Tafo indicated this, when he said that:

I*: What about divorce?*
R*: As for that one, you will drink till you get mad.* ***[Males, 60+ years, Tafo]***

Repeatedly in the various focus groups, discussions brought to light chronic diseases such as stroke, hypertension, diabetes, epilepsy, cancer, kidney and liver disease as consequences of alcohol use. The following quotes illustrate the basic theme:

R*: Yes, the stroke can be caused by the alcohol.*
I*: Does alcoholism cause any chronic disease?*
R*: It can cause stroke.*
I*: What else?*
R*: High blood pressure.*
I*: What else?*
R*: It may also cause diabetes.*
R*: You may even get stomach ulcer* ***[Males, 60+ years, Tafo]***

To some participants, excessive consumption of alcohol led to epilepsy. An elderly participant from Ga Mashie indicated that:

"Drinking too much alcohol can also cause epilepsy" ***[Males, 60+ years, Ga Mashie]***

An elderly participant from Tafo shared the view that alcohol use caused damage to the kidney and liver.

"Yes, because it affects your kidney and your liver." ***[Females, 60+ years, Tafo]***

To some participants, cancer was the outcome of alcohol use. An elderly male participant from Tafo contributed the view that it is not just consuming alcohol that leads to cancer but consuming ones with high alcoholic content.

> ***R**: There are many types of cancer. There is throat, there is breast and others.*
> ***I**: Okay. So what causes it?*
> ***R**: Smoking*
> ***I**: What else?*
> ***R**: And alcohol. The strong ones.* ***[Males, 60^{+} years, Tafo]***

Among the outcomes of alcohol use, an adult male participant from Agorve pointed out low sperm count.

> *"It also gives low sperm count."* ***[Males, 18-34 years, Agorve]***

7.3.2.3.3 Physical Changes

Elderly and young female participants from four out of the five communities studied described physical and physiological changes that occurred among persons who used alcohol excessively in their communities. They indicated facial and bodily changes. The following quotes illustrate the changes:

> *"There are so many ways. If you know someone who drinks a lot, you will notice that their physique changes. Alcoholics tell us that the alcohol strengthens their intestines. That's what they tell us."* ***[Males, 35-59 years, Gyegyeano]***

> *"It makes them lose blood. It also makes their face look a certain way with red lips. So, you will be able to tell that a person drinks the moment you see them."* ***[Females, 18-34 years, Agorve]***

> *"Yes! It has a serious implication. It disturbs some people but with others it does not do them anything. Look, one of my uncles was into alcohol and it emaciated his body."* ***[Females, 35-59 years, Agorve]***

> *"It affects the stomach and also wanes the beauty or handsomeness of the person. It can also make someone's lips to be red."* ***[Females, 18-34 years, Tafo]***

> *"You will see a fine young looking man. The in-take of alcohol can change his appearance. One day I saw a young man sitting there and I was asking myself who that person was. Then I realized it was that handsome looking young man I always knew. The alcohol had changed his appearance. Such a very handsome man. He had changed."* ***[Females, 60^{+} years, Gyegyeano]***

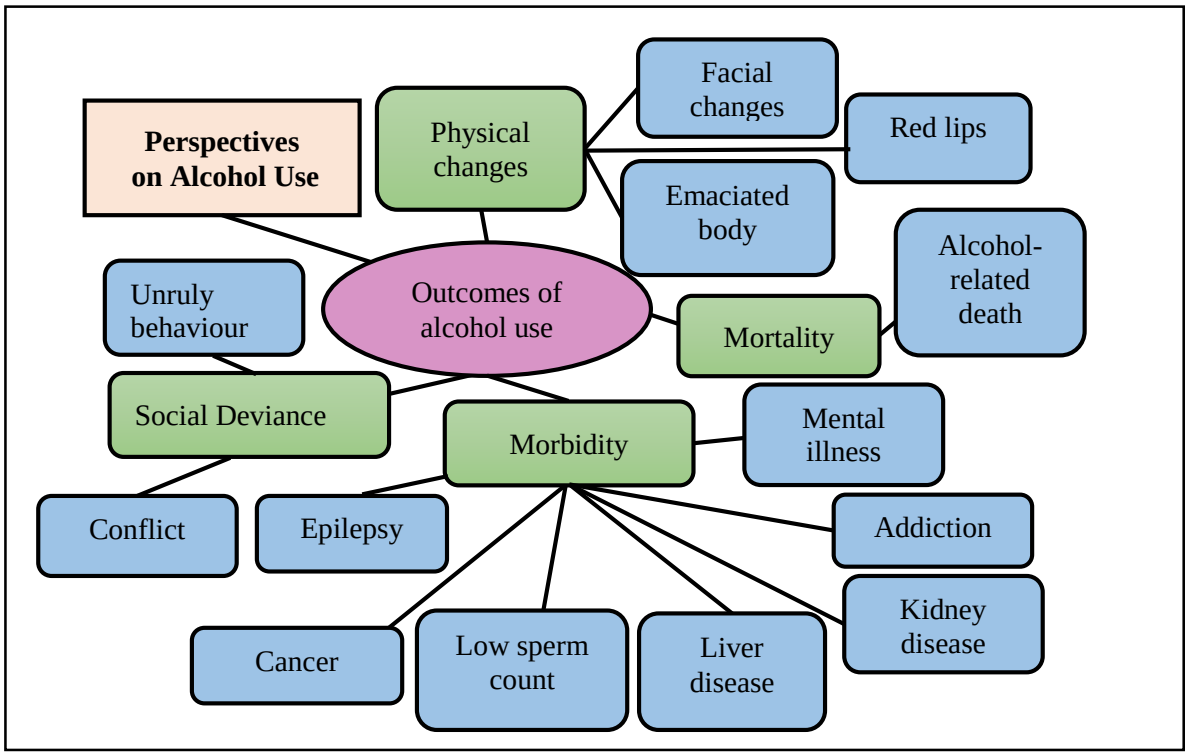
7.3.2.3.4 Mortality

A male participant from Gyegyeano explained the process of death from excessive alcohol use. He revealed that alcohol impeded the functioning of the liver and subsequently resulted in alcohol use-related death.

> *"….In the same way when your kidney is unable to ehmmm…squeeze the dirt out of the system, for you to urinate it becomes what we call sclerosis. It hardens. It becomes hard. Which means it doesn't work anymore. So your whole body will be filled with impurities or poison and then it will go into your blood stream and poison you. You will be walking and then all of a sudden you fall down and die. So too much alcohol can kill you. It will destroy your internal organs. That is the liver and the kidney."* ***[Males, 60+ years, Gyegyeano***

Figure 7.9 depicts a thematic network on the theme of outcomes of alcohol use discussed by participants during the FGDs.

Figure 7.9 Thematic Network on the Outcomes of Alcohol Use



Source: Field Data (Sanuade, 2018)

7.3.2.4 Emergent Themes

Themes, which were unanticipated, recurred in a number of the focus group discussions. Inductive analysis of the data revealed themes of children as customers of alcoholic beverages, substance abuse with co-use of alcohol and marijuana, tramadol, nails in alcoholic drinks, use of psychoactive cough syrup by some members of the various communities.

7.3.2.4.1 Non-adherence to alcohol consumption laws

During some focus group discussions, it was revealed that children were sometimes sent to buy alcoholic drinks by adults, either parents or neighbours. Other times they bought with their own money under the guise of being sent by an adult and consumed the alcoholic drinks. In addition, alcoholic beverage sellers sell alcohol drinks to children. Elderly participants from Ga Mashie and Gyegyeano mentioned that:

> *"...So they send the little children. Nowadays, if a child is sent to go buy the drinks, the child has his/her own money so if the child wants some, he will go and buy it and drink it. He will say that he was sent".* ***[Females, 60+ years, Ga Mashie]***

> *"What disturbs me most is how school children from the age of 10 buy the alcoholic drinks that come in a sachet. I was so disturbed that day. How can I go and tell the seller not to sell to the children. The seller might accuse me of not wanting his/her business to flourish."* ***[Females, 60+ years, Gyegyeano]***

7.3.2.4.2 Substance Abuse

It was revealed during the discussions that some persons in some of the communities abused substances. These were combinations of marijuana with alcohol locally known as "Atemuda" which means "Judgement day" to express the harmful strength of the combination. A participant from Tafo stated:

> *"There's Adonko, there's Bie Gya, local gin [akpeteshie], Guinness. Ginseng, Larger Beers, Atemuda* ***[Males, 35-59 years, Tafo]***

> *"We have local gin (akpeteshie). There's also a local gin that's prepared with marijuana."* ***[Males, 60+ years, Tafo]***

> *"There is one being sold which is called marijuana drink. Do you know it?"* ***[Females, 60+ years, Ga Mashie]***

Other substances were cough syrups for example benylin cough syrup, which achieved psychoactive effects on its users if taken in excess. It was indicated that they were usually prescribed for children but now some adults in the community consume them. Some young female participants from Ga Mashie stated:

> ***R1:*** *There is something, which is not alcohol, but people drink it more than the alcoholic drinks*
> ***R2:*** *Cough syrup*
> ***R1:*** *It has now become a medicine for adults.*
> ***R1:*** *It is being given to children…when you drink it, it makes you sleep.* ***[Females, 18-34 years, Ga Mashie]***
>
> ***I:*** *What did you say its name was?*
> ***R:*** *'Benylin', 'Cetralin' [most of the respondents said it at the same time]*

Mention was made of using prescription medication such as Tramadol, a painkiller mixed with any kind of drink including alcohol:

> **R5*:*** *The youth now drink Tramadol… they buy the tramadol and mix any kind of drink and consume."*
> **All:** *When they drink it, you will think the person is suffering from epilepsy. Somebody drunk it and his mouth was foaming. And it was due to the tramadol."* ***[Females, 18-34 years, Chanshegu]***

Some focus group discussants reported nails in alcoholic drinks:

> *"They put nails in the alcoholic drinks overnight".* ***[Females, 18-34 years, Chanshegu]***

7.4 Discussion

Findings on understandings of alcohol use and mental health are discussed in this section. They would be deliberated on from the perspective of the theory of Social Construction and related to other research on alcohol use and mental health. The findings border on the themes generated on alcohol use and mental health. Themes on mental health include characterisation of mental health, causes of mental health problems, expected consequences of poor mental health and mental ill health coping strategies. Thereafter, themes on alcohol use to be discussed comprise of the socio-cultural context of alcohol consumption, causes of alcohol use, and outcomes of alcohol use.

7.4.1 Community Perceptions of Mental Health

In sharing their perspectives on mental health, participants characterised mental health by defining mental health, classifying mental illness into types by their symptoms and describing behaviour associated with the types of mental illness. Further, participants mentioned varied causes of mental health problems including supernatural causes, biological factors, stressful life events and substance use. In coping with mental illness, the groups mentioned strategies such as spiritual, substance use and reliance on social networks. Finally, they indicated some expected consequences of poor mental health to include chronic diseases and death.

7.4.1.1 Characterisation of Mental Health

In line with the Social Construction theory, the cultural meanings of mental health and illness were noted in participants' characterisation of mental health. They did this by deliberating on their understanding of what constitutes mental health, classifying mental illness into severity levels by their symptoms, and describing behaviour associated with the types of mental illness. They noted depression as a less severe type of mental illness and seemed to describe some psychotic symptoms, which they classified as severe mental illness. They described symptoms of depression as comprising of feelings of sadness, experiencing insomnia, and weight loss without being on diet which were three out of the nine symptoms specified in the DSM-IV third revision diagnostic and statistical manual (APA, 2000). They also presented general local concepts of CMDs using the terms 'adwendwen' thinking too much and 'ɔhaw' worrying too much. Similar terms have been reported in other qualitative studies among the Akan and Ewe in Ghana (Avotri & Walters, 2001; Opare-Henaku & Utsey, 2017), as well as among persons in Harare, Zimbabwe (Patel & Stein, 2015a), Eritrea (Sweetland et al., 2014), and four ethnic groups in South Sudan, Democratic Republic of Congo (DRC) and Burundi (Ventevogel et al., 2013).

Respondents used some labels, which expressed negative metaphorical notions of severe mental illness. They included ‘eti yareɛ’ or ‘adwen mu yare’, that is, one is sick in the head, or the person’s head or mind not working well. Another local term was also used by the focus group discussants in this study to refer to severe mental illness ‘abɔdam’, which means madness or lunacy. Opare-Henaku and Utsey's (2017) study participants in explaining the term ‘abɔdam’ indicated that persons with severe mental illness behave like dogs hence they did not use this term for the mentally ill person(s) when his /her relative was around as it was derogatory.

Further, the participants viewed individuals with severe mental illness as dangerous and insane and associated mental illness with violent crimes. Studies analysing media reportage on mental health in Ghana have shown similar views as various media sources report on crimes committed by persons with mental disorders leaving out the factors that precipitated the crime (Mfoafo-M’Carthy et al., 2016; Dzokoto et al., 2018; Adinkrah, 2019). By this, they shape opinions of bias and perpetuate stigmatization of persons with mental disorders. Correspondingly, descriptions as aggressive or dangerous behaviour of persons with severe illness has also been reported in other studies in other African countries and Europe (Ventevogel et al., 2013; Varshney et al., 2016). According to Varshney et al., (2016), this is a biased view which contributes to sufferers being stigmatised since most violent crimes were rather committed by non-mentally ill persons. They cited a meta-analysis which reported that, a number of patients with schizophrenia were to be detained as they were evaluated to be at high risk of violence from other persons (Large et al., 2011 as cited in Varshney et al., 2016). Viewing mentally ill persons as dangerous may affect societies support for certain public policies (Conrad & Barker, 2010; Varshney et al., 2016), for instance, public support for forced confinement and treatment of persons with severe mental illness instead of community integration of persons with severe mental illness. This

may also influence some sufferers' decisions not to disclose mental illness nor receive treatment (Varshney et al., 2016).

These findings therefore affirm the Social Construction theory's stipulation that cultural meanings of mental illness differ from biomedical notions in that social and cultural meanings attached to mental illness by the various communities, did not directly stem from the biological nature of mental illness but rather from culturally derived representations.

7.4.1.2 Causes of Mental Health Problems

Further, participants attributed causes of mental health problems to supernatural, biological factors, stressful life events and substance use. On the supernatural factors witchcraft, family curses and evil spirits were commonly mentioned in the various groups as causes of mental illness. In addition, they believed that biologically, mental illness could be passed on through the family line (hereditary) and brought about by chronic conditions as well. These were similar to findings from Patel et al. (1995), Kyei et al. (2014), Opare-Henaku and Utsey (2017), Kpobi and Swartz (2018) and Adinkrah (2019) who affirm that mental disorders are attributed to supernatural forces in SSA settings, particularly Ghana. Mental disorders are stigmatised as some view it as an outcome of divine wrath and the comeuppance of individuals with poor mental health for violating societal rules or taboos (Adinkrah, 2019). The qualitative studies reviewed also mention socio-demographic and economic factors such as stressful life events of deprivation, financial problems, divorce and unemployment as leading to poor mental health (Kyei et al., 2014; Opare-Henaku & Utsey, 2017; Kpobi & Swartz, 2018; Adinkrah, 2019). For psychoactive substance use, alcohol and tobacco were noted as causes of mental illness by the focus group participants.

Affirmed in this study and reported by Omonzejele (2008) and Patel and Stein (2015), is the dual perception of disease causation—natural (biomedical) and unnatural (supernatural) by African societies, which is distinct from Western biomedical

conceptualisations. Patel (1995) additionally discloses that the perception of supernatural aetiology of mental illness stems from traditional African religious beliefs, which are commonly shared by many African societies. A qualitative study by Ventevogel et al. (2013) who conducted 31 focus group discussions among participants from communities in South Sudan, DRC, and Burundi on local concepts of mental illness confirm this by reporting witchcraft, evil spirits and curses as being causes of mental illness. Curses of mental illness could be pronounced on persons as a consequence of moral failure in terms of breaking taboos or offending ancestral, evil spirits or other individuals (Read et al., 2009; Arias et al., 2016; Osafo, 2016; Opare-Henaku & Utsey, 2017; Kpobi & Swartz, 2018). In consonance with findings from this study, other evidence have similarly noted stressful life situations whether chronic or acute as preceding mental illness. For instance, poverty (Patel & Stein, 2015), financial challenges (Ekanayake et al., 2012; Opare-Henaku & Utsey, 2017) and unemployment (de-Graft Aikins & Ofori-Atta, 2007). Food insecurity, defined by a participant as having to depend on another for food, was stated as a cause of mental ill health in this study. This finding was affirmed by Weaver & Hadley's (2009) systematic review of 11 qualitative studies which identified food insecurity as a stressful, anxious and shameful experience hence leading to poor mental health. In addition, psychoactive substances as alcohol use and cannabis (Patel et al., 1995; Read et al., 2009; Arias et al., 2016; Opare-Henaku & Utsey, 2017) were also mentioned as being linked to poor mental health in various qualitative studies.

With the global theme of coping with mental illness, various groups in the study communities noted the basic themes of alcohol or cannabis use, prayer and reliance on peers as spiritual, substance use and social network coping strategies respectively. A number of qualitative studies have supported the use of substances such as alcohol and tobacco to cope with stress and mental illness (Marimbe et al., 2016; Haighton et al., 2018; Mackinnon et al., 2019). Kyei et al. (2014) inform that, the cultural construction of mental illness in the

Ghanaian society which is supernatural causation, perceive that supernatural problems must be resolved supernaturally. As such applying biomedical healing to spiritually caused mental illness is considered ineffective among both individuals and faith healers (Kpobi & Swartz, 2018). A review of both qualitative and quantitative evidence in the United Kingdom explained the influence of spirituality on mental health stating that it helps persons to cope with poor mental health by offering meaning, purpose and hope in life (Cornah, 2006b). Similar findings were reported by Marimbe et al. (2016) in their study of family caregivers of persons with mental disorders in Zimbabwe. According to Cornah (2006), social networks serve to offer financial and spiritual support. They also provide emotional support by being understanding and showing empathy which helps persons to cope with stressful situations and improve their mental health.

7.4.1.3 Consequences of Poor Mental Health

Finally, participants indicated some expected consequences of poor mental health to include substance use, chronic disease, and suicide-related and non-suicide related deaths.

7.4.2 Community Perceptions of Alcohol Consumption

Community perceptions of alcohol consumption bordered on the socio-cultural context of alcohol use, causes and consequences of alcohol consumption. On the sociocultural context of alcohol use, focus group participants highlighted various sociocultural norms, which increased or decreased alcohol consumption. Pertaining to the causes of alcohol consumption, emotional, individual choice, supernatural, stressful life events, tempting situations, poor mental health and social networks were outlined. Outcomes of consumption of alcohol included morbidity and mortality.

7.4.2.1 The Socio-Cultural Context of Alcohol Consumption

There are variations in consumption of alcohol across cultures (Sudhinaraset et al., 2016). The Social Construction theory applied to alcohol use assert that drinking and

drunkenness are learned in societies (Reinarman, 1988; Gladwell, 2010). Based on common beliefs or cultural understandings of how alcohol should be used and interactions, people conform to expected societal alcohol behaviour. This therefore accounts for the variations in the level of consumption. Participants identified various sociocultural norms pertaining to acceptability, community role of alcohol, circumstance of alcohol consumption, availability of alcohol and drinking patterns.

While most participants viewed alcohol consumption as not acceptable because it caused abnormal behaviour and health challenges, a few noted that it was beneficial on condition that it was natural (local gin), unadulterated and consumed moderately. They highlighted its perceived advantage of melting body fat and protecting one from harbouring evil thoughts. The widespread view of its unacceptability as a result of abnormal behaviour its consumers portray and health challenges they face point to the prevalence of alcohol abuse in the various communities studied. As shown by some qualitative studies, this depicts a changed sociocultural context of alcohol use where decades prior to independence in Ghana, traditional systems of rules and regulations guarded alcohol use (Adomakoh, 1976; Akyeampong, 1994, 1995, 1996). First, drinking by young men, even in their 20s were frowned upon (Akyeampong, 1996). There was mostly communal drinking and drinking in solitude was considered antisocial and discouraged as the tendency for alcohol abuse was high in solitude drinking (Akyeampong, 1996). Recent evidence has affirmed solitude and binge drinking as leading to progression in drinking and consequently alcohol use disorders (Patel, 2007a; Mackinnon et al., 2019). Drunkenness was stigmatised and the individual's family or clan could be stigmatised as drunkards. Post-independence economic and political change influenced patterns of alcohol consumption (Adomakoh, 1976; Akyeampong, 1996). The patterns of alcohol consumption to more of hazardous use as the traditional control of alcohol by elders had waned in post-independence Ghana. Increased use of alcohol among women was also reported (Akyeampong, 1996). There has been an expansion of the alcohol

industry over time (Ferreira-borges et al., 2017) and a high proportion of drinkers consume both foreign and locally brewed alcoholic drinks.

Socio-cultural norms pertaining to the role of alcohol in the various communities mentioned by the participants include its use for rituals during naming ceremonies, funerals, and formed part of items for bride wealth payment. Participants revealing that alcohol was an indispensable part of bride wealth payment and its payment insisted upon whether one's religious beliefs permitted it or not, signified unchanging cultural norms in the face of social and economic transformation particularly among the Dagomba in Chanshegu. Smith (2001) and Akyeampong, (1996) affirm the role of alcohol in the African society. They indicate that, the gathering of members of the community for naming ceremonies, marriage, and funeral served to bind the community together as these ceremonies required economic support, participation and social organisation of the family, clan, and lineage.

Socio-cultural norms regarding the circumstances of alcohol use mentioned in the various communities were during social gatherings such as group meetings, birthday and other parties, during funerals, naming and marriage ceremonies. Some noted its use as aphrodisiacs to increase sexual potency, appetizers by new mothers after birth. Medicinal uses of alcohol specified included removal of phlegm, stress relief, curing piles and serving as a painkiller. Similarly, during the independence era, views of alcohol as an aphrodisiac and that strong drinks having high alcoholic content are remedies for parasites in the gastrointestinal tract existed (Adomakoh, 1976). Adomakoh (1976) explicates that unregulated use of alcohol accounts for the extensive ignorance of its dangerous effect and consequences. Lasebikan, Ayinde, and Odunleye (2018) as well as Lasebikan, Ayinde, Odunleye, et al. (2018) affirm this explanation proffered by Adomako (1976). Notably, variations existed between the communities in terms of the extent of alcohol use during community activities. For instance communities with high proportions of Muslims, described as a non-permissive group by Adomakoh (1976) did not use alcohol in many

community activities save traditional funeral and marriage rites compared to permissive groups or societies, which were made of traditionalists and Christians among whom alcohol served a vital role in community activities.

Concerning socio-cultural norms on availability of alcohol, variations existed among communities in terms of availability of types of alcoholic drinks. Communities such as Ga Mashie, Gyegyeano, and Tafo reported more diverse varieties of alcoholic beverages and vending points available compared to the other study communities. In consonance with this finding, open space drinking points which are widespread in the urban centres, have been affirmed as facilitating alcohol abuse as they openly display drinks, are easy to reach, make all types of alcohol easily available and have no operating licenses (Lasebikan, Ayinde, & Odunleye, 2018; Lasebikan, Ayinde, Odunleye, et al., 2018). Some groups of participants in this study confirmed that the increased prevalence of alcoholic beverages and vending points served as a source of temptation. These could serve as barriers to quitting alcohol consumption by persons with AUDs. Participants indicated various categories of use which include normal consumption, moderate, excessive drinking and harmful use of alcohol.

7.4.2.2 Causes of Alcohol Use and Abuse

Pertaining to the causes of alcohol consumption, emotional, individual choice, supernatural, stressful life events, tempting situations, poor mental health and social networks were outlined. A notable cause of alcohol consumption was poor mental health characterised by an individual “thinking too much”. This is in line with the self-medication hypothesis by Khantzian, (1997) which posits that in coping with emotionally distressing states which brought about stress, individuals used substances, including alcohol which created an illusion of relief. The study discussants mentioned emotional states such as happiness and sadness as leading to alcohol use and abuse. They further added that the sad emotional states come as a result of the chronic or acute stressful life situations of divorce, tragedy, poverty, and unemployment. They indicate the supernatural causes of evil spirits

and curses. A finding that alcohol was a tool used by the devil to "spoil" individuals from a qualitative study conducted in Ghana by Read et al. (2009) supports the finding of supernatural causation of alcohol abuse in this study. Asare (1999) also confirms that a person who excessively takes in alcohol is likely to be viewed as cursed. The influence of social networks in alcohol abuse was mentioned. Other themes of individual choice and tempting circumstance of ubiquity of alcohol in the communities particularly urban centres emerged from the discussions.

7.4.2.3 Outcomes of Alcohol Use and Abuse

Outcomes of consumption of alcohol included physiological changes, social deviance, morbidity and mortality. Mental illness as a consequence of alcohol consumption was commonly discussed in the various communities. Respondents attributed these adverse outcomes to the consumption of highly intoxicating beverages. Local names in the Ghanaian society for such beverages for example, the local gin 'akpeteshie' as *Kume prɛko* ('Kill me quick'), 'Apio', *Efie Nipa* ('destructive significant other'), and *Keley* ('hot drink'), depict its potent and hazardous nature. These local labels, for home brewed beverages capture various meanings constructed by the Ghanaian society. The cultural conception of alcohol reflects in the general perception of alcohol as not being beneficial by most study communities as it caused serious health challenges and led to death. Some participants shared that, excessive alcohol consumption could cause epilepsy. This perception may have been drawn from observing persons with AUDs presenting with seizures. Literature indicates that alcohol-related seizures may be caused by alcohol intolerance, withdrawal and hazardous consumption (Bråthen et al., 2011).

On the social deviance outcome of alcohol use and abuse, participants articulated the use of alcohol for confidence to settle scores and engage in unruly behaviour. For instance, in some Akan societies, *akpeteshie* is called *Ka bi kyerɛ w'ase* ('Speak your mind to your in-law') and *Anfɛre w'ase* ('you were not shy of your in-law'). This is because the

alcoholic beverage makes one bold enough to settle scores with persons of repute or power they would not on a normal day have engaged in a banter with.

7.4.2.4 Emergent Themes

Emergent themes of the co-use of alcohol and marijuana, cough syrups, tramadol, a prescription medication and rusty nails were noted in the findings. These items served to increase the psychoactive effects of the beverages by increasing fermentation as indicated by Asare (1999). Similarly, a qualitative study, which utilized participant observation method to observe roadside, and car park drinking bars in Nigeria noted the purchasing and combination of cannabis and prescription medication with alcohol (Lasebikan et al., 2018). The emergent theme of underage persons accessing and consuming alcohol and the use of rusty nails is also observed by Asare (1999) who revealed that, the practices of combining alcohol with other substances or items and underage persons accessing alcohol have existed since the 1970s and have had consequences on the Ghanaian society hence the need for practicable interventions to mitigate adverse outcomes.

In all, these qualitative findings validate the cross-sectional and panel results of this study, which similarly show stressful life situations such as food insecurity, marital status, employment status, tobacco use and chronic conditions as being linked to poor mental health. Further, mental health was mentioned as the outcome of alcohol use and alcohol use was indicated as being associated with mental health thus supporting a perception of bidirectional relationship between alcohol consumption and mental health among the study communities.

CHAPTER EIGHT

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

8.1 Introduction

Alcohol use and mental disorders have significantly contributed to morbidity and mortality globally over the past decades. They have not received much attention in many developing countries including SSA because of lack of data, particularly population-level longitudinal data to assess the trends, associations and community understandings of alcohol use and mental health. To be able to develop effective plans for interventions, such data are required. Existing global evidence have examined associations between alcohol use and mental health. However, studies examining gender differences in the cross-sectional association between alcohol use and mental health in developing contexts are limited. Further, population-level panel studies on the association between alcohol use and mental health among men and women in limited resource contexts have been infrequent. In addition, there have been inconsistent findings on the direction of the relationship in global literature. Qualitative evidence on socio-cultural understandings of mental health and alcohol consumption are also lacking. Research on community understandings of mental health as well as alcohol use is vital, in that, it depicts socio-cultural ideologies, beliefs, shared norms and practices pertaining to these phenomena, which may determine health-seeking behaviour, healthcare utilisation and hence have policy implications.

The overarching objective of this study was to examine the relationship between alcohol use and mental health among adults in Ghana. Specifically the study aimed at examining the levels and changes in alcohol use and mental health over time, assessing the cross-sectional relationship between alcohol use and mental health among men and women, investigating the longitudinal relationship between alcohol use and mental health among men and women, finding out the direction of the relationship between alcohol use and

mental health over time and exploring the community level views on alcohol use and mental health in Ghana. The epidemiologic transition theory, the biopsychosocial model of mental illness and Social Construction theory were used to holistically explain the relationship between alcohol use and mental health at the population and community levels. In essence, this study contributes to literature as it has provided stronger evidence by assessing the long-term influence of alcohol use on mental health and the temporal relationship between alcohol use and mental health at the population level. Further, socio-cultural perceptions of mental health and alcohol consumption have been explored hence providing a basis for interventions on alcohol use and mental health among adults in Ghana.

Informed by the pragmatic paradigm, the study utilised a parallel mixed methods design, comprising of quantitative and qualitative approaches to answer the research questions. The secondary quantitative data, WHO SAGE Waves 1 and 2 Ghana data were used to assess the prevalence and trends of alcohol use and mental health, cross-sectional and longitudinal associations between alcohol use and mental health among Ghanaian adults 23 years and above. Cross-sectional and panel descriptives comprising of frequencies, means and transition probabilities described trends and changes in the categorical, continuous and count variables. Non-parametric bivariate tests including Kruskal-Wallis H, Mann-Whitney *U* and Spearman Rank Order tests highlighted the mean ranks and associations between the categorical, count alcohol use independent, and control variables and the count depression dependent variable. Multivariate Zero-inflated Poisson regression models were used to examine the cross-sectional relationship between alcohol use status and depression of men and women in Waves 1 and 2. Multivariate random-effects Poisson panel regression models were used to first assess the panel associations between alcohol use status and depression and second used to assess the direction (whether unidirectional or bidirectional) of the relationship between counts of standard alcohol drinks and depression. The secondary qualitative data from the Social Representations of Stroke and Stroke Care

in Ghana Study (Sanuade, 2018) comprised of transcripts of 30 focus group discussions conducted among Ghanaian adults 20 years and above in four communities in the Central, Greater Accra, Volta, Ashanti and Northern Regions. These data were used to explore socio-cultural understandings of mental health and alcohol use. Qualitative data were analysed using thematic network analysis. The summary of findings, policy implications and recommendations for policy, future studies and practice are presented in the subsequent sections of this chapter.

8.2 Summary of Findings

8.2.1 Prevalence and Trends in Depression and Alcohol Use: Cross-sectional and Panel Descriptives

Over the 2 waves, there was an increase in depressive symptoms (a 39.5% increase for 2 to 7 symptoms, an 86.5% increase for 2 to 4 symptoms (MiDE) and a 15.3% increase for 5 to 7 symptoms (MDE)) in the total sample with women reporting more symptoms of depression compared to men. This finding of a high prevalence of depression in women has been corroborated in previous studies reviewed (Boughton & Street, 2007; DeRose, Wright, & Brooks-Gunn, 2006; Hankin & Abramson, 2001; Johnson & Whisman, 2013).

The cross-sectional descriptive statistics showed a decline in the proportion of lifetime abstainers (40.1% in Wave 1 to 35.4% in Wave 2), an increase in former drinkers (24.5% in Wave 1 to 28.0% in Wave 2), and decline in moderate (28.7% in Wave 1 to 19.0% in Wave 2), and heavy drinkers (4.7% in Wave 1 to 3.2% in Wave 2), among the total sample by Wave 2. Regarding gender-specific analysis, more women were abstainers and former drinkers while more men were moderate and heavy drinkers. In the total sample, the average count of standard alcoholic drinks consumed in the previous week were three standard drinks in Wave 1. Panel descriptives showed that though there was a decline in alcohol consumption among men and women, alcohol initiation, use (moderate or heavy use) and discontinuation (former use) was higher among the men than women between the two

waves. Cross-sectional and longitudinal studies reviewed have confirmed higher consumption of alcohol by men (Paschall et al., 2005; Rehm et al., 2009; Gea et al., 2013).

The bivariate results on the total sample and gender-disaggregated analysis showed no significant association between alcohol use (alcohol use status, counts of standard drinks of alcohol) and counts of symptoms of depression. This means that, alcohol use on its own may not significantly be linked to number of depressive symptoms among the sample studied and may require other factors to be controlled for in a multivariate analysis to predict mental health.

8.2.2 Cross-sectional and Panel Multivariate Associations between Alcohol Use and Mental Health

For the cross-sectional multivariate results, alcohol use status predicted mental health in Wave 1 but not in Wave 2. Male heavy drinkers were more likely to have higher counts of depressive symptoms compared to male lifetime abstainers in Wave 1 hence, the first hypothesis of this study was confirmed. Male moderate drinkers were more likely to have higher counts of depressive symptoms compared to male lifetime abstainers in Wave 1. Consequently, the second hypothesis of this study which stated that male moderate drinkers were more likely to have better mental health compared to male lifetime abstainers was disconfirmed. Among the control variables, significant protective and risk factors of depression differed for men and women and the waves hence showing the importance of conducting gender disaggregated and wave-disaggregated cross-sectional multivariate analysis.

Regarding the panel multivariate results, alcohol use status predicted counts of symptoms of depression over time. Similar to the cross-sectional multivariate results the first hypothesis of this study was confirmed as male heavy drinkers were more likely to have higher counts of depressive symptoms compared to male lifetime abstainers over time.

Again, male moderate drinkers were more likely to have higher counts of depressive symptoms compared to male lifetime abstainers in the long term hence, the second hypothesis of this study was rejected. That lifestyle factors (alcohol use) predict morbidity (depressive symptoms) with evolving economies affirming a process of transition in mental illness epidemiology over time.

The panel bidirectional analysis shows a unidirectional relationship, that is alcohol use (number of standard drinks) predicted mental health (counts of depressive symptoms) and not vice versa. This is in contrast with evidence which shows depression preceding alcohol use but not the reverse (Glantz et al., 2014; Subramaniam et al., 2017; Collins, Thompson, Sherry, Glowacka, & Stewart, 2018). These results again are inconsistent with reciprocal causal relationship theory which is the third hypothesis for this study. Of the control variables in the bidirectional model where alcohol was related to depression, risk factors of increased depressive symptoms included basic and secondary education, chronic disease medication use, being physically active, poor self-reported health, belonging to a household with good financial situation, social capital, belonging to a household with unpaid debt or loan and 2014 survey year. Protective factors included being currently married, ever having an accident- or violence-related injury, living in the rural area and belonging to the rich wealth quintile household.

Of the control variables in the bidirectional model where depression was regressed on alcohol use, risk factors of high counts of standard alcoholic drinks included being 50 years and above, having a basic or secondary level of education, belonging to the Traditional Religion, being currently employed, ever experiencing food insecurity in the year prior to the survey, currently using tobacco, currently using medication and being physically active. Protective factors against high counts of standard alcoholic drinks include being Christian, Muslim, having a high number of chronic conditions, ever having an accident- or violence-related injury, belonging to a household with unpaid debt or loan, living in the rural area

and belonging to the poor, middle and rich wealth quintile and the 2014 survey year. These predictors have been confirmed in various studies reviewed in Chapter 2 of this thesis. They further affirm the biopsychosocial model of mental illness and alcohol use, which posits that a complex interaction of biological, social and psychological factors predict mental illness and alcohol use rather than only biological factors.

8.2.3 Socio-Cultural Understandings of Alcohol Use and Mental Health

In sharing their perspectives on mental health, participants characterised mental health by defining mental health, classifying mental illness into types by their symptoms, and describing behaviour associated with the types of mental illness. Influenced by the Social Construction theory, understandings of mental health explored in the Ghanaian socio-cultural context showed that social and cultural meanings attached to mental illness by the various communities did not adhere solely to the biomedical notion of disease causation where mental illness is only caused by biological factors. They rather expressed the notion of dual causation, biological- where they believed that mental illness could be passed on through the family line (hereditary) and brought about by chronic conditions as well and supernatural- passed on to others by evil spirits, curses and witchcraft. They noted sociodemographic and economic factors such as stressful life events of food insecurity, financial problems, divorce and unemployment and psychoactive substances, alcohol and tobacco as leading to poor mental health. The notion of dual causation has been noted in various narratives from SSA (Read et al., 2009; Ventevogel et al., 2013; Arias et al., 2016; Osafo, 2016; Opare-Henaku & Utsey, 2017; Kpobi & Swartz, 2018). In coping with mental illness, the groups mentioned strategies such as spiritual, substance use and reliance on social networks. Finally, they indicated some expected consequences of poor mental health to include alcohol use and abuse, chronic diseases and death.

Pertaining to perceptions of alcohol use, the focus groups deliberated on the sociocultural context of alcohol use in the various communities, the causes and outcomes of

alcohol consumption. Participants identified various sociocultural norms pertaining to acceptability, community role of alcohol, circumstance of alcohol consumption, availability of alcohol and drinking patterns. With respect to the Social Construction theory, participants held the notion of dual causation of alcohol use and abuse, as they indicated both biological and supernatural causation. They specified emotional causes, individual factors, social networks, tempting situations, poor mental health, stressful life events and supernatural factors as causes of alcohol consumption. In relation to outcomes of alcohol consumption, participants indicated morbid conditions including poor mental health and death as results of alcohol consumption.

Participants held the notion of the bidirectional causation between alcohol use and mental health contrasting the quantitative results which showed a unidirectional relationship. In addition, the qualitative findings validate the cross-sectional and panel results of this study which similarly show stressful life situations such as food insecurity, marital status, employment status, tobacco use and chronic conditions as being linked to poor mental health. Therefore, both qualitative and quantitative findings affirm the biopsychosocial model that indicates that biological, psychological and social factors interact in a complex way to predict mental health.

8.3 Implications of Study

Findings from this study may have implications for theory, research, policy and practice. Alcohol use was related to depression over time. The results affirm a process of transition in mental illness epidemiology over time showing increased prevalence of morbidity (depression) at the population level and how lifestyle factors specifically alcohol use increased symptoms of depression among the sample with changes in population level socio-economic characteristics. Contrary to Omran's (1998) theory which stipulates an increasing intake of substances including alcohol leading to depression, this study's finding rather, showed a decline in prevalence of alcohol use predicting depression. To explain this,

panel descriptive statistics (transition probabilities) showed former users as the highest proportion of ever users of alcohol compared to moderate and heavy users. Therefore, the decline in prevalence of alcohol use predicting depression may be a result of the already occurred effects of heavy or moderate alcohol use (chronic diseases and organ damage) which may be irreversible hence the individual may have had to stop alcohol consumption. But then, the effects of previous heavy or moderate drinking manifesting in increased depressive symptoms exist over time because of these acquired chronic conditions. The theoretical implication of this finding is that though the theory applies to the trends in alcohol use and depression among Ghanaian adults, the driver of the increased depression trends is not current alcohol use but former use.

The biopsychosocial model of health and disease theory explained findings of this study as biological, social and psychological factors predicted mental health both cross-sectionally and longitudinally. The implication for practice is focusing on time consistent biopsychosocial factors associated with depression, which cut across space and time.

The Social Construction of mental illness and alcohol use and abuse by participants in the various communities were based on the notion of dual causation where they believed that mental illness could be biologically and supernaturally caused. That is, it could be passed on through the family line (hereditary) and brought about by chronic conditions as well and passed on to others by evil spirits, curses and witchcraft. Social interactions through illness labelling and stigma determined how mentally ill persons experienced mental illness in the communities. Social interactions also determined levels of alcohol consumption in the various communities. Theoretically, this study's findings imply a complex view of mental illness and alcohol use causation by the Ghanaian society.

8.4 Conclusions

The study provides a bigger picture of the phenomena of alcohol consumption and mental health among adults in Ghana by examining the relationship across space and time and among individuals and within groups. Specifically, an in-depth understanding of the relationship is gained by using both quantitative data to assess the cross-sectional and longitudinal relationship between alcohol use and mental health and qualitative data to provide an in-depth understanding of the socio-cultural construction of mental health and alcohol consumption in the various study communities in Ghana. This study showed an increase in counts of symptoms of depression over time particularly among women. Further, a higher proportion of men initiated alcohol use, were moderate and heavy drinkers and discontinued within the two waves compared to women. Alcohol consumption was associated with depressive symptoms over time in that men who were former, moderate, and heavy drinkers were more likely to have higher counts of symptoms of depression compared to abstainers both cross-sectionally and longitudinally while female heavy drinkers were more likely to have high number of symptoms of depression cross-sectionally. Various demographic, social, economic and health-related factors were protective against, or were risk factors for counts of symptoms of depression. These show that predictors of depression are complex and multidimensional as indicated by the biopsychosocial model of mental illness. Further, the qualitative findings have shown that sociocultural meanings of alcohol and mental illness are socially constructed and these social constructions determine illness experience and behaviour, particularly health-seeking behaviour. In all, these findings provide crucial evidence to inform policy formulation, implementation and interventions.

8.5 Recommendations

8.5.1 Policy Recommendations

Presently, the Ghana Mental Health Authority together with the UK Department for International Development (DFID) and a team of consultants are preparing a 10-year mental health policy document as a framework to implement the objectives indicated in the Mental Health Act 2012 (Act 846) (MHA, 2018). Therefore, evidence from this study is timely as it would contribute to policy specificity in the policy development process. First, trend results showed that number of symptoms of depression in the total sample particularly among women increased over time. Second, the findings of unidirectional causation, that is alcohol predicts depression over time with moderate and former alcohol use not being protective against depression suggests that specific measures should be taken to reduce depressive symptoms and alcohol use.

On reducing depressive symptoms, this study recommends that the MHA in addition to providing treatment and rehabilitation services for persons with substance use disorder at the sub-district, district, regional and national levels, screening services for symptoms of depression among persons with substance use disorders should also be provided, as there may be co-morbidity with depression.

Alcohol use was significantly associated with mental health cross-sectionally and longitudinally. Specifically, male former, moderate and heavy drinkers were more likely to have higher counts of depressive symptoms. Female heavy drinkers reported higher counts of depressive symptoms cross-sectionally. These indicate the importance of also considering alcohol use for mental health policy measures. According to an OECD study in 2015, alcohol's detrimental effects outweighed its benefits in all countries studied. Further, from the qualitative study, many participants based on social interactions and observations of harmful drinking patterns in the various communities considered alcohol consumption as

not beneficial because it caused abnormal behaviour and several health challenges. In addition, from this study, moderate drinking increased counts of depressive symptoms. Also, former users may have been moderate or heavy drinkers in the past but had to stop drinking prior to and during the surveys because they had had a chronic condition(s) therefore increasing their number of depressive symptoms. Subsequently, in consonance with the objective of the National Alcohol Policy, which seeks to minimize health complications and outcomes of harmful alcohol consumption (MOH, 2016), there should be the promotion of healthy lifestyle aimed at alcohol abstinence for abstinent persons and or reducing alcohol intake for moderate and heavy drinkers. Former users with comorbidities should be encouraged to engage in healthy lifestyles. At the micro level, taking a life course approach, this study recommends an implementation of education on alcohol use for pregnant women, mothers and men. Various settings as preschools, schools, workplaces, markets, bus stations and hospitals where children, adolescents, youth, adults and the elderly should also be targeted. Information and education on abstinence and reducing alcohol intake should be gender-specific based on findings in this study of gender differentials in alcohol use effect. Further, gender-specific education has been shown in other studies to yield substantial benefits (Ogenchuk et al., 2013).

Notably, the national definition of quantity of grams in alcohol contained in a standard alcoholic drink in the Dietary and Physical Activity Guideline for Ghana is adapted from the 2005 Dietary Guidelines for Americans hence does not consider locally produced and home-brewed alcohol (MOH, 2010). In addition, the dietary guideline and the recent national alcohol policy does not have national guidelines on minimum and maximum thresholds for moderate and excessive alcohol consumption among men and women. This study recommends that MOH should formulate drinking guidelines generated from evidence from the Ghanaian context. This would help better evaluate drinking patterns and regulate alcohol consumption as is being done in other contexts.

At the macro level, some policies to regulate alcohol advertisement stipulated by the National Alcohol Policy and FDA's Guidelines for the Advertisement of foods have been implemented. For instance banning advertisements that portray alcoholic beverages as increasing sexual performance, success, sports, pleasure, appetite and solving one's physical and social problems. In 2018, the FDA of Ghana banned alcohol advertisements and live mention of alcoholic beverages by presenters in the media before 8:00pm (Doku, 2018). In January 2020, Ghanaian celebrities and popular individuals were banned from featuring in alcoholic beverage advertisements ("Legal Issues Involved in FDA Ban on Celebrities Featuring in Alcohol Adverts," 2020). In addition to these measures, there should be comprehensive restrictions on individuals' exposure to advertisements on alcohol hence the ban must include billboard and social media adverts.

In the qualitative aspect of this study, participants mentioned that the proliferation of tabletop vending points and beer bars and influx of a variety of alcoholic beverages served as a source of temptation. This observation has been confirmed by OECD (2015) in their review of research by neuroscientists who reveal that heavy drinkers were less likely to limit or stop alcohol consumption without outside influence compared to moderate drinkers. Further, their cravings for alcohol was higher compared to moderate drinkers and so were more responsive to alcohol cues from alcohol advertisements and openly displayed alcoholic drinks than moderate drinkers. Other studies have also shown a high prevalence of alcohol use disorders among persons patronizing outdoor alcohol vending points (Lasebikan, Ayinde, & Odunleye, 2018; Lasebikan, Ayinde, Odunleye, et al., 2018). In view of these, this study recommends that the Ghana National Alcohol Commission (GNAC), the Local Alcohol Task Force (LAT) and law enforcement agencies should enact and enforce restrictions on physical availability and accessibility to alcohol at the community and national levels. Restrictions could be on the place of sale, time of sale and on licensing for the sale and distribution of alcohol to reduce the reduce density of alcohol retail outlets in

various localities. Again, this study showed reports of children being sent to buy drinks for adults, and purchasing some to drink under the pretense of being sent by adults. This study recommends that law enforcement agencies should enforce the appropriate minimum age for selling, purchasing or consumption of alcohol to curb the practice. Living with chronic conditions and having worse self-reported health increased persons' risk of counts of depressive symptoms over time. Prevention strategies such as promotion of healthy lifestyles with regard to increasing intake of fruits and vegetables, engaging in moderate physical activity and avoiding tobacco use must be adopted by health promotion agencies under GHS.

The qualitative findings showed that participants held dual causation of mental illness and alcohol use notions, that is the normal (biological) and abnormal (supernatural) causes. This notion informed community members' coping strategies and health seeking behaviour. In addition, consistently in the cross-sectional and panel results, participants who received treatment for accident- or violence-related injuries and individuals using medication for any chronic disease were more likely to report higher number of depressive symptoms. It may be an issue of medication non-compliance. Some studies conducted in Ghana revealed that medication non-compliance was because of the belief that orthodox medicine was ineffective for spiritually caused ailments. There was also co-use of orthodox and herbal medication and or spiritual healing from churches, traditional healers and mallams among persons with chronic diseases including mental disorders and alcohol use disorders (Ae-ngibise et al., 2010; Arias et al., 2016; Osafo, 2016; Atinga et al., 2018; Kpobi & Swartz, 2018; Semahegn et al., 2018; Kpobi & Swartz, 2018). Based on these, and as indicated in the Mental Health Act, 2012, Act 846 and Osafo (2016), the MHA should collaborate with the traditional and alternative medicine council and other unorthodox healthcare providers through task shifting or sharing to meet the needs of persons with mental or AUDs.

8.5.2 Recommendations for Future Research

As findings showed that increased counts of standard drinks increased symptoms of depression, for future research, this study recommends the examination of longitudinal associations between co-use of alcohol and tobacco on mental health to inform interventions on mental health. In addition, the moderating role of chronic disease in the relationship between alcohol use and mental health should be explored. This is because, the simultaneous effect of alcohol consumption and co-morbidity status on depression may be greater. Further studies should consider more waves in assessing the relationship between alcohol use and mental health perhaps a bidirectional relationship, as shown in other studies may emerge with additional waves considered. It would also aid to better understand the dynamic relationship across a longer length of time. For qualitative studies, this study recommends in-depth individual interviews on life histories of alcohol users with symptoms of depression to further explain why former and moderate alcohol use increased depressive symptoms.

8.5.3 Recommendations for Practice

With reference to Engel (1977, 2012) and as shown by this study's findings of a multiplicity of biological, psychological and social factors determining mental health, this study recommends that the biopsychosocial approach to care for patients with mental disorders, including depression should be strengthened. This model allows mental health professionals using demographic, socioeconomic and chronic condition information to holistically understand the social (cultural), psychological and behavioural dimensions of mental ill health so as not to miss clients suffering from poor mental health as a result of biological, psychological and social factors.

This study found a unidirectional relationship between alcohol use and depression, therefore, I recommend that to optimize care, mental health practitioners including psychologists and psychiatrists at all healthcare levels should screen for depression among persons with AUDs. In addition, both abstinence-focused and harm reduction

psychotherapy interventions should be utilized by psychiatrists to treat alcohol use. This is to help frequent alcohol users who are unable and unwilling to undergo the abstinence-based therapy approach because they may not have abstinence goals to receive personalised treatment in the form of harm reduction.

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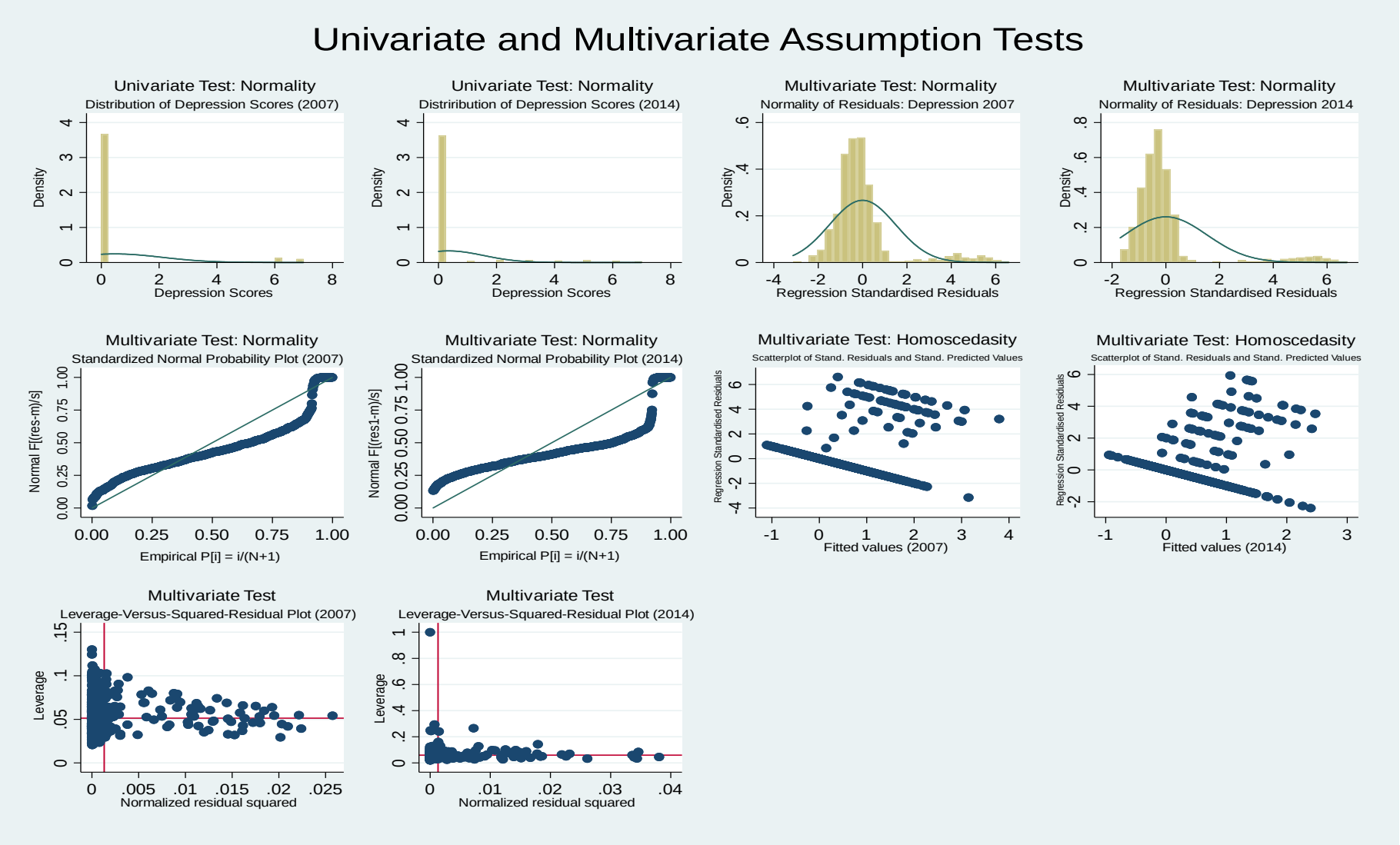
APPENDICES

APPENDIX A: Univariate and Multivariate Linear Regression Assumption Tests (Graphs)

Figure A1: Univariate and Multivariate Linear Regression Assumption Tests (Graphs)



APPENDIX B

Univariate and Multivariate Linear Regression Assumption Tests (Tables)

Table B1.Univariate Normality Tests of Depression Scores (Wave 1 and 2)

Variable	Mean (SD)	skewness	kurtosis	Pr(Skewness)	Pr(Kurtosis)
Depression Score (2007)	0.42 (1.53)	3.435593	13.12263	0.000	0.000
Depression Score (2014)	0.35 (1.27)	3.708004	15.97977	0.000	0.000

Table B2. Multivariate Normality Test - Skewness and Kurtosis of Residuals (Wave 1 and 2)

	Mean (SD)	skewness	kurtosis	Pr(Skewness)	Pr(Kurtosis)
Residuals (2007)	-2.35 (1.50)	2.754391	10.63534	0.000	0.000
Residuals (2014)	4.41 (1.53)	2.884845	12.22299	0.000	0.000

Table B3. Multivariate Normality Test (Shapiro-Wilk Test for Normality of errors)

	W	V	z	Prob>z
Residuals 2007	0.63583	332.165	14.609	0.000
Residuals 2014	0.65503	314.652	14.473	0.000

Note. Significant tests (p<0.001) represents a non-normal distribution of residuals. The null hypothesis states that count of symptoms of depression is distributed normally versus count of symptoms of depression is not distributed normally. Sig tests show a non-normal distribution as P<0.001

Wave 1 Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance

Variables: fitted values of Depression (2007)

chi2(1) = 902.25

Prob > chi2 = 0.0000

Wave 2 Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance

Variables: fitted values of Depression (2014)

chi2(1) = 1221.18

Prob > chi2 = 0.0000

APPENDIX C

Univariate and Multivariate Count Models Assumption Tests

Table C1. Assessing the Distribution of Depressive Symptoms for the Poisson model (Univariate)

Depression	Mean	SD	Variance
Wave 1	.4743429	1.629622	2.6556692
Wave 2	.3454318	1.204971	1.4519559

Table C2.Goodness of Fit statistics for Count Models and Selection Criteria (Multivariate Tests)

Model Fitted	Log likelihood (model)	AIC	BIC	Model Significance	Reason for Non-selection of model
Poisson 2007	-1394.273	2844.546	2993.298	Significant	Poor fit due to huge AIC and BIC
Poisson 2014	-1200.804	2459.608	2613.672	Significant	Poor fit due to huge AIC and BIC
NB 2007	-700.893	1459.786	1613.85	significant	Significant model
NB 2014	-717.638	1495.275	1654.652	Significant	Significant model but larger AIC and BIC than ZIP 2014
ZIP 2007	**-570.103**	**1200.207**	**1359.583**	**Significant**	**Selected***
ZIP 2014	**-678.106**	**1418.214**	**1582.903**	**Significant**	**Selected***
ZINB 2007	-570.103	1202.207	1366.896	Not significant	Not significant model (p=9520)
ZINB 2014	-678.1068	1420.214	1590.215	Significant	Significant but with huge exponent coefficient values

Note. Negative Binomial Regression; ZIP: Zero-inflated Poisson Regression; ZINB: Zero-inflated Negative Binomial; AIC: Akaike's Information Criterion; BIC: Bayesian Information Criterion

A larger AIC & BIC statistic indicates over dispersion.

*****Best fitting model selected for each Wave

APPENDIX C1

Multivariate Count Model Tests

Table C3: Tests and Measures of Fit of Count Models (Wave 1)

PRM		BIC= 3525.109	AIC=3351.288	**Prefer**	**Over**	**Evidence**
Vs	**NBRM**	BIC= 1925.764	dif=1599.345	NBRM	PRM	Very strong
		AIC= 1746.511	dif=1604.777	NBRM	PRM	
		LRX2= 1606.777	prob=0.000	NBRM	PRM	p=0.000
vs	**ZIP**	BIC= 1632.598	diff=1892.510	ZIP	PRM	Very strong
		AIC= 1447.914	dif=1903.374	ZIP	PRM	
		+Vuong= .	prob=.	ZIP	PRM	p=.
vs	**ZINB**	BIC= 1640.030	dif=1885.079	ZINB	PRM	Very strong
NBRM		BIC= 1925.764	AIC=1746.511	**Prefer**	**Over**	**Evidence**
vs	**ZIP**	BIC= 1632.598	dif=293.165	ZIP	NBRM	Very strong
		AIC= 1447.914	dif=298.597	ZIP	NBRM	
vs	**ZINB**	BIC= 1640.030	dif=285.733	ZINB	NBRM	Very strong
		AIC= 1449.914	dif=296.597	ZINB	NBRM	
		+Vuong= .	prob=.	ZINB	NBRM	p=.
ZIP		BIC= 1632.598	AIC=1447.914	**Prefer**	**Over**	**Evidence**
vs	**ZINB**	BIC= 1640.030	dif=-7.432	ZIP	ZINB	Strong
		AIC= 1449.914	dif=-2.000	ZIP	ZINB	
		LRX2= 0.000	prob=0.500	ZINB	ZIP	p=0.000

[+]Vuong Tests are not recommended for testing zero inflation for non-nested models (Wilson, 2015)

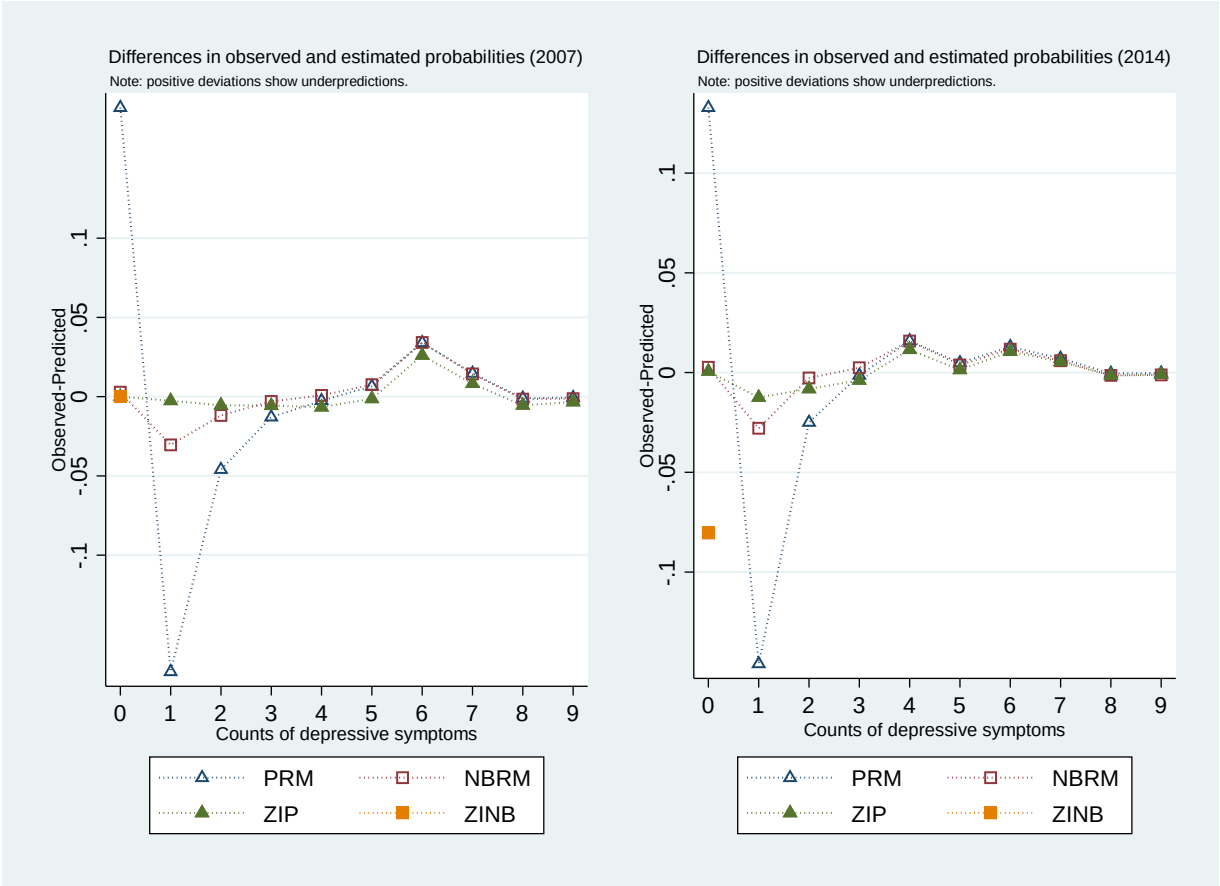
Table C4: Tests and Measures of Fit of Count Models (Wave 2)

PRM		BIC= 2184.777	AIC=2019.137	**Prefer**	**Over**	**Evidence**
vs	**NBRM**	BIC= 1411.611	dif=773.166	NBRM	PRM	Very strong
		AIC= 1240.794	dif=778.342	NBRM	PRM	
		LRX2= 780.342	prob=0.000	NBRM	PRM	p=0.000
vs	**ZIP**	BIC= 1350.131	dif=834.645	ZIP	PRM	Very strong
		AIC= 1174.139	dif=844.998	ZIP	PRM	
		+Vuong= .	.	ZIP	PRM	p=.
vs	**ZINB**	BIC= 1357.308	dif=827.469	ZINB	PRM	Very strong
		AIC= 1176.139	dif=842.998	ZINB	PRM	
NBRM		BIC= 1411.611	AIC=1240.794	**Prefer**	**Over**	**Evidence**
vs	**ZIP**	BIC= 1350.131	dif=61.479	ZIP	NBRM	Very strong
		AIC= 1174.139	dif=66.655	ZIP	NBRM	
vs	**ZINB**	BIC= 1357.308	dif=54.303	**ZINB**	**NBRM**	**Very strong**
		AIC= 1176.139	dif=64.655	ZINB	NBRM	
		+Vuong= .	.	ZINB	NBRM	p=.
ZIP		BIC= 1350.131	AIC=1174.139	**Prefer**	**Over**	**Evidence**
vs	**ZINB**	BIC= 1357.308	dif=-7.176	ZIP	ZINB	Strong
		AIC= 1176.139	dif=-2.000	ZIP	ZINB	
		LRX2= 0.000	prob=0.500	ZINB	ZIP	p=0.000

[+]Vuong Tests are not recommended for testing zero inflation for non-nested models (Wilson, 2015)

APPENDIX C2

Graph C1. A Graph Comparing Observed and Predicted Probabilities of count models (Wave 1 and 2)



APPENDIX D

Table D1 Kruskal-Wallis H, Mann-Whitney *U* and Spearman Rank Order Table of Distribution of Counts of Depression Symptoms across Sociodemographic Characteristics of the Total Sample

Variable	Wave 1			Wave 2		
	Total Sample (N=1499)			Total Sample (N=1499)		
	Ranked Mean	$^{a}Z/\ \chi^2\ /r_s$	$^{b}\eta^2$	$^{b}\eta^2$	Ranked Mean	$^{a}Z/\ \chi^2\ /r_s$	$^{b}\eta^2$
Age Groups		-2.21*	0.004			-0.39	0.000
Less than 50 years	717.2				740.9		
50+ years	753.8				750.5		
Sex		-2.40*	0.003			-2.56*	0.005
Male	738.2				736.4		
Female	762.6				764.5		
Marital Status		-2.49*	0.004			-3.94***	0.009
Not currently Married	765.7				772.7		
Currently Married	739.8				729.3		
Place of Residence		-1.19	0.001			-1.14	0.001
Rural	754.8				755.1		
Urban	742.5				742.2		
Currently working		-1.99*	0.003			-5.13***	0.015
No	770.8				786.7		
Yes	745.1				728.1		
Religion		6.21	0.005			21.92***	0.021
None	763.8				861.6		
Christian	744.4				746.9		
Islam	750.2				728.5		
Traditional Religion	790.2				790.8		
Level of Education		6.22*	0.004			2.12	0.002
None	762.7				757.5		
Primary	742.3				737.9		
Secondary/higher	734.5				747.2		
Wealth Quintile		9.86*	0.006			3.42	0.002
Poorest	741.8				750.0		
Poor	741.1				764.8		
Middle	772.9				753.0		
Wealthy	760.8				737.1		
Wealthiest	729.9				747.5		
Region of residence		38.47***	0.028			31.90***	0.030
Ashanti	727.3				776.5		
Brong Ahafo	751.7				718.8		
Central Region	764.3				724.3		
Eastern region	787.6				729.5		
Greater Accra Region	727.5				744.6		
Northern Region	790.5				715.8		
Upper West	694.5				760.6		
Upper East	694.5				765.1		
Volta Region	713.0				816.2		
Western Region	784.9				747.9		

APPENDIX D1

Table D2 Kruskal-Wallis H, Mann-Whitney U and Spearman Rank Order Table of Distribution of Counts of Depression Symptoms across Community and Household Factors of the Total Sample

Variable	Wave 1			Wave 2		
	Total Sample			Total Sample		
	Ranked Mean	$^{a}Z/\ \chi^2\ /r_s$	$^{b}\eta^2$	$^{b}\eta^2$	Ranked Mean	$^{a}Z/\ \chi^2\ /r_s$	$^{b}\eta^2$
HH Financial Situation		-2.72**	0.005			-1.56	0.005
Bad	760.0				759.9		
Good	730.8				742.5		
HH Debt		-3.18**	0.006			-0.35	0.001
No	741.2				749.4		
Yes	779.7				756.7		
Food Insecurity		-0.82	0.000			-3.15**	0.015
Never	747.4				741.9		
Ever	756.6				787.3		
Social Capital	-	0.11***	0.015		-	-0.10***	0.004
Lifestyle Factors							
Tobacco use		-1.47	0.002			-0.75	0.000
No	745.9				752.5		
Yes	763.5				743.2		
Physical Activity		-1.00	0.001				
Inactive	736.6				763.1	-1.74	0.001
Active	751.9				742.9		
Diet		-4.20***	0.012			-0.81	0.000
Unhealthy	764.0				745.8		
Healthy	717.5				754.9		
Physical Health							
Chronic Condition(s)	-	0.22***	0.057		-	0.06*	0.004
Medication use		-7.56***	0.041			-1.29	0.001
No	731.0				748.9		
Yes	827.5				797.5		
Injury		-1.29	0.001			-0.68	0.001
No	751.9				750.6		
Yes	727.0				740.6		
Self-Reported Health	-	0.17***	0.031		-	0.27***	0.101
Previous week alcohol consumption	-	-0.19	0.002		-	-0.02	0.000

APPENDIX E

Table E1. Frequency Table of Themes (Global, Organizing and Basic) on Community Perceptions of Mental Health

	Community					
Theme	**Agorve**	**Gyegyeano**	**Ga Mashie**	**Tafo**	**Chanshegu**	**Total**
Characterisation of Mental Health and Illness						
1. Definition of mental health and illness						
Psychologically healthy	0	1	0	0	0	1
Psychologically unhealthy	0	1	0	0	0	1
Disease of the mind	0	1	2	0	0	3
2. Description of Mental illness Behaviour						
Acts strangely	0	0	2	0	0	2
Cannot Speak	0	0	1	0	0	1
Eats filthy things	0	1	0	0	0	1
Forgets things easily	0	0	1	0	0	1
Incomprehensible	0	0	2	0	0	2
Views filthy things as clean	0	1	0	0	0	1
Looks normal from afar	1	0	0	0	0	1
3. Symptoms of Poor Mental Health						
Worry too much	0	3	1	0	0	4
Insomnia	0	1	0	0	1	2
No peace of mind	0	0	0	0	2	2
4. Classification of mental conditions						
Severe	0	2	0	0	2	4
Not severe	0	0	1	0	0	1
Causes of Poor Mental Health						
1. Biological						
Genetic	0	0	0	1	0	1
2. Stressful Life Events Deprivation						
Food Insecurity	0	0	0	0	1	1
Unemployment	0	0	0	2	0	2
Union disruptions						
Divorce	0	0	1	0	0	1
Family responsibilities	0	0	0	1	0	1
Financial problems	0	1	0	1	0	2
Chronic conditions						
Stroke	2	3	2	6	1	14
Other life challenges	0	0	1	1	0	2
3. Supernatural causes	0	1	0	3	0	4
4. Substance abuse						
Alcohol abuse	0	0	0	1	0	1

APPENDIX E1

Table E1. Frequency Table of Themes (Global, Organizing and Basic) on Community Perceptions of Mental Health (continued)

	Community					
Theme	**Agorve**	**Gyegyeano**	**Ga Mashie**	**Tafo**	**Chanshegu**	**Total**
Expected Consequences						
1. Substance use						
Alcohol abuse	0	0	1	0	0	1
2. Chronic Diseases						
Hypertension	0	4	0	1	1	6
Stroke	0	0	0	2	0	2
Other chronic diseases	0	1	0	3	0	4
3. Poor mental health						
lack of peace of mind	0	0	0	0	2	2
4. Death						
Suicide-related death	0	0	2	0	0	2
Non suicide-related death	0	0	2	1	0	3
Coping Strategies						
1. Psychotherapy						
Psychiatrist	0	1	0	0	0	1
2. Religion						
Prayer	0	1	0	0	0	1
3. Substance abuse						
Smoking	0	0	0	0	2	2
4. Social networks						
Significant others	0	1	0	0	0	1

APPENDIX E2

Table E2. Frequency Table of Themes (Global, Organizing and Basic) on Community Perceptions of Alcohol Use (continued)

Theme	Community					Total
	Agorve	Gyegyeano	Ga Mashie	Tafo	Chanshegu	
Socio-cultural context of alcohol use						
1. Socio-cultural norms						
i. Acceptability of alcohol consumption						
Negative attitudes	2	5	2	1	7	17
Positive attitudes	2	1	3	2	5	13
ii. Alcoholic drinks available						
Bitters						
Adonko	1	5	6	7	0	19
Agya Appiah	0	1	0	2	0	3
Kasapreko Alomo	0	1	3	1	0	5
Biegya	0	0	0	2	0	2
Capital one	0	0	1	0	0	1
Choice	0	0	1	0	0	1
Famekor	0	0	1	0	0	1
Fighter	1	0	0	0	0	1
Herb afrik bitters	0	0	1	0	0	1
Joydadi	0	0	0	2	0	2
Kakai	1	4	1	1	0	7
Kamame	0	2	1	0	0	3
Kiss	0	0	0	1	0	1
Rosoroso	0	0	1	0	0	1
Twabi mame	0	0	1	0	0	1
Twedie ginger	0	1	2	1	0	4
Atemuda	0	0	0	3	0	3
Nana Takyi bitters	0	1	0	0	0	1
Happy man bitters	0	1	0	0	0	1
Palm sap wine						
Palm wine	1	0	0	1	0	2
Spirits						
Castle bridge dry gin	0	0	1	0	0	1
Sachet drinks	1	0	2	0	0	3
Akpeteshie	1	3	6	5	2	17
Beer						
Club beer	0	1	1	2	1	5
Guinness	0	2	0	1	0	3
Pito	0	0	0	0	4	4
iii. Mostly consumed alcoholic beverages						
Adonko bitters	1	0	0	1	0	2
Akpeteshie	6	2	0	1	8	17
Kasapreko Alomo	0	0	0	1	0	1
Club beer	0	0	0	0	2	2
Guinness	0	0	0	1	0	1
Pito	0	0	0	0	4	4
Biegya	0	0	0	1	0	1
Sachet alcoholic drinks	2	0	0	0	2	4

APPENDIX E3

Table E2. Frequency Table of Themes (Global, Organizing and Basic) on Community Perceptions of Alcohol Use (continued).

Theme	Community					Total
	Agorve	Gyegyeano	Ga Mashie	Tafo	Chanshegu	
Socio-cultural context of alcohol use						
1. Socio-cultural norms						
iv. Format of Use						
Group consumption	1	1	0	0	0	2
Individual purchases	0	0	2	0	1	3
Solitary consumption	1	2	1	0	2	6
v. Pattern of use						
Hazardous use	1	3	4	2	1	11
Moderate use	0	0	1	0	1	2
vi. Socioeconomic status and alcoholic drink preference						
The rich						
Adonko	1	0	1	0	0	2
Club beer	2	1	1	1	0	5
Foreign drinks	0	1	0	0	0	1
Guinness	1	3	0	1	0	5
Hennessey Cognac	0	0	1	0	0	1
Hunters gin	0	0	1	0	0	1
Jack Daniels Whisky	0	0	2	0	0	2
Orijin	0	1	0	0	0	1
Savannah	0	0	1	0	0	1
Smirnoff	0	1	0	0	0	1
Star Beer	0	0	0	1	0	1
Whisky	0	0	1	0	0	1
The poor						
Akpeteshie	2	3	2	1	0	8
Adonko	1	0	1	0	0	2
Sachet drinks	0	1	0	0	0	1
2. Social change in communities in relation to alcohol use						
Increasingly permissive culture and government policies	0	0	1	1	0	2
Advent of religion which restricts alcohol consumption	0	0	0	0	1	1
3. Circumstance of alcohol use						
i. Rites of passage						
Naming ceremonies	0	2	5	0	0	7
Marriage rites	0	2	1	2	0	5
Funerals	2	5	8	2	9	26

APPENDIX E4

Table E2. Frequency Table of Themes (Global, Organizing and Basic) on Community Perceptions of Alcohol Use (continued)

Theme	Community					Total
	Agorve	Gyegyeano	Ga Mashie	Tafo	Chanshegu	
Socio-cultural context of alcohol use						
1. Socio-cultural norms						
ii. Other traditional rites						
Enskinment	0	0	0	0	2	2
Warriors	0	0	0	0	2	2
iii. Religious festivities						
Christmas	0	0	0	2	0	2
Easter	0	0	0	1	0	1
Festivals	3	3	0	0	1	7
iv. Other celebrations						
Birthday Parties	0	1	2	1	0	4
Other Parties	0	4	4	0	0	8
Valentine's day	0	0	0	1	0	1
v. Political/Social club activities						
Group meetings/Social clubs	0	2	0	1	0	3
Keep fit Clubs	0	1	1	0	0	2
Political campaigns	0	2	0	2	0	4
During weekends	0	0	1	2	0	3
vi. Medicinal purposes						
Heal stomach problems	2	0	0	0	0	2
Cure measles	0	0	1	0	0	1
Pain killer	1	2	0	0	0	3
Prevent hernia	2	0	0	0	0	2
Relieve stress	0	1	0	0	0	1
Remove phlegm	0	1	0	0	0	1
Heal piles	1	0	1	0	0	2
To strengthen the intestine	0	1	0	0	0	1
vii. To alleviate the pain of bereavement	0	1	0	1	0	2
viii.To enhance sexual performance (Aphrodisiac)	0	0	1	0	0	1
ix. For warmth during cold weather	1	0	0	0	0	1
x. Appetizer	3	3	5	2	0	13
xi. Occupational use (during fishing and farming)	2	0	0	0	0	2
xii. For confidence to settle scores	2	2	1	2	1	8

APPENDIX E5

Table E2. Frequency Table of Themes (Global, Organizing and Basic) on Community Perceptions of Alcohol Use (Continued)

	Community					
Theme	**Agorve**	**Gyegyeano**	**Ga Mashie**	**Tafo**	**Chanshegu**	**Total**
Socio-cultural context of alcohol use						
5. Community role of alcohol	2	0	0	0	0	2
Traditional rites						
Festivals	1	1	0	0	0	2
Funeral	2	0	0	0	2	4
Marriage rites	2	0	0	1	0	3
Naming ceremonies	0	0	0	1	0	1
Traditional prayers libation	0	0	0	0	2	2
Conflict resolution	0	3	0	0	0	3
Socialization	2	1	0	0	1	4
Payment of fines	1	0	0	0	0	1
6. Other prevalent norms						
Television adverts	0	3	1	0	0	4
Beer bars	0	0	2	0	2	4
Outdoor table top vending	0	0	1	0	0	1
Alcohol Use Causes						
1. Biological						
Genetic	0	2	0	0	0	2
2. Stressful life events						
Poverty	0	0	2	3	0	5
Unemployment	0	0	0	3	0	3
Divorce	1	0	2	2	0	5
Heartbreak	1	2	2	0	0	5
Family tragedy	1	0	0	0	0	1
Thinking	3	0	4	0	0	7
Troubling issue	2	0	1	1	0	4
3. Emotional causes						
happiness/sadness	1	2	6	9	0	18
4. Television adverts	0	0	0	1	0	1
5. Social networks						
Peer influence	2	3	4	1	1	11
6. Supernatural forces	4	0	6	1	4	15
7. Addiction	2	0	2	1	3	8
8. Adverts						
9. Curiosity	0	0	0	1	0	1
10. Indiscipline	1	0	0	0	1	2
11. Poor mental health	1	0	3	8	4	16
12. Tempting situations	0	0	1	1	0	2

APPENDIX E6

Table E2. Frequency Table of Themes (Global, Organizing and Basic) on Community Perceptions of Alcohol Use (continued)

	Community					
Theme	**Agorve**	**Gyegyeano**	**Ga Mashie**	**Tafo**	**Chanshegu**	**Total**
Alcohol Use Outcomes						
1. Failed life	0	1	0	0	3	4
2. Social deviance	0	2	3	4	1	10
3. Unsolved social/financial problems	1	0	3	0	0	4
4. Accidents	0	0	0	0	3	3
5. Obesity	0	1	0	0	0	1
6. Morbidity						
Alcohol addiction	1	2	0	2	3	8
Bodily weakness	2	0	0	0	0	2
Heart attack	1	0	0	0	0	1
Hypertension	2	2	0	1	1	6
Kidney disease	0	1	1	1	0	3
Liver disease	1	0	1	1	1	4
Physique changes	3	5	1	2	4	15
Poor mental health	2	0	0	1	0	3
Poor sexual health	2	1	0	0	0	3
Stomach illnesses	0	2	5	3	0	10
Stroke	3	5	4	4	1	17
Cancer	0	0	0	1	0	1
Diabetes	0	0	1	1	0	2
Epilepsy	0	0	0	2	0	2
Tuberculosis	0	3	0	0	0	3
Other illnesses	2	0	4	4	6	16
7. Mortality						
Alcohol-related death	0	1	3	1	1	6
Emergent Themes						
1. Non-adherence to alcohol consumption laws						
Purchase of alcohol by children	0	1	1	0	0	2
Parents/adults sending children to buy alcoholic beverages for them	0	1	1	0	0	2
Alcoholic beverage sellers selling to children	0	1	0	0	0	1
2. Substance abuse	0	0	5	2	4	11

APPENDIX F

Table F1. Types and Classification of Alcoholic Beverages in Study Communities

Type of Alcohol Beverage	Local Alcoholic Beverages: Company produced	Local Alcoholic Beverages: Home brewed	Foreign produced (Imported)	Constituents	Concentration % range (v/v alcohol)
Bitters	Adonko Agya Appiah Kasapreko Alomo Biegya Capital one Choice Famekor Fighter Herb Afrik bitters Joydadi Kakai Kamame Kiss Rosoroso Twabi mame Joy Twedie ginger Nana Takyi bitters Happy man bitters			Herbs, spices and botanicals added to spirits or spirit-fortified wine	28% to 45%v/v[19]
Wine		Palm wine		Sap of the palm tree	24 hours fermentation (1.5 to 2.1 %)/ 72 hours fermentation (4.5 to 5.2%)[20]
Spirits	Castle Bridge London dry gin Castle Bridge dry gin sachet drink Apet dry gin sachet drink Soccer sachet drink Striker Sachet drink	Akpeteshie	Jack Daniels Whisky Hennessey Cognac	Molasses distilled from sugarcane/ palm sap/ grains such as barley, corn etc.	40% to 50%v/v[21]
Spirit-based cocktails		Atemuda		Gin infused with cannabis	40% to 50%v/v
Cereal-based beer	Club beer Guinness	Pito Brukutu	Smirnoff Ice	Fermented cereals such as malt, barley, rice, Sorghum, maize, etc.	2 to 3% v/v[22]

[19] (Asare, 2017)
[20] (Hutkins, 2019)
[21] (Acheampong, 1996)
[22] (Sefa-Dedeh et al., 1999)

APPENDIX G

Table G1. Themes (Global, Organizing and Basic) on Community Perceptions of Mental Health

Global Theme	Organizing Theme	Basic Theme	Description	Sample quotes
Characterisation of Mental Health Conditions	Definition of mental health	Psychologically healthy or unhealthy	Being psychologically healthy or unhealthy	*"… psychologically if you can't sleep…you are worrying on and off, that makes you become even sick. You grow lean even though you will be eating all right but because there is something worrying your mind… So psychologically you can be either healthy or not healthy."* *(Males, 60+years, Gyegyeano)*
		Disease of the head/mind	Mental illness is a disease of the head or mind	*"…for example, you may ask him "Have you eaten?" He may respond by saying, "I'm going to the barber." The responses he gives you have nothing in connection with the question that you ask. For that person he may be walking around in the area all the time… Yes, it has affected his mind but not his body"(Males, 18-34 years, Tafo)*
	Description of poor mental health or mental illness	Incomprehensible	Persons with poor mental health	*"With a person who is mentally sick, when he/she is talking, you notice that the words are nonsense." (Male, 35-59, Ga Mashie)*
		Views filthy things as clean	Persons with poor mental health view filthy things as clean	*"We are the ones who see those foods as filthy but for them it's clean. This is because their minds are not working well."(Males, 39-59, Gyegyeano)*
		Acts strangely	Persons with poor mental health act strangely	*"…But the mad person can fetch water and pour it on people." (Males, 39-59, Ga Mashie)*
		Eats filthy things	Persons with poor mental health eat filthy things	*"As for mad people, their case is different. What we think to be filthy, they see it to be clean and can eat them."* *(Males, 39-59, Gyegyeano)*

APPENDIX G1

Table G1. Themes (Global, Organizing and Basic) on Community Perceptions of Mental Health (continued)

Global Theme	Organizing Theme	Basic Theme	Description	Sample quotes
Characterisation of Mental Health Conditions (continued)	Description of poor mental health or mental illness (continued)	Appearance	Judging from their appearance, persons with poor mental health do not look normal from afar compared to persons with stroke	*"…but for someone who is insane, you will be able to tell the difference when the person is coming from afar"* *(Females, 18-34, Agorve)*
	Symptoms of poor mental health	Insomnia, excessive worrying, no peace of mind, weight loss without being on diet, feelings of sadness	Poor mental health comprise of symptoms such as insomnia, lack of peace of mind, weight loss without being on diet, and feelings of sadness	*"Psychologically if you can't sleep… you are worrying on and off, that makes you become even sick. You grow lean even though you will be eating alright but because there is something worrying your mind." (Males, 60⁺years, Gyegyeano)* *"If the person has no peace of mind it can lead the person into alcoholism." (Females, 18-34, Chanshegu)* *"An issue is worrying you. You feel down [sad]. You might think that when you drink it that problem will vanish. But you don't know that when it leaves." (Males, 18-34, Ga Mashie)*
	Classifications	Severe (Dangerous) Mind not working well	Persons with severe mental conditions are dangerous and have their minds not working well	*"This medical condition is also a difficult one. There was one madman who was beheading some residents in a village." (Males, 35-59, Gyegyeano)* *"For a mad man, his condition is even worse. That mad person can kill someone". (Males, 35-59, Gyegyeano)*
		Less severe (Thinking or worrying too much, feeling sad- (Depression))	Persons with less severe mental conditions think or worry too much and feel sad	*"An issue is worrying you. You feel down [sad]. You might think that when you drink it that problem will vanish. But you don't know that when it leaves." (Males, 18-34, Ga Mashie)*

APPENDIX G2

Table G1. Themes (Global, Organizing and Basic) on Community Perceptions of Mental Health (continued)

Global Theme	Organizing Theme	Basic Theme	Description	Sample quotes
Causes of Mental Health Problems	Biological	Genetic	Poor mental health could be passed genetically through the family line	*"Madness could be in the family line…" [Males, 60+years, Tafo]*
	Stressful life events	Deprivation	Stressful life events such as food insecurity causes poor mental health	*"…In addition, what to eat….When you have to depend on another person for food…[you will think a lot] [Males, 60+ years, Chanshegu]*
		Unemployment	Stressful life events such as unemployment leads to poor mental health	*R: That is what my brother here said. People worry a lot.* *R2: if jobs are created, all these health conditions will reduce. [Males, 35-59 years, Tafo]*
		Union disruptions (divorce)	Stressful life events such as divorce leads to poor mental health	"*It's because some people's wives have left them. So they start thinking." [Males, 35-59 years, Agorve]*
		Family responsibilities	Stressful life events such as numerous family responsibilities lead to poor mental health	*"This is because men have a lot of responsibilities that may make them worry a lot. They have to bring money home, take care of their wives and children, and others etc. so they are mostly stressed out." [Males, 35-59 years, Tafo]*
		Financial problems	Stressful life events such as financial problems lead to poor mental health	*"You become sad or depressed when you are in some financial difficulties. That alone can bring about sickness." [Males, 18-34 years, Tafo]* *"Let me add something to what my brother has said. If you don't have money or you are needy, and lonely, you worry a lot. If you worry a lot, it can affect your brain…" [Males, 35-59 years, Tafo]*
	Chronic conditions	Stroke	Chronic conditions such as stroke leads to poor mental health	*"I think stroke has different ways of manifesting itself in the patients. Some people who get stroke become mentally unstable." [Males, 35-59 years, Tafo]*

APPENDIX G3

Table G1. Themes (Global, Organizing and Basic) on Community Perceptions of Mental Health (continued)

Global Theme	Organizing Theme	Basic Theme	Description	Sample quotes
Causes of Mental Health Problems (continued)	Supernatural forces	Witchcraft and curses	Mental conditions are believed to be caused by witches and curses	*"Unfortunately, for us in Africa, it is only the oldies, the old women who are regarded as witches. They will say that old lady at that place is the cause of your illness…so that is the belief. The moment there is a chronic illness or disease [including mental illness] in the family, then they attribute it to someone who is causing it. [Males, 60⁺years, Gyegyeano]* *Madness could be… a curse as a result of a wrong doing [Males, 60+years, Tafo]*
	Substance abuse	Alcohol	Substance abuse leads to severe mental illness	***I:** What about divorce?* ***R:** As for that one you will drink till you get mad." [Males, 60+ years, Tafo]*
Expected Consequences of Mental Health Problems	Chronic diseases	Stroke	Poor mental health could lead to stroke	***R1:** Look! Serious thinking can even give you stroke.* ***R2:** yes lots of thinking [Males, 60+years, Ga Mashie]*
		Hypertension	Poor mental health could lead to hypertension	***I:** Depression. How does that affect our health? Does it give us good health or ailment to us?* ***R:** It causes BP. [Males, 35-59 years, Chanshegu]*
	Death	Suicide-related death	Poor mental health could cause people to commit suicide	*I: who will be punished?* *R: the one who is dead [referring to the young man who committed suicide]. He will be lashed very well at where he has gone to. If someone has left you, why would you have to go and drink poison? [Males, 60+ years, Ga Mashie]*
		Non-suicide-related death	Poor mental health could lead to death	*"As for me I see that it is often thinking. Thinking can kill you when you have not been sick [Males, 60+ years, Ga Mashie]*
	Substance abuse	Alcohol abuse	Poor mental health could lead to alcohol abuse	*"….when it happens to someone [poor mental health as a result of marital dissolution] when the person does not drink poison, he might drink excessively to the extent that he cannot even walk well." [Males, 60+ years, Ga Mashie]*

APPENDIX G4

Table G1. Themes (Global, Organizing and Basic) on Community Perceptions of Mental Health (continued)

Global Theme	Organizing Theme	Basic Theme	Description	Sample quotes
Coping Strategies for Mental Illness	Religion	Praying	Individuals pray to cope with poor mental health	*The doctor told me that if I don't stop worrying I will be bed-ridden ..... It was from that time that I stopped worrying. I then started praying about every need of mine." [Females, 60+years, Gyegyeano]*
		Consulting spiritualists	Individuals consult spiritualists to cope with poor mental health	*"...the moment there is a chronic illness or disease [mental illness] in the family, then they attribute it to someone who is causing it. That is the belief and then they consult a spiritualist. And then he too because he wants money, will endorse it." [Males, 60+years, Gyegyeano]*
	Social networks	Confiding in a trustworthy person	Individuals with poor mental health confide in trustworthy persons to cope with poor mental health	*"There are some people when they get somebody to trust and he tells him what is worrying him....even just by listening to the person alone it appears as if there is a heavy load lifted off your head because you have been able to come out with what is worrying you". [Males, 60+years, Gyegyeano]*
	Substance Use or Abuse	Alcohol	Individuals resort to alcohol use to cope with poor mental health	*"When you are troubled with something, you might want to drink a little to help deal with the pain". [Males, 60+years, Agorve]*
		Smoking	Individuals resort to smoking to cope with poor mental health	*Others too smoke to minimize depression. [Male, 35-59, Chanshegu]*

APPENDIX G5

Table G2. Themes (Global, Organizing and Basic) on Community Perceptions of Alcohol Use

Global Theme	Organizing Theme	Basic Theme	Description	Sample quotes
Socio-Cultural Context of Alcohol Use	Socio-cultural norms in communities	Acceptability of alcohol consumption	Some community members find alcohol consumption as acceptable (i.e. have positive) attitudes while other community members do not find alcohol consumption as acceptable (i.e. have negative attitudes) towards alcohol consumption	*"Alcohol has no kind of benefit." [Males, 60+ years, Chanshegu]* *"…But you know what? The best of all the alcohol is the local gin (akpeteshie). For me, I think it's natural alcohol. It is God who made it. That is the alcohol that we should all drink. But those that have been manufactured are those that are causing the sickness. Some people also mix the local gin [Akpeteshie] with certain chemicals, which gives it a different colour and taste. Such drinks are what people also like to drink." [Males, 18-34 years, Tafo]*
		Availability	Alcoholic drinks available in the communities (Company and home-brewed alcoholic drinks and imported foreign drinks) Bitters Beer Spirits Palm sap wine	*"There is Adonko and Kakai bitters. [Females, 18-34 years, Gyegyeano]* *"We have Agya Appiah and Twedie Bitters." [Females, 18-34 years, Gyegyeano]* *"[Akpeteshie] local gin is here, Alomo, Herbafrik, Castle bridge and Capital One." [Males, 35-59 years, Ga Mashie]*
		Mostly consumed alcoholic beverage brands	Akpeteshie Adonko Bie Gya	*"There is one alcoholic drink that people drink a lot even though it has never been advertised on tv or on radio. That is the local gin (akpeteshie)… People here drink it a lot. Have you ever seen or heard an advert on the local gin?" [Males, 35-59 years, Gyegyeano]* *"As for we the men, we drink Adonko and Bia Gya." [Males, 35-59 years, Tafo]*

APPENDIX G6

Table G2. Themes (Global, Organizing and Basic) on Community Perceptions of Alcohol Use (continued)

Global Theme	Organizing Theme	Basic Theme	Description	Sample quotes
Socio-Cultural Context of Alcohol Use (continued)	Socio-cultural norms in communities	Format of use	group consumption, individual purchases, solitary consumption	*"Festivals, funerals and others. During these occasions, people drink in groups. But of course, some people will also drink alone in their various homes. [Males, 35-59 years, Gyegyeano]*
		Pattern of drinking	Moderate and hazardous use	*But now people just drink it indiscriminately. They are those who haven't eaten and then they go to drink alcohol. [Females, 60⁺ years, Gyegyeano]*
		Socio-economic status and alcohol drink preference	The rich (Guinness, Club and Star beer) The poor (Akpeteshie)	*Those who have money buy Guinness, Club, and Star and other beers. If you don't have money you have to go in for the local gin. [Females, 60⁺ years, Tafo]*
		Social change and alcohol use	More permissive government policies	*"In the olden days there was license. Those who sell beer and even local gin. When we were young, local gin used to be licensed so local gin wasn't just sold. Now it has become a fashion". [Females, 60+ years, Ga Mashie]*
			Advent of Islamic Religion which restricts alcohol consumption	*P4: Funerals still take place but now Islam is has come.* *P2: So they [community members] no longer prepare alcohol. [Females, 60⁺ years, Chanshegu]*
		Circumstance of alcohol use	Rites of passage	*I: I want to know, the occasions that takes place in this community where alcohol is shared which makes people drink?* *R: Outdooring [almost all the respondents said it at the same time]* *R2: or funeral. They share Club [beer] and we drink it. [Females, 35-59 years, Ga Mashie]*
			Religious festivities	*I: During what occasions do people normally drink alcohol?* *R: Christmas, Easter Monday, Valentine, during funerals, marriage ceremonies. During these occasions, we drink alcohol. [Females, 35-59 years, Tafo]*

APPENDIX G7

Table G2. Themes (Global, Organizing and Basic) on Community Perceptions of Alcohol Use (continued)

Global Theme	Organizing Theme	Basic Theme	Description	Sample quotes
Socio-Cultural Context of Alcohol Use (continued)	Socio-cultural norms in communities	Circumstance of alcohol use	Political and keep fit social club activities	*"Yes. The organisers [of the political rallies] won't give you money to go buy the alcohol. They will buy it for you. And since you don't have money you have no option than to drink the free drink. It's also a strategy employed by the organisers. After you have become drank you will forget the money they promised you for coming out to support a particular political party."[Females, 35-59 years, Gyegyeano]* *R2: when people are just going for jogging they drink.* *R3: Just yesterday, someone died so they were going for jogging. They had two bottles [of alcoholic beverages]." [Females, 18-34 years, Ga Mashie]*
			Weekends	*"They drink it all the time. Saturdays and Sundays are the days that people drink a lot." [Males, 18-34 years, Ga Mashie]*
			Medicinal purposes	*"Some people mix it [alcohol] with certain herbs for medicinal purposes. For instance, to cure piles." [Females, 18-34 years, Chanshegu]*
			Enhancement of sexual performance	*R: …and if the person wants to have sex too he can drink.* *R1: Adonko is used to have sex. [Males, 35-59 years, Ga Mashie]*
			Appetizer	*"Some of us women also use them as appetizers when we give birth. We drink it in order to have appetite for food. That may become a habit." [Females, 60+ years, Tafo]*
			Occupational use	*"Some people also take to enable them work harder. Like going to the sea shore to pull net and farming." [Females, 18-34 years, Agorve]*

APPENDIX G8

Table G2. Themes (Global, Organizing and Basic) on Community Perceptions of Alcohol Use (continued)

Global Theme	Organizing Theme	Basic Theme	Description	Sample quotes
Socio-Cultural Context of Alcohol Use (continued)	Socio-cultural norms in communities	Circumstance of alcohol use	For settlement of conflicts and payment of fines	*"When there's a dispute between two people a drink can be used to seal the settling of the misunderstanding; wrong doers [in the community] are also fined with drinks…" [Males, 60+ years, Agorve]*
		Community role of alcohol	Traditional rites	*"We use alcohol during naming ceremony, when praying and during certain customary rites." [Males, 18-34 years, Gyegyeano]*
			Conflict resolution and Payment of fines	*"When there's a dispute between two people a drink can be used to seal the settling of the misunderstanding; wrong doers are also fined with drinks." [Males, 60+ years, Keta]*
		Other prevalent community norms	Increased prevalence of adverts on alcohol consumption	*R1: Adonko bitters.* *R2: This bitters is advertised severally on TV* *R2: The adverts are just too much. [Females, 60+ years, Gyegyeano]*
			Outdoor table top alcohol vending points and indoors beer bar	*R2: you see, the thing is that at first the beer bars were not plenty here. Local gin bar was not plenty here. But now even if someone has prepared banku and stew and is selling, the person sells alcohol too. This sachet drink will be sold beside it.* *R3: and the one being poured into the glass [Females, 60+ years, Ga Mashie]*
Alcohol Use Causes	Biological	Genetically inherited and a learned behaviour	Alcohol use behaviour is passed on genetically or learned in the family	*R3: There are people who do habitual drinking. Sometimes too it's from the family. For some families they booze so …* *R2: …when you are born into it you become part of it?* *R3: Yes [Males, 60+ years, Gyegyeano]*
	Stressful life events	Poverty	Stressful life events such as poverty causes persons to consume alcohol	*I: What are some of the issues in life that make people drink alcohol here?* *R: another is poverty [Males, 35-59 years, Tafo]*

APPENDIX G9

Table G2. Themes (Global, Organizing and Basic) on Community Perceptions of Alcohol Use (continued)

Global Theme	Organizing Theme	Basic Theme	Description	Sample quotes
Alcohol Use Causes (continued)	Stressful life events	Unemployment	Stressful life events such as unemployment causes persons to consume alcohol	*I: What are some of the issues in life that make people drink alcohol here?* *R: Another is… not having a job. [Males, 35-59 years, Tafo]*
		Relational disruptions	Stressful life events such as relational disruptions (divorce) causes persons to consume alcohol	*I: What are some of the issues in life that make people drink alcohol here?* *R: Divorce is one of them. [Males, 35-59 years, Tafo]*
		Heartbreak	Stressful life events such as heartbreak causes persons to consume alcohol	*"Some also drink because they have been jilted by women. So the idea is to drink and sleep and forget about the hurt. But when they become sober the hurt or pain is still there." [Females, 35-59 years, Gyegyeano]*
		Tragedy	Stressful life events such as tragedy causes persons to consume alcohol	*"For some people, it is when they are troubled. There was a pastor whose wife and two children drown in a river so he took to drinking." [Males, 35-59 years, Agorve]*
		Excessive worrying	Stressful life events such as poverty causes persons to consume alcohol	*I: What are some of the issues in life that make people drink alcohol here?* *R: Another is worrying too much... [Males, 35-59 years, Tafo]*
	Supernatural forces	Curses	Individuals drink because they have been cursed	*"There are others who are also cursed to resort to drinking so that when they drink, people will think it is the alcohol that is killing them but in actual fact it is someone who has placed a curse on them."* *"There are two types. We have the spiritual and the physical. If someone causes you to start drinking spiritually, you can never drink to your fill. You drink anytime you get the chance. But for the physical one, it is on your own accord that you will drink." [Males, 35-59 years, Tafo]*
		Evil spirits	Evil spirits such as demons cause people to drink	*"Some of them are demon-caused. Drinking too much alcohol can also cause epilepsy."[Males, 60+ years, Tafo]*

APPENDIX G10

Table G2. Themes (Global, Organizing and Basic) on Community Perceptions of Alcohol Use (continued)

Global Theme	Organizing Theme	Basic Theme	Description	Sample quotes
Alcohol Use Causes (continued)	Emotional causes	Happiness and sadness	Happiness or sadness could lead to drinking of alcohol	*R: excitement, worrying and other things* *R2: please the Gas' say that excitement is found in the bottle. [Females, 18-34 years, Ga Mashie]*
	Individual choice			*"Drinking of alcohol is based on an individual's choice..." [Males, 35-59 years, Chanshegu]*
	Adverts	Adverts on television	Television adverts can cause persons	*"The kind of adverts [television adverts] about alcoholic drinks is also a contributory factor. The adverts are very convincing. [Males, 18-34 years, Tafo]*
	Alcohol Use Disorders	Alcohol addiction/dependency	Addiction or dependency on alcohol cause individuals to consume alcohol	*R: Some people also drink because they have to drink every day. R2: everyday if they want to eat, they will have to drink. They keep on doing that until it becomes chronic. Whether or not he will eat, he still has to drink. Someone can wake up in the morning just to go and sit at a place where alcohol is being sold. [Females, 60+ years, Ga Mashie]*
	Social networks	Peer influence	Individuals friends could	*"Some also drink because of peer pressure."[Females, 60+ years, Gyegyeano]*
	Poor mental health	Worrying too much and depression	Worrying too much and depression could cause individuals to drink alcohol	*I: Ok. What makes people drink alcohol?* *R: Happiness, worrying too much, and depression. [Males, 35-59 years, Ga Mashie]*
	Other individual factors	Curiosity	Curiosity could cause persons to drink alcohol	*"I chanced upon a young man who was drinking a new alcoholic beverage. He didn't know the ingredients used in preparing the drink. I was worried about the fact he himself didn't know what was used in preparing. After I spoke to him he left the drink in the bar and went home. For some people they just want to try alcohol and see what it is made off. They want to know the effect the alcohol will have on them. Whether it will make them do good stuff or bad stuff. [Females, 35-59 years, Tafo]*
		Indiscipline	Indiscipline could cause persons to drink alcohol	*"For some people it's mere indiscipline [that causes them to drink]." (Females, 35-59, Agorve)*

APPENDIX G11

Table G2. Themes (Global, Organizing and Basic) on Community Perceptions of Alcohol Use (continued)

Global Theme	Organizing Theme	Basic Theme	Description	Sample quotes
Alcohol Use Causes (continued)	Other individual factors	Tempting situations	The proliferation of communities by beer bars serve as tempting situations which leads to drinking of alcohol	*R: the drinking bars are too much [too many].* *I: the bars are plenty huh?* *R: temptation [Laughter] [Males, 18-34 years, Ga Mashie]*
Alcohol Use Outcomes	Individuals	Failed life	Alcohol consumption leads to failed life among individuals	*"The young men and women are drinking too much. There's Kakai [meaning monster]. How can you name an alcoholic drink monster. So it means it catches people. No wonder it's destroying their lives." [Females, 60+ years, Gyegyeano]*
	Society	Social deviance	Alcohol consumption leads deviance in the society	*"A person who drinks can just shout for no reason and behave unruly. Some of them even fight." [Females, 60+ years, Tafo]*
	Unsolved problems	Unsolved relational problems (divorce)	Alcohol use does not solve relational problems	*"Someone's wife left him and he took to drinking. But with this, you must remember that when you drink and fall asleep, you'll wake up to your problems." (Males, 35-59, Agorve)*
		Unsolved Financial problems	Alcohol use does not solve financial problems	*"When I came back, my last born was the only one left to complete school. So I used the little money I had on me after selling the car to pay his fees. My last born is 26. Nothing was progressing again. If I tell you what I went through, you will weep for me. If I tell you I'm an "okada" man, will you believe? I am an "okada" man… As for drinking, so many things causes it. Even when you drink, it does not solve the problem for people." [Males, 60+ years, Ga Mashie]*
	Accidents	Pedestrian accidents	Alcohol consumption leads to pedestrian accidents	*"…because you can drink it and be on the main road and be knocked down by a vehicle." [Females, 60+ years, Chanshegu]*
	Morbidity	Obesity	Alcohol consumption leads to obesity	*"The local drinks, to be precise make people obese. When they stop drinking, they reduce in weight again." [Males,18-34 years, Gyegyeano]*
		Chronic Diseases	Stroke	*"When you drink, it is very easy to get stroke. [Females, 60^{+} years, Agorve]*

APPENDIX G12

Table G2. Themes (Global, Organizing and Basic) on Community Perceptions of Alcohol Use (continued)

Global Theme	Organizing Theme	Basic Theme	Description	Sample quotes
Alcohol Use Outcomes (continued)	Morbidity	Chronic Diseases	Hypertension	*"Drinking too much can cause one to have hypertension." [Males, 60+ years, Agorve]*
			Diabetes	*"Some cause it. Like diabetes, if you drink excessively you will get it." [Males, 18-34 years, Ga Mashie]*
			Kidney disease	*"Yes, because it [alcohol] affects your kidney and your liver." [Females, 60+ years, Tafo]*
			Liver disease	*"You cough, you become pale, and also your strength is reduced. It also gives liver problem [Females,18-34 years, Gyegyeano]*
			Tuberculosis	*"Well, drinking causes TB because an affected person could drink from a glass and another could also drink from that same cup and then get infected." [Males,18-34 years, Gyegyeano]*
			Cancer	*R: there are many types of cancer. There is throat, there is breast and others.* *I: ok. So what causes it?* *R: And alcohol. The strong ones. [Males, 60+ years, Tafo]*
			Epilepsy	*"Drinking too much alcohol can also cause epilepsy" [Males, 60+ years, Ga Mashie]*
		Alcohol use disorders	Alcohol addiction/ dependence	*"...because of that it can happen and you will drink it to an extent that, just like he earlier on said, if there is something that bothers you, after drinking you will forget about it. Tomorrow, you do same. By the time you realize, you will be an addict." [Males, 60+ years, Chanshegu]*
		Heart attack	Excessive alcohol consumption leads to heart attacks	*" Too much intake of alcohol can cause heart attack [Females, 18-34 years, Agorve]*
		Poor mental health	Alcohol consumption leads to poor mental health	*I: What about divorce?* *R: As for that one, you will drink till you get mad. [Males, 60+ years, Tafo]*

APPENDIX G13

Table G2. Themes (Global, Organizing and Basic) on Community Perceptions of Alcohol Use (continued)

Global Theme	Organizing Theme	Basic Theme	Description	Sample quotes
Alcohol Use Outcomes (continued)	Morbidity	Physique changes	Facial changes	*"It makes them lose blood. It also makes their face look a certain way with red lips. So, you will be able to tell that a person drinks the moment you see them." [Females, 18-34 years, Agorve]*
			Premature aging	*"Some have made their mind to drink all the time so they get addicted. If he doesn't drink for a day, he doesn't feel ok. Such people age quickly. [Males,18-34 years, Gyegyeano]*
		Poor sexual health	Low sperm count	*"It also give low sperm count." [Males, 18-34 years, Agorve]*
		Functional limitations	Bodily weakness	*"If you drink too much, you will become weak. Your body won't be as strong as it used to be. That's if you drink it too much." [Males, 60+ years, Agorve]*
	Mortality	Alcohol-related death	Alcohol consumption leads to alcohol-related death	*"It [alcohol] can kill you at any time. You drink excessively but you don't eat when its noon time. The drink you have taken will now be requesting for food [Males, 60+ years, Ga Mashie]*
Emergent Themes	Non-adherence to alcohol consumption laws	Purchase of alcohol by children	Some children purchase alcohol for their personal consumption	*"Now the children go and buy their own alcoholic drink. I just stare at them. They buy those sachet alcoholic drinks." [Females, 60+ years, Gyegyeano]*
		Parents or adults sending children to buy alcoholic beverages for them	Some parents or adults in the community send children to buy alcoholic beverages for them	*"So they [Parents or adults] send the little children. Nowadays, if a child is sent to go buy the drinks, the child has his/her own money so if the child wants some, he will go and buy it and drink it. He will say that he was sent." [Females, 60+ years, Ga Mashie]*
		Alcoholic beverage sellers selling to children	Alcoholic beverage sellers sell alcohol to children	*"What disturbs me most is how school children from the age of 10 buy the alcoholic drinks that come in a sachet. I was so disturb that day. How can I go and tell the seller not to sell to the children. The seller might accuse me of not wanting his/her business to flourish." [Females, 60+ years, Gyegyeano]*

APPENDIX G14

Table G2. Themes (Global, Organizing and Basic) on Community Perceptions of Alcohol Use (continued)

Global Theme	Organizing Theme	Basic Theme	Description	Sample quotes
Emergent Themes (continued)	Substance abuse	Consumption of substance-based cocktails	There is co-use of cannabis and spirits among some members of the communities	*"We have local gin (akpeteshie). There's also a local gin that's prepared with marijuana." [Males, 60+ years, Tafo]* *"There is one being sold which is called marijuana drink. Do you know it?" [Females, 60+ years, Ga Mashie]*
			Co-use of prescription medication (Tramadol) and alcohol	*"The youth now drink Tramadol… they buy the tramadol and mix any kind of drink and consume." [Females, 18-34 years, Chanshegu]* *"When they drink it, you will think the person is suffering from epilepsy. Somebody drunk it and his mouth was foaming. And it was due to the tramadol." [Females, 18-34 years, Chanshegu]*
			Co-use of nails and alcohol	*"They put nails in the alcoholic drinks overnight". [Females, 18-34 years, Chanshegu]*
		Consumption of other substances	Excessive use of non-prescribed cough syrups by adults	*I: What did you say its name was?* *R: 'Benylin', 'Cetralin' [most of the respondents said it at the same time] [Females, 18-34 years, Ga Mashie]*

APPENDIX H

FOCUS GROUP DISCUSSION INTERVIEW GUIDE

Questions that yielded responses to participants' demographic characteristics, views on alcohol consumption and mental health

Introduction: – Identity and role of interviewer, general aims of research and role of participant in the process, issues of confidentiality, data access and ownership. Socio-demographic details to be gathered on standardised form.

General Life History
Could you tell me a little bit about yourself?
Prompts: age, education, marital status, occupation, religious affiliation, etc.

Section A: Chronic Non-communicable Diseases

1. What types of chronic illness do you know?
   ***Prompts*:** with names – hypertension, diabetes, stroke, asthma, arthritis, epilepsy, sickle cell, cancer, mental disorders etc. *(Explore local words used for specific diseases)*
   (*When list of names is obtained, conduct sorting exercise to grade most severe to least severe illness, on a scale of 1 to 10; 1 being least severe and 10 being most severe*) Explore why illnesses have been graded the way they have been.
2. What do you think are the causes of chronic non-communicable diseases*? (Explore if chronic non-communicable diseases can be caused by infections or micro-organism and how this can happen)*
3. Do you think there is a difference between people living with stroke with different disabilities (physical, mental, cognitive, etc.) and people living with other forms of disabilities (physical, mental, cognitive, etc.) but are not living with stroke? *(Explore reasons)*

Section B: Social History of Chronic Diseases- (Alcohol Consumption)

1. What do you think causes people to consume alcohol in this community?
2. What types of alcohol are mostly consumed in this community*?*
   (Explore if types of drink consumed are based on social class)
3. In what ways do you think alcohol can affect the health of an individual?
   a. Do you think there is an association between alcohol consumption and chronic disease*? (Explore nature of association)*
4. In what circumstances do people mostly consume alcohol in this community? ***Prompts:*** *during funerals, social gatherings, job loss and other economic disruptions, marital disruption, political campaigns, etc.*
5. What roles does alcohol perform in this community? *(Explore views on religious functions, economic functions, political functions and social functions)*