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# SUBSTANCE USE DISORDERS AND REHABILITATION AMONG YOUTH IN GHANA AND EFFECTS ON THE FAMILY

**BY**

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# DECLARATION

I hereby declare that except for references to other people's work which have been duly acknowledged, this piece of work is my own composition and neither in whole nor in part has this work been presented for the award of a degree in this university or elsewhere.

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# DEDICATION

Dedicated to my dear husband Sampson Assah-Offei for his support, prayers, and encouragement. Then to my dear children, Nana Sam Sedem Assah-Offei and Victoria Naa Ayewa Assah-Offei, for their assistance, understanding and for the motherly deprivation they had to endure whilst undertaking this research, all my other children and my entire family. May the Lord Almighty bless and reward you richly.

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# ABSTRACT


## INTRODUCTION

Substance use disorders (SUDs) is a chronic, relapsing brain disorder that is characterized by compulsive seeking and use of addictive substances. SUDs among the youth continue to be a global public health concern. Treatment of SUDs places a heavy burden on public health systems. This study assessed the factors associated with substance use disorders and examine the effects and cost burden of SUDs and drug rehabilitation on families in Ghana.

## METHODS

The study used an embedded concurrent mixed-method design. It was conducted among 101 participants drawn from four (4) drug rehabilitation centres in the Greater Accra and Eastern Regions of Ghana, from December 2018 to February 2019. The quantitative component relied on a matched case-control design. One hundred and one (101) cases were enrolled from the only existing rehabilitation centres in Ghana, whereas 303 controls consisted of persons living in the same community as the cases but who had never used substances. A closed-ended questionnaire and semi-structured interview guide were used for face-to-face quantitative and qualitative data collection. Quantitative data were analysed using STATA version 15, and qualitative data were analysed using a thematic approach. The cost burden of substance use rehabilitation was calculated by summing the direct and indirect costs of managing drug users. The student t-test and one-way ANOVA test were used to compare average costs. Bivariate and multivariate analyses were done to test statistical relationships between outcome and observed explanatory variables. Statistical significance was set at a p-value of 0.1%, 1% and 5%.

**RESULTS**

Multiple logistic regression analysis showed that sex, age, highest educational level, employment status, residential status, and friendship with drug users had a statistically significant association with SUDs. Male participants had 1.5 (95% CI:1.2-2.5, p=0.001) times higher odds of SUDs than female participants. Participants aged above 20 years had lower odds of substance use disorders compared to those aged below 20 years ($p<0.01$). The estimated average household cost of rehabilitation was GHS 4,445.60 per month. The mean monthly indirect cost incurred by urban substance users (472.1 ± 196.40) was statistically significantly higher ($p<0.05$) than that of rural substance users (181.2 ± 100.30). Of 101 family members of substance users, 57.4% experienced a high intangible burden. Overall, the mean UNODC standard rehabilitation compliance was 3.0 (±0.0), signifying that the compliance standards at the rehabilitation facilities were inadequate.

**CONCLUSION**

Males, rural dwellers and younger age have a higher risk of SUDs. Hence public health strategies must target such vulnerable groups. To reduce the high-cost burden associated with the rehabilitation of substance users, the government and stakeholders must subsidize rehabilitation registration costs which contribute more than half of the economic burden of rehabilitation.

**KEYWORDS:** Substance use disorder, drug abuse, rehabilitation, youth, economic cost, Ghana.

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# LIST OF ABBREVIATIONS

DALYs – disability-adjusted life years

DSM – Diagnostic and Statistical Manual of Mental Disorders

HCV – hepatitis C virus

HIV – Human Immunodeficiency Virus

ICD – International Statistical Classification of Diseases

MeSH – Medical Subject Heading

PCL – PTSD Checklist

PTSD – Post-Traumatic Stress Disorder

PWID – People Who Inject Drugs

QOL – Quality of Life

SDQ – Strength and Difficulties Questionnaire

SES – Socio-Economic Status

SUD – Substance Use Disorder

UNODC – United Nations Office on Drugs and Crime

WHO – World Health Organization

WHOQOL-World Health Organization Quality of Life

# CHAPTER ONE

# INTRODUCTION

## 1.1 Background of the study

Substance use disorders (SUDs) among the youth continue to be a public health concern globally (Duperrouzel *et al*., 2018; Coffey & Patton, 2016; James, Smyth & Apantaku-Olajide, 2013). It is a chronic, relapsing brain disorder that is characterized by the compulsive seeking and use of addictive substances, including but not limited to alcohol and mood-altering substances (Kumar, Dangi, & Pawar, 2019; National Institute on Drug Abuse [NIDA], 2019). Some mood-altering substances include cocaine, cannabis, opioids, opiates, and synthetic drugs such as amphetamines (World Drug Report, 2018). The addictive substances often result in adverse consequences on the individual, family, and society's psychological, social, and physical functioning (NIDA, 2019).

Some of the consequences of substance use on the individual are expressed as an intense and, sometimes, uncontrollable craving, along with compulsive seeking of the drug and abuse that persists although it results in harmful consequences (Rich, 2011). According to Wani (2016), it changes the core structure of the brain of the addicted person and how it functions. It causes mental health illnesses such as depression, bipolar mood disorder, anxiety, paranoia- excessive suspicion, aggressive behaviour, and hallucination (Corazza *et al*., 2014). This effect could be long-lasting and can lead to multiple harmful self-destructive behaviours. Substance use disorders also lead to legal and financial consequences and health risks such as human immunodeficiency virus (HIV) infection, hepatitis C virus (HCV) infection, and cardiovascular diseases (NIDA, 2019). Substance use has adverse health consequences on the youth and has a significant impact on social

dimensions such as academic performance and an increase in the incidence of school dropout (World Health Organization [WHO], 2011; Aaron *et al.*, 1999).

The effects of substance use and SUDs on the family and community include traumatic childhood experiences, especially by children of persons with SUDs, which contribute to addictive and criminal offences, comprising theft, burglary, sex work, shoplifting and affect family relationships (Daley, 2014). Families of persons with SUDs suffer from various forms of disruptions such as marital breakdown, loss of custody of children, stigma, emotional withdrawal, guilt and shame, loss of employment, financial instability, physical and psychological abuse, depression and ill-health (Schafer, 2011; Daley, 2014; Nimtz, 2014). Additionally, families experience unmet developmental needs, impaired attachment, legal problems, emotional distress and being a victim of violence (Lander, Howsare, & Marilyn, 2013).

Substance use problems have been increasing gradually since 2006; thus, it remains an important global issue (United Nations Office on Drugs and Crime [UNODC], 2019). Globally, the United Nations Office on Drugs and Crime report states that an estimated 255 million people (5.3%) abused illicit drugs, 25 million are regarded as substance abusers, and at least 15.3 million persons have substance use disorders (World Drug Report, 2018).

The prevalence of substance use among youth in Sub-Saharan Africa region ranges between 20.9% and 55.5% (Olawole *et al*., 2018; Jatau *et al.*, 2021). The prevalence of substance was 20.9% in Nigeria (Jatau *et al.*, 2021), was 7.4% in Egypt (Amin, Elnagdi, & Amer, 2019), and was 47.9% in Ethiopia (Birhanu *et al*., 2014). Substance use among the youth is more prevalent in developing countries than in developed countries (Salwan & Katz, 2014) and people living in low-income-

and middle-income countries (Suasnabar & Walters, 2020). The high prevalence of substance use is due to poverty, negative peer influences, broken homes, and lack of parental involvement and social support (Chesang, 2013; Jorge *et al*., 2018). The rise in global drug menace compelled the United Nations General Assembly to convene a Special Session (UNGASS) in 2016 ahead of its scheduled date of 2019 to achieve a significant reduction in the world drug problem (UNGASS, 2016).

Substance use differs by sex and age. For instance, men are reported to use substances more than women (Fawzy *et al*., 2012; Rabie *et al*., 2020). Risk factors identified to influence substance use are biological or genetic predispositon such as aggressive behaviour in childhood (Zucker *et al*., 2008; Grant e*t al.*, 2001), sensitivity to illicit drugs, low peer refusal skills (Grant *et al.*, 2001; Guo *et al.*, 2001; Brook *et al.*, 1990), socio-demographic characteristics such as age, gender (Becker & Hu, 2008), developmental stage (Gallimberti *et al*., 2015), environmental risk factors such as lack of parental supervision (Hill *et al*., 2016; Zucker *et al*., 2008), broken home, poor academic performance (NIDA, 2003), drug experimentation (Zucker *et al*., 2008; Sher & Rutledge, 2007; Chassin *et al*., 2002), availability of drugs (Sher & Rutledge, 2007; Brook *et al*., 1999), and community poverty (Hawkins *et al*., 1995; Herting & Guest, 1985).

Treatment of substance use disorders has placed a heavy burden on public health systems. Only one out of every six persons with substance use disorders has access to treatment globally (World Drug Report, 2018). The global annual number of preventable drug-related deaths was estimated as 187,100 in 2018, often due to an overdose and lack of access to treatment (World Drug Report, 2018). Many countries, including Ghana, have large shortfalls in providing substance use treatment services (World Drug Report, 2018).

Substance use treatment services such as drug addict rehabilitation are employed to manage drug addicts. Drug addiction rehabilitation is the process of using medical and psychotherapeutic treatment for managing dependency on addictive substances such as alcohol, prescription drugs, and narcotic drugs such as heroin and amphetamines. (Marlatt & Donovan, 2012). The overall objective of a well-established drug rehabilitation service is to enable the client to confront drug addiction, help drug addicts prepare to re-enter society, cease drug abuse, and avoid the overall negative impact of drug addiction (WHO, 2014). The quality of the rehabilitation facilities is evaluated using the international standards for the treatment of drug use disorders developed by UNODC. This is a standard tool to support nations in their efforts to develop an effective, evidence-based and ethical treatment for drug use disorders. The standards are intended for all those involved in the policy development, planning, funding, delivery, monitoring and evaluation of treatment services and interventions for drug use disorders (WHO, 2020).

However, there are limited drug addiction treatment facilities in the world. Only 1.7 health service beds per 100,000 population are available for rehabilitation globally (WHO, 2014). A report by the UNODC in 2018 revealed that only one in six drug addicts worldwide receive rehabilitation treatment annually (World Drug Report, 2018).

Assessment of substance use disorders among the youth has become important because it is vital to understand the impact of substance use disorders on their family and community and whether their visit to rehabilitation has improved their quality of life. Research into substance use disorders among the youth remains a grey area in sub-Saharan Africa, specifically in Ghana, hence, the need to study the phenomenon and its related factors among the youth in Ghana.

### 1.2 Statement of the Problem

Substance use disorder such as alcohol and illicit drug addiction is a global public health concern (Deenhardt *et al.*, 2008). The advancement of drug addiction rehabilitation has helped patients overcome substance use disorders, re-enter society, and avoid the overall negative impact of drug addiction on the family and society (WHO, 2014). However, youths addicted to substance use suffer from mental health illnesses such as depression, bipolar mood disorders, anxiety, paranoia-excessive suspicion, aggressive behaviour, and hallucination (Corazza *et al*., 2014). Harmful use of substances by the youth also results in poor academic performance, increased school dropout, co-morbidity burden, decreased life expectancy, decreased quality of life, and increased mortality rate (Schulte & Hser, 2013; Ghoreishi *et al*., 2017; UNODC, 2018). SUDs influence the individual and affect the family and community (Rowe, 2012; Lander, Howsare, & Byrne, 2013). For instance, substance use disorders result in a rise in juvenile delinquency and financial burden on the family (Kumpfer, 2014).

Addiction to alcohol and illicit drugs, especially among the youth, has become a public health concern in Ghana ( Appiah *et al.*, 2017; Adzrago, 2018). The prevalence of substance use, such as alcohol among the youth in Ghana, was 39.3% (Doku, Koivusilta, & Rimpelä, 2012). According to the World Drug Report in 2017, Ghana is placed at the 14$^{th}$ position globally for cocaine use; in addition, Ghana is considered a cannabis production hub (Lucia, 2019; Domestic Drug Consumption in Ghana).

Even though addiction to alcohol and illicit drugs is common, only a few drug rehabilitation facilities are available to treat persons with substance use disorders (Kabore *et al*., 2019). These facilities do not provide addiction support services for relapse prevention (De Lugo, 2019). Some

of these drug rehabilitation centres are situated inside psychiatric institutions that pose stigma issues for persons with substance use disorders and their families (Appiah *et al*., 2017). The private-owned drug rehabilitation centres, such as the non-governmental funded by faith-based organizations in Ghana, charge high fees for rehabilitation services and apply religious approaches to drug rehabilitation which imposes restrictions on the type of patients they admit (Appiah *et al.,* 2017).

Although the evidence on substance use disorders is well documented (Duperrouzel *et al*., 2018; National Institute of Drug Alcohol, 2019; World Drug Report, 2018; Lander et al., 2013)., there is limited evidence on the risk factors influencing substance use disorders, the economic burden of drug addiction on their families, experiences of the youth who are most at risk of becoming addicts and those receiving treatment at the drug rehabilitation facilities. Also, most of the studies conducted on substance use disorders in Ghana were on men only (Andoh-Arthur *et al*., 2020), adolescents aged 15-19 years (Doku, Koivusilta, & Rimpelä, 2012; Addo *et al*., 2016; Asante & Kugbey, 2019), street children (Asante & Nefale, 2021) and those in senior secondary schools (Adu-Mireku, 2003; Nkyi, 2014). There is a dearth of studies on the youth and those receiving treatment for drug addiction or substance use disorders at the drug rehabilitation centres in Ghana from age 15 to 35 years.

There is limited evidence of the quality of existing drug rehabilitation in Ghana. Therefore, there is the need for evaluation of rehabilitation facilities in Ghana, based on the United Nations Office on Drug and Crime (UNODC) guideline. In this light, the research seeks to assess substance use disorders and their associated factors and the effects of substance use disorders and rehabilitation on families in Ghana. This study is designed to inform future interventions, such as creating public

awareness of the health implications of drug abuse to curb the drug addiction menace in Ghana. The findings of this study would also be useful for developing family prevention of drug addiction programmes in the form of multi-dimensional family therapy and individual cognitive behavioural therapy.

### 1.3 Research Questions

The following questions guided the study:

i. What factors are associated with substance use disorders among Ghanaian youth?
ii. What is the economic cost of rehabilitation from substance use disorders on drug addicts and their families in Ghana?
iii. What are the experiences of the youth who are in rehabilitation for substance use disorders and their families in Ghana?
iv. How well do drug rehabilitation centers in Ghana comply with the United Nations Office on Drug and Crime (UNODC) guideline?

### 1.4 Objectives of the study

#### 1.4.1 General objective

The general objective of the study was to determine factors associated with substance use disorders among Ghanaian youth and families and their rehabilitation experience

#### 1.4.2 Specific objectives

The specific objectives of this study were to;

1. Determine the factors associated with substance use disorders among Ghanaian youth.

2. Describe the economic cost of rehabilitation from substance use disorders on drug addicts and their families in Ghana.
3. Describe the experiences of the youth who are in rehabilitation for substance use disorders and their families in Ghana.
4. Determine compliance of drug rehabilitation centers in Ghana to the United Nations Office on Drug and Crime (UNODC) guideline.

### 1.5 Justification

There are no studies that focused on the risk factors of SUDs, together with experiences of youths at the rehabilitation centres and economic burden on families. Therefore, the current study will provide information on Risk factors of SUDs in Ghana, Economic cost of rehabilitation in Ghana, Experiences of the youth with SUDs and families in rehabilitation and Quality standards of SUD rehabilitations in Ghana

A few studies provided some information on SUDs in Ghana: experiences of people who are in rehabilitation for substance use disorders (Adzrago *et al.*, 2018); there are limited studies on the factors associated with substance use disorders among youth in Ghana (Kabore *et al*., 2019). This study, therefore, contributes to exploring the experiences of the youth who are in rehabilitation for substance use disorders and their families in Ghana. Knowing the experiences of the youth in rehabilitation for substance use disorders will enhance the development of training materials and provide mentoring opportunities for drug rehabilitation practitioners on how to manage drug rehabilitation related issues. Also, knowing the experiences of youth would aid the community, the health sector, particularly drug rehabilitation centres, non-governmental organizations, and the government to formulate strategic measures that would help minimize substance use disorders in

the communities. The findings of this study will also help persons with SUDs undergoing treatment at the rehabilitation centres adhere to counselling therapy to improve their self-esteem and enable them to have positive coping skills for handling stress and mental health issues.

Knowing how drug rehabilitation centres in Ghana comply with the United Nations Office on Drug and Crime (UNODC) guideline would be used by the Government, including the Ministry of Health and the Ghana Health Service, to improve and promote adherence to international standards of care for drug rehabilitation practitioners. It will also provide evidence for policy direction on the need to strengthen existing drug rehabilitation centres to provide comprehensive care for persons with substance SUDs.

### 1.6 Organization of the thesis

The thesis is organized into five main chapters. Chapter one introduces the research background, the statement of the problem, the research objectives and research questions, the significance of the study, and how the study is organized. Chapter two presents a literature review of theoretical and empirical studies to provide a theoretical grounding for the study. Chapter three entails the methodology by detailing the research process, the data collection method, an in-depth interview guide developments and methods and modes of the interviews conducted. Chapter four presents the data analysis results from documentations, field interviews, and surveys. It also discusses the main findings of the research. Chapter five, the final chapter, presents a summary of the empirical outcomes, the conclusions and recommendations of the study.

### 1.7 Conceptual Framework

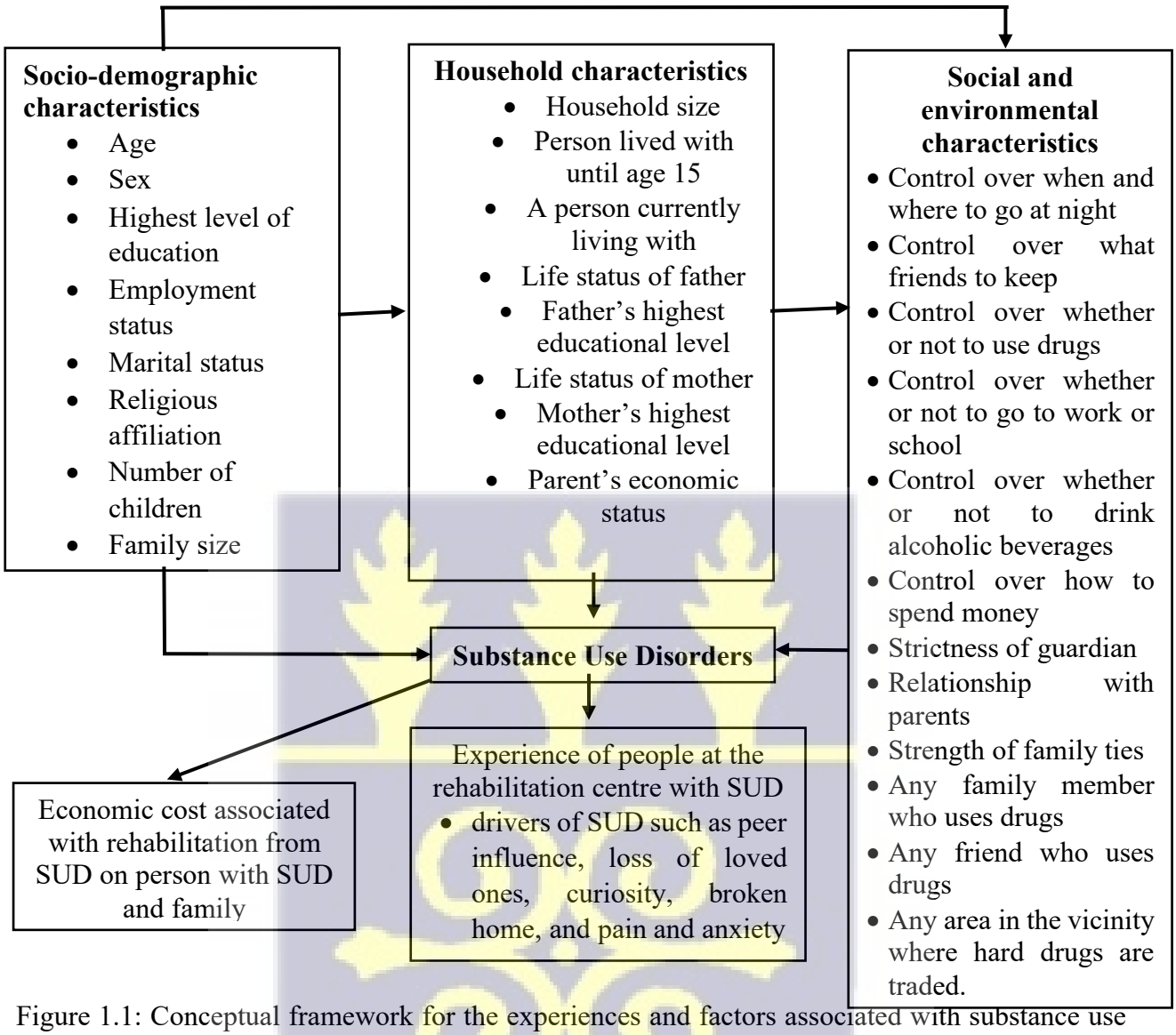


Figure 1.1: Conceptual framework for the experiences and factors associated with substance use disorders.

The model is based on Andersen and Newman's healthcare utilization propounded in 1973, and the Health Belief Model (HBM) propounded in 1991. The Andersen and Newman healthcare utilization model proposes that utilization of health services is determined by three factors, namely, predisposing factors, enabling factors, and need factors.

The predisposing factors are the socio-demographic, household characteristics, social and

environmental factors such as age, sex, the highest level of education, employment status, marital status, religious affiliation, etc. that are associated with SUD. The enabling factors include caregiver support and physical access to the rehabilitation that facilitate access to health services. Need factors comprise the perceived and/or actual need for health services (Li et al., 2016).

This socio-demographic characteristics, household characteristics, social and environmental factors, and its association with substance use disorders among the youth in rehabilitation are presented in Figure 1.1. The socio-demographic characteristics are age, sex, the highest level of education, employment status, marital status, religious affiliation, number of children, family size, and current residence. Generally, socio-demographic characteristics such as employment status are associated with SUDs (Teixidó-Compañó *et al.,* 2018. Also, the association between SUD and socio-demographic characteristics may be a reflection of the higher substance use behaviour among males globally (Gallimberti *et al*., 2015; Birhanu *et al.*, 2014). According to Fothergill *et al.* (2012), persons with postgraduate education are less likely to become drug addicts than middle school leavers.

The social and environmental values are: control over when and where to go at night, control over what friends to keep, control over whether or not to use drugs, control over whether or not to go to work or school, control over whether or not to drink alcoholic beverages, control over how to spend money, the strictness of guardian, relationship with parents, the strength of family ties, any family member who uses drugs, any friend who uses drugs, and any area in the vicinity where hard drugs are traded. Social and environmental characteristics, such as any area in the vicinity where substances were sold, influence youth to engage in substance use (Kabore *et al.*, 2019). According

to Kabore *et al.* (2019), areas such as slum communities sell substances at low prices and make them available for use.

# CHAPTER TWO

# LITERATURE REVIEW

## 2.1 Introduction

This chapter presents a review of the literature in relation to the study objectives. The themes covered in this chapter are the introduction, patterns of substance use, understanding the problem, factors associated with substance use disorders (SUDs), effects of SUDs on the user, effects of SUDs on the family and gaps in the literature. Substance use remains highly prevalent among adolescents and young adults. Different combinations of poly-drug use and the ever-changing compositions of newly synthesized drugs may make it difficult to catch up in terms of determining the correlates of substance use and their effects on users. It is estimated that only 16% of people with SUDs are in treatment; hence, studies involving people in treatment may not give a comprehensive understanding of the questions being asked. Prisons are high-risk environments for infectious disease and drug use (UNODC, 2016).

Allwood (2012) declared that an in-depth evaluation of the literature permits researchers to generate suitable research questions and techniques. The research articles included in the review were obtained through the definition of the key terms, search words, fields and exclusion and inclusion criteria. The search parameters included research papers published in recognized peer reviewed journals, written in English with a named author and full-text articles. The researchers searched for the key phrase, 'determinants of SUDs'. The search was limited to the titles and keywords of the research articles. The search was not limited to any journal to ensure that the search was comprehensive (Briner et al., 2009). The major search engine from online research databases for most of the articles used were PubMed, JSTOR and Sage. The following databases were finally used based on the responses from the search process – Elsevier, Springer, Taylor and

Francis, Wiley, BMC, PLOS ONE, and Pub Med. Keywords include “substance use”, “substance use disorders”, "lifestyle factors and substance use disorders" "peer factors and substance use disorders" and "socio-demographic factors and substance use disorders" published in the English language were used.

Boolean operators such as "AND" and "OR" were employed in combination to discover a wider scope of literature in the study area. Search terms include (Socio-demographic Use OR Lifestyle factors) AND (substance use disorders). The articles were scanned and assessed before chosen for the review. The criteria employed for selection comprises publication status, evidence, reference, and whether it was reviewed. The review is organized according to the specific objectives.

### 2.2 Biopsychosocial model of substance use disorder

The biopsychosocial model of addiction posits that biological/genetic, psychological, and sociocultural factors contribute to substance use. This model emerged in response to criticisms of the biomedical model, which has historically dominated the field of addiction studies. The traditional biomedical model was developed and is espoused by medical scientists for the study of disease, and its proponents also view addiction as a chronically relapsing brain disease with a genetic/biochemical cause. The biomedical or disease model of addiction views addiction as the manifestation of disturbances in measurable biochemical or neurophysiological processes in the afflicted individual. The biopsychosocial model shows that the biological, genetic, personality, psychological, cognitive, social, cultural, and environmental factors interact to produce the substance use disorder. The interaction of these factors to produce substance use problems is the core tenet of the biopsychosocial model of addiction.

### 2.3 Prevalence of Substance Use

The crucial stage of adolescence through to young adulthood is characterized by a rise in experimentation and the use of substances (Gray & Squeglia, 2018; Degenhardt *et al.*, 2016). Substance use is the continuous use of substances, illicit drugs, or the misuse of medicines or over-the-bench drugs with negative consequences (Panthee *et al*., 2017). Substance use can be grouped into illicit drugs and alcohol. According to Hall *et al.* (2008), illicit drugs are those for nonmedical use that are banned by national or international laws. Examples of illicit drugs are psychoactive drugs such as stimulants, sedatives, narcotics, hallucinogens, opioids, and cannabis. Psychoactive drugs are non-medical self-administered substances to offer mood-changing effects, intoxication, or altered self-image despite the knowledge of their adverse reactions (American Psychiatric Association, 1980). Examples of opioids are morphine, fentanyl, hydrocodone, codeine, oxycodone, and heroin; stimulants are amphetamines, methamphetamines, cocaine, caffeine, nicotine, ephedrine; inhalants are paint thinner and certain glues; hallucinogens are lysergic acid diethylamide (LSD), phencyclidine (PCP), psilocybin mushrooms, peyote, or mescaline; examples of cannabis are marijuana and synthetic cannabinoids (Gámez-Guadix *et al.*, 2013; Gureje *et al.*, 2007, Grossman, 2005). The commonly used substances among the youths in Ghana are cigarettes, alcohol, marijuana, heroin, cannabis, amphetamines, and cocaine (Aboagye *et al.,* 2021; Oppong-Asante, 2019; Asante, Meyer-Weitz, & Petersen, 2014; Doku, 2012).

The prevalence of the usage of illicit drugs was 5.6% worldwide (WHO, 2018). Particularly, the prevalence of substance use was 50.0% in Iran (Khezri *et al*., 2020). In the sub-Saharan African region, the overall prevalence of substance use was 41.6%, with the highest rate of 55.5% being in Central Africa Republic (Ogundipe *et al.,* 2018). Particularly, the prevalence of substance use among the youth was 52.5% in Rwanda (Kanyoni, Gishoma, & Ndahindwa, 2015), 27.5% in the

University of Uyo, Nigeria (Johnson et al., 2017), 47.9% in schools in Woreta town, Ethiopia, 20% in the University of Nairobi, Kenya (Musyoka *et al.*, 2020), and 6.5% in Mansoura University in Egypt (Khafagy, Gomaa, & Elwasify, 2021). A study in Ghana showed that 12% and 16% of the youth are engaged in alcohol and marijuana, respectively (Asante, Meyer-Weitz, & Petersen, 2014). Also, Aboagye *et al*. (2021) found that 39.5% of tertiary students are engaged in alcohol consumption in Hohoe Municipality in Ghana.

The adverse effects of substance use may be expressed at various levels, such as individuals, families, and communities. The effects of these problems have various dimensions comprising mental health issues, physical health, and economic consequences (Das *et al*., 2016; Gutierrez & Sher, 2015). People involved in continuous substance use are at risk of fatal and non-fatal overdoses (Mokdad *et al*., 2016). They also suffer from multiple disease burdens, and many have physical and mental comorbidities such as personality disorders, psychotic and affective disorders and socio-economic difficulties (Mueser *et al*., 2012; Ross & Peselow, 2012). Further, it leads to psychiatric disorders such as depressive symptoms, lethargy, insomnia, and hopelessness (Bond *et al*., 2005; Volkow & Li, 2005). Injection of substance use has resulted in a high prevalence of human immunodeficiency virus (HIV) infections, hepatitis C virus (HCV), and bacterial abscesses (Aas *et al.*, 2020; Gamarel *et al*., 2018). According to Nyongesa *et al.* (2021), people in substance abuse mostly have unstable housing situations, disrupted family, social relationships, and unemployment.

### 2.4. Substance Use Disorders

Substance use disorders (SUDs) is the continuous use of substances despite substantial harm and adverse consequences (Verdejo-García, Lawrence, & Clark, 2008). It describes both illicit or

illegal substances and the misuse of legal substances like alcohol, nicotine, or prescription drugs (Khalsa, 2021; Alblooshi *et al.*, 2016).

The American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5), outlines eleven symptoms of SUDs. These comprise:

1. Having a persistent wish to stop using the substance and/or continuously trying to reduce or control substance use.
2. Continuing to use the substances despite knowing that a physical or psychological health issue was likely caused or worsened by the substance.
3. Using the substance in larger amounts or over a long period than originally intended.
4. Exhibiting withdrawal symptoms when not using the substance.
5. Spending a significant amount of time trying to obtain the substance, use it, or recover from using it.
6. Stopping or decreasing social, work-related, or recreational activities due to substance use.
7. Building up a tolerance, where a larger amount of the substance is needed to experience an effect.
8. Having a strong urge to use the substance.
9. Continuing to use even when it causes an inability to fulfill work, school, or home-related responsibilities.
10. Continuing to use the substance even when it causes interpersonal problems or makes them worse.
11. Continuing to use the substance even in risky or physically dangerous situations.

Persons with SUDs are at risk of adverse health effects such as increased drug and non-drug related mortality (McDonald *et al.*, 2021; Gao, Robertson, & Bird, 2019; Hakansson & Berglund, 2013), physical morbidities comprising chronic obstructive pulmonary disease, hepatitis C, cancer, and self-reported somatic symptoms (Medved *et al.,* 2020), and underutilization of healthcare services (Swendsen *et al*., 2012).

Persons with SUDs also face stigma and discrimination. According to Kulesza *et al.* (2017), Kulesza, Larimer, and Rao (2013), and Van Boekel *et al.* (2013), adverse outcomes such as reduced wellbeing, self-esteem and self-efficacy, prevent healthcare-seeking and reduced compliance.

### 2.5 Factors associated with Substance Use

A host of risk factors come to play in influencing substance use or drug abuse. The influence of some of these risk factors depends on the individual's developmental stage. Several permutations of these factors interact to increase or lessen the risk of substance use. This review presents a modified version of the three main domains (Rhodes *et al*., 2003) under which these risk factors can be grouped. They include intrapersonal/interpersonal, micro-environmental and macro-environmental factors.

#### 2.5.1 Intrapersonal and interpersonal factors

Factors falling under this domain include intrapersonal/endogenous and interpersonal /exogenous traits that may determine the extent to which one would be involved in drug use. Some include socio-demographic characteristics, personality traits, physiological pain, mental illness and cognitive performance.

#### 2.5.1.1 Socio-demographic characteristics

**Sex:** Analysis of the 2002-2004 data on the Canadian Youth Smoking Survey showed that male youth were 45% less likely to have ever smoked a whole cigarette compared to female youth (Leatherdale, Hammond, & Ahmed, 2008), whiles Palamar, Kiang, and Halkitis (2014) reported no gender differences in the use of amphetamines, opioids, cocaine and marijuana. All other studies in this review reported otherwise. Men were 2.01 (95% CI, 1.93-2.09) times more likely to be alcohol abusers (Gauffin, Hemmingsson, & Hjern, 2013), 1.96 (95% CI, 1.43-2.69) and 1.27 (1.21-1.34) times more likely to report lifetime marijuana and inhalant use (Hodge, Marsiglia, & Nieri, 2011) compared to females. In another study, being male had a positive association with using marijuana and pro-drug personal norms, although not significant (Parsai, Marsiglia, & Kulis, 2010). Also, the risk of men having alcohol use disorders relative to abstaining from alcohol was 1.7 times that of women. Men were also less likely to be non-disordered drinkers than women (Schulenberg et al., 2015).

**Age:** A study in Nigeria found that youth who were 15 years or below were less likely to use substances (OR 0.61, 95% CI 0.44-0.88) (Atilola et al., 2013). Leatherdale et al. (2008) also reported the mean age of first use of alcohol, marijuana and cigarette to be 11.6, 11.5 and 12.6 years, respectively. Schulenberg et al. (2015) found that binge drinkers, current smokers and marijuana users at age 18 were at an increased risk of alcohol use disorders later at age 35. On the other hand, Lobato, Sanderman, Pizarro, and Hagedoorn (2016) reported no significant association between age and marijuana use among adolescents in Chile.

**Academic performance**: Reports from the Canadian Youth Smoking Survey showed an inverse relationship between the likelihood of drug use and academic performance. The chances that average or below-average students had tried marijuana were 1.57 (95% CI 1.27-1.94) and 2.73

(95% CI 1.99-3.76) times higher compared to above-average students, respectively (Leatherdale et al., 2008). Likewise, users of marijuana had poorer grades, lower participation in class, had more punishments, higher rates of absenteeism and were more likely to cheat at examinations than non-users (Finn, 2012). On the other hand, another study reported that having grades of at most C+ was associated with a lower risk of alcohol use disorder than a grade of B- or higher. Truant students also had an increased risk of alcohol use disorder (Schulenberg et al., 2015).

#### 2.5.1.2 Household Characteristics

**Socio-economic status:** The association between socio-economic status (SES) and adolescent substance use was studied by Humensky (2010) in a longitudinal study. Parents' highest educational level and income were used as proxies to determine adolescent socioeconomic status. Both educational level and income were significantly positively related to adolescent substance use, although the effect of income on the outcome was little. Having a college-educated parent increased the odds of binge drinking, marijuana use and cocaine use by 1.458 (95% CI, 1.19-1.788), 1.26 (95% CI, 1.088-1.54) and 1.614 (95% CI, 1.088-2.395), respectively as compared to having a parent whose highest education level was at high school. No significant associations were observed between the use of methamphetamines and other substances and parental educational level. Also, an increase in the annual income by $1000 increased the odds of binge drinking by 1.003 (95% CI, 1.001-11.004), marijuana use by 1.002 (95% CI, 1.000-1.003), after controlling for other variables and cocaine use by 1.002 (95% CI, 1.000-1.004) in the unadjusted model.

Atilola et al., (2013) also reported similar results with respect to the relationship between the educational level of parents and adolescent substance use, although findings were not statistically significant. A Swedish national cohort study reported conflicting findings. The authors used the parental level of education and position at the workplace as proxies for child SES. The likelihood

of alcohol-related problems increased with decreasing SES. Children in the lowest SES group were more likely to have alcohol-related disorders later in adulthood in both crude (HR 2.37 95% CI, 2.21 – 2.55) and adjusted estimates; adjusting for demographic and parental psychosocial disorders (HR 1.87 95%CI, 1.73 – 2.01) compared to children in the highest SES group (Gauffin et al., 2013). Similarly, having a parent with not more than a high school degree in another study was associated with a higher risk of alcohol use disorder or non-disordered drinking (Schulenberg et al., 2015).

**Household Size**: Akanni and Adayonfo (2016) studied the characteristics of adolescents that use gateway substances. The findings indicated that polygamous family background was significantly associated with tobacco use. Olufolahan and Adeyemi (2016) determined the prevalence and *correlates* of alcohol use among a sample of Nigerian semirural community dwellers in Nigeria. Alcohol use was more prevalent among the families with many members. The results also indicated that the determinants of any alcohol use include the family size and use.

#### 2.5.1.3 Social and Environmental Characteristics

**Parental Control**: A high level of parental psychological control undermines adolescent efficacy and autonomy efforts which leads to unhealthy self-concept and adjustment (Costa et al. 2019). It makes adolescents vulnerable to the development of risk behaviors including using tobacco, alcohol, and other substances. Additionally, a research by Romm and Metzger (2018) on Influence of Family Factors on Substance Use in Early Adolescents, reported a positive relationship between parental psychological control and substance use among adolescents suffering from unhealthy psychological conditions.

#### 2.5.1.4 Physiological disorders and mental disorders

A study was conducted to explore the role physical and mental problems play in using or abusing drugs. University students between 18 to 35 years in Iran were studied to explore the relationship between sedative use and physical complaints, alexithymia, perceived stress and anxiety. All the factors were positively correlated with sedative use (Gilan, Zakiei, Reshadat, Komasi, & Ghasemi, 2015). The use of sedatives in this context was regarded as abuse according to the International Treaties of Drug Control, where consumption of sedatives is equivalent to its abuse irrespective of amount and frequency of use. Forray, Gotman, Kershaw, & Yonkers (2014) attempted to determine the effect of depression on smoking behavior among pregnant women and found no significant difference in the smoking behavior among women with or without depression.

Furthermore, among 156 Hispanic adolescents admitted to drug treatment facilities, adolescents who had conduct disorder had twice the likelihood of heavy illicit drug use than those without conduct disorder (Gattamorta, Varela, Mccabe, Mena, & Santisteban, 2016). A cross-sectional study among 201 participants which investigated the personality traits of substance abusers showed that alcohol abuse was related to schizophrenia, hysteria, hypomania, psychopathic deviation and paranoia, as shown by chi-square and fisher's tests. Also, the use of heroin was significantly related to schizophrenia, depression and psychopathic deviation. Depression was the most common trait among the participants (Alaghemandan, Darab, Khorasani, Maniyan, & Barati, 2015).

### 2.5.2 Micro-environmental factors

It is well documented that a child's physical and mental growth and development is shaped to a large extent by their environment. Parents or guardians act or pose as models, whether knowingly or unknowingly, to their children, and many learned or acquired practices or behaviors are copied

from them (Maccoby, 1992). It is not surprising to come across several studies showing the effect of parental or familial substance use or abuse on their children. Other factors that constitute familial associations with drug abuse include socio-economic status, parenting behavior, chaotic home environment and abuse (whether physical, sexual or emotional).

#### 2.5.2.1 Peer and/or parental substance abuse

Adolescents are also greatly influenced by their peers, as they seek social acceptance and belonging (Bauman & Ennett, 1996; Maxwell, 2002). A cross-sectional study conducted in Ibadan, Nigeria, reported strong relationships between parental substance use and adolescent substance use. Adolescents whose mothers were substance users had a 2 fold increase in the odds of substance use compared to those whose mothers were non-users (AOR 2.00 95%CI 1.81-4.77), whilst paternal substance use increased the odds of adolescent substance use by 3 times (AOR 3.38 95% CI 2.00-4.47) (Atilola et al., 2013).

Another study also reported similar findings: substance use among family members or close peers increased adolescents' likelihood of marijuana use by 5.19 (95% CI 3.221-8.350) and 7.70 (95% CI 5.007-11.836), respectively. Adolescents who were non-dependent substance users were almost thrice as likely (AOR 2.67 95%CI 1.21-5.907) to become dependent users if they had family members who were also substance users compared to adolescents who were non-users (Lobato et al., 2016).

#### 2.5.2.2 Parenting behavior

Badr, Taha, & Dee (2014) studied the association between parental attachment and adolescent drug use among Middle Eastern adolescents. Parent-adolescent attachment had a significant negative correlation with alcohol and substance use; adolescents with weak attachments to their

parents had odds as high as 2.5 compared to those with strong attachments to their parents. On the other hand another study among Hispanic adolescents found that maternal attachment was negatively correlated with heavy illicit drug use; those with high levels of maternal attachment were twice as likely to be heavy illicit drug use compared to those who reported lower levels of maternal attachment (Gattamorta et al., 2016).

#### 2.5.2.3 Trauma

People who have undergone some form of trauma or abuse in their childhood may be at risk of substance abuse later in their adulthood. According to Cusack, Herring, & Steadman (2013) substance abusers who had ever been sexually abused had a significantly higher score on the PTSD Checklist (PCL), indicating that they had more severe symptoms of PTSD which acted as a mediator in alcohol intoxication and heavy drug use later in life. The odds of PTSD among those who had been victims of sexual assault was between 11 to 12 times higher than individuals without lifetime sexual assault. Consequently, the odds of alcohol intoxication and heavy drug use were 1.42 (95% CI, 1.18 – 1.70) and 1.43 (95% CI 1.20 – 1.71) times increased respectively. Similar, findings were also reported by Lopez-patton et al. (2016), where childhood trauma (physical, emotional and sexual) and depression were reported in higher frequencies among methamphetamine users relative to non-users. Use of methamphetamine was also associated with more severe forms of depression however contrary to findings by Cusack, Herring, & Steadman (2013) childhood trauma had no significant association with depression (Lopez-patton et al., 2016).

### 2.5.3 Macro-environmental factors

Community factors that are known to influence drug use or abuse include natural disasters, availability of drugs or the use of drugs being socially acceptable, acculturation and crime rate.

#### 2.5.3.1 Exposure to drugs

Out of a cohort of 1,037 adolescents studied in New Zealand who had early exposure to drugs were at an increased risk of becoming substance dependent, herpes infection, early pregnancy, criminal convictions and dropping out of school. The effect sizes for the mentioned outcomes after propensity score matching were between 2 and 3. In the same study the odds of early substance exposure were twice that of adolescents with conduct problems compared to those without conduct problems. The effects of early exposure to drugs were not very different among adolescents irrespective of history of conduct problems (Odgers et al., 2008).

#### 2.5.3.2 Religion and Religiosity

Some reports have cited religiosity as a protective factor against drug use and abuse. A score of self –reported religiosity below average among adolescents in Nigeria was associated with a 3-fold increase in the likelihood of substance use (Atilola et al., 2013). In a cross-sectional study among emerging adults (mostly in tertiary institutions) in New York City, agnostics and people who identified as "other" religion had increased in the odds of recent marijuana use compared to Christians respectively. This association was however no more significant when adjusted for attendance and self-ascribed importance of religion. Even though attendance was a significant protective factor, exposure to drugs attenuated its significance and effect in the adjusted model. This trend was observed in all models that used recent use of marijuana, cocaine, ecstasy or non-medical use of amphetamines each as outcomes. Exposure to drugs was an important and consistent predictor of substance use. The authors however, mentioned that the sequence of occurrence of exposure to users of the drugs and religiosity was not known (Palamar et al., 2014).

Hodge et al. (2011) reported an increased chance of alcohol use among young people who identified with a religion compared to those who did not identify with any religion. The odds of

substance use (alcohol, marijuana and inhalants) decreased as attendance at religious events increased. Lifetime use of illicit drugs also decreased with increasing attendance and self-ascribed importance attached to religion. The authors pointed out that the study was conducted among youths of Mexican heritage, where majority of them are affiliated with Catholicism which permits the use of alcohol and cigarettes among Latino religious networks. This observation could explain why religiosity in this study was positively correlated with alcohol and tobacco use but negatively correlated with the use of illicit drugs. Another study also found having an affiliation in the Catholic Church to be inversely related to recent cigarette or marijuana use, yet religious involvement had no significant effect on drug use (Parsai et al., 2010).

#### 2.5.3.3 Acculturation

A study was conducted to measure how culture and religion interact to influence substance use among Middle Eastern adolescents living in Beirut, Lebanon and Los Angeles, California. According to the results, the odds of alcohol use was higher among Christians and Muslims living in Los Angeles (2.1 95% CI, 1.3 – 3.1 and 2.9 95% CI, 1.7 – 4.5 respectively) compared to adolescents living in Beirut. However, the odds of substance use were only increased among Christians living in Los Angeles as compared to those living in Beirut (OR 2.1, 95% CI 1.3 – 3.1). This suggests that acculturation may be a stronger predictor of substance abuse than religion especially among Christians (Badr et al., 2014). Gattamorta and colleagues (2016) also found results that said otherwise. Acculturation was rather inversely associated with heavy illicit drug use; there was a 3% reduced odds of heavy illicit drug use among adolescents with higher levels of acculturation.

#### 2.5.3.4 Social networks and residence

In a cross-sectional study, where gay men were recruited at two separate gay lifestyle-themes events in New York City and studied to assess how gay neighborhoods and gay-centric networks influence drug use. Gay men who lived in gay enclaves or neighborhoods had an increased odds of methamphetamine or ecstasy use (OR 4.32 95%CI, 1.37 – 13.64 and 2.41 95%CI, 1.06 – 5.45 respectively) compared to gay men who lived in other neighborhoods. Similarly, the odds of using methamphetamine were 6 times higher among gay men with gay-centric networks compared to those with a more diverse network. The associations between cocaine and marijuana use and neighborhood of residence and type of networking were not statistically significant (Carpiano, Kelly, Easterbrook, & Parsons, 2011).

### 2.6 Effects of drug abuse on the user

As mentioned earlier in this review, substance use/abuse is not without accompanying health risks. The effect of these substances in themselves poses health consequences on one hand and may also make users engage in high-risk behaviors that increase their chances of acquiring infections such as HCV or HIV on another hand.

#### 2.6.1 Mental Health

Co-occurring HIV infection and SUDs among women in recovery increased the odds of psychological distress by almost 3 times and sleep problems increased in HIV symptoms. Opioid use was rather associated with reduced pain among the women. Alcohol, cannabis, sedatives and other substances had no significant associations with the health effects (McCabe, Feaster, & Mitrani, 2014). Supporting evidence from a ten-year perspective study in Norway, established a dose-response relationship between drug use and mental distress. The number of drugs used was also found to increase with severity of mental distress (Burdzovic, Lauritzen, & Nordfjærn, 2015).

Similar trends were reported for post-traumatic stress disorder (PTSD) and psychosis in other studies (Saunders, Lambert-harris, Mcgovern, Meier, & Xie, 2016; Smith, Thirthalli, Abdallah, Murray, & Cottler, 2010).

Furthermore, the use of methamphetamine/amphetamine or ecstasy (3, 4 – methylenedioxy-methamphetamine) were shown to increase the risk of depressive symptoms in a longitudinal cohort of secondary school students in deprived areas of Quebec. Adjusted estimates showed that methamphetamine /amphetamine, ecstasy and combined users were 1.6, 1.7 and 1.9 times more likely to have depressive symptoms the following year respectively as compared to non-users (Brière, Fallu, Janosz, & Pagani, 2012). Another study concurring with these findings reported higher levels of anxiety, depressive symptoms and even suicidal tendencies among inhalant dependent and inhalant abusing youth (Perron & Howard, 2009).

A cross-sectional study in Nepal to measure psychosocial problems among people with substance use disorders who were receiving treatment for SUDs found frequency of substance use per day and age of onset of substance use (before 20 years) to be significantly associated with higher scores on psychosocial problems measured using the Drug Use Screening and Inventory-Revised (Poudel, Sharma, Gautam, & Poudel, 2016). The negative effects of substance use were higher in severity among early-onset (before 18 years) users than late-onset users (Poudel & Gautam, 2017).

**2.6.2 Quality of life**

An Australian study found that PWID had a low quality of life (QOL) compared to the general population on all four domains of the World Health Organization Quality of Life (WHOQOL)-BREF, namely: physical, psychological, social relationship and environmental. Similar results were also found when comparing PWID to prisoners, and people with chronic heart disease or

spinal cord injuries. Although the results were compelling, use of other substances like alcohol that may have an impact on QOL were not accounted for in the analysis (Fischer, Conrad, Clavarino, Kemp, & Najman, 2013). Furthermore, people with SUDs are known to have low self-esteem and poor social interaction skills as reported by (Ersöğütçü & Karakas, 2016). Self-esteem and social function skills were found to be positively correlated in this study.

### 2.6.3 Fetal and childhood development

Prenatal use of cannabis specifically in the first month of pregnancy has been shown to be associated with an increased odds of anencephaly (AOR 1.7 95%CI, 1.3 – 4.9). Also using cocaine during the prenatal period was associated with an increased odds of cleft palate (AOR 2.5 95%CI, 1.1 – 5.4). The odds increased for women who used cocaine in the third month after conception to 6.8 (95%CI, 2.0 – 23) (van Gelder et al., 2009).

A prospective study to assess the effects of prenatal exposure to alcohol and other substances on mental health among school-aged children. The Strength and Difficulties Questionnaire (SDQ) was used to assess mental health in exposed children. The risk of mental health problems was increased among children with prenatal exposure compared to the control group. Children who were exposed to alcohol or other substances had higher SDQ scores compared to the reference group. The highest mean difference score observed between the two groups was in the hyperactivity subscale in the questionnaire. The difference between the mental health of children exposed to alcohol only and those exposed to other substances other than alcohol was not significant (Sandtorv, Hysing, Rognlid, Nilsen, & Elgen, 2017).

### 2.6.4 Lung health

Findings from a 40-year cohort study suggest a risk of lung cancer among men who smoke marijuana. Self-reports of a lifetime use of marijuana above 50 times was associated with a hazard ratio of 2.12 (95% CI, 1.08 – 4.14) of lung cancer in the adjusted model (tobacco smoking, respiratory conditions, alcohol use and SES were controlled for). The association between lung cancer and lifetime tobacco however, did not show a dose-response relationship. There were few study participants who smoked marijuana only and so stratified analysis could not provide any persuasive results indicating a causal relationship between smoking marijuana and lung cancer (Callaghan, Allebeck, & Sidorchuk, 2013).

### 2.6.5 Sexual behavior

Assessment of HIV sexual risk behavior in a random sample of patients receiving outpatient and residential treatment of SUDs showed that patients with alcohol dependence had three times the odds of unprotected sex when drunk than alcohol users who did not suffer from dependence and those who used cocaine had twice the odds compared to non-users (Tross et al., 2015). Current and former drug injectors had twice the odds of unprotected sex with a non-primary partner and current drug injectors also had an increased number of unprotected sex. The odds of having unprotected sex were 1.93 and 3.04 for cocaine users and problem drinkers respectively. No significant associations were observed between sexual risk behavior and marijuana or opioid use (Tross et al., 2015).

Ninety four percent of 164 adolescents reported psychological or social problems as a result of alcohol intake in a study by Arias, Hawke, Arias, & Kaminer (2009). Also, the severity of symptoms associated with eating disorders were positively correlated with the number of times

they got drunk weekly. The correlation coefficient however, was weak but statistically significant ($r = 0.19$, $p = 0.011$).

Among homeless adults in Los Angeles, poly drug use though intravenous route were 27.1 times likely to have HCV infection, mono-drug injector had an odds ratio of 12.5 non-injection drug users had an odds ratio of 2.9 of HCV infection compared to non-users. The rate of HCV between non-injection drug users and non-users were not different, confirming the documented evidence that PWID are at an increased risk of HCV infection (Gelberg et al., 2012).

**2.7 Effects of drug abuse on the family**

Not only does substance use and abuse impact negatively on users, their families or on the people they live with may also be affected. Familial relationships are sometimes marred as a result of comorbid mental problems and substance use and the health of family members in question are sometimes affected. Chermack et al., (2008) and Epstein-Ngo et al., (2014) examined the effects of distal (parental alcohol problems, childhood conduct disorders and youth aggression) and proximal (current drug and alcohol use and psychological disorders) factors among substance abusers in treatment programs on the frequency of partner and non-partner aggression. Proximal and distal factors were positively correlated with aggression and injury outcomes (Chermack et al., 2008). The results showed that some proximal and distal factors took direct or indirect paths to aggression. Youth aggression was directly associated with higher levels of past-year non-partner aggression (OR=1.54, $p < .001$) and at the same time indirectly associated with non-partner aggression through psychological distress. Alcohol use was also directly linked to non-partner aggression, whereas cocaine use and marijuana use were directly related to Partner Aggression (Epstein-Ngo et al., 2014).

Mothers in substance abuse treatment programmes who had comorbid mental disorders like anxiety and depression were more likely to have their children expressing internalizing (OR 2.0 95%CI, 1.0-4.0) and externalizing (OR 3.4 95%CI, 1.5-7.6) behaviors compared to mothers in the program who were without comorbid mental disorders (Hser et al., 2015). Comorbid PTSD and substance use among fathers were also positively associated with hostility, aggression and neglectful parenting behavior towards their children (Stover, Hall, McMahon, & Easton, 2012).

In Finland a study was carried out to measure the relationship between co-occurring substance abuse and maternal psychiatric problems and the psychological, behavioral, emotional and mental health of in their children between the ages of zero to twelve years. Using children whose mothers had neither substance abuse disorders nor psychiatric disorders as reference, the odds of psychological disorders was 1.33 (95% CI, 1.04 – 1.69) among children whose mothers had SUDs, 1.56 (95% CI, 1.33 – 1.84) among children whose mothers had psychiatric disorders and 1.48 (95% CI, 1.16 – 1.89) among children whose mothers had both SUDs and psychiatric disorders. Similarly, for behavioural and emotional disorders, children with substance abusing mothers had a two-fold risk (95% CI, 1.73 – 2.63) of the mentioned disorders compared to children whose mothers had neither disorder. The odds of behavioural and emotional disorders were 1.92 (95% CI, 1.65 – 2.24) and 2.62 (95% CI, 2.13 – 3.24) for children of mothers who had psychiatric disorders and both SUDs and psychiatric disorders respectively.

The magnitude of the associations was slightly increased and remained significant for mood disorders and neurotic, stress-related and somatoform disorders among the children. These results show that children of substance abusing mother's run a risk of mental health problems and subsequent substance abuse in adolescence and adulthood (Ranta & Raitasalo, 2015). Reports from the Quebec longitudinal study of child development showed a positive and significant association

between long-term exposure to nicotine in the household among infants and physical aggression and anti-social behavior in late childhood. Children who had transient exposure to nicotine were 2.04 (95% CI, 1.58 – 2.64) and 1.76 (95% CI, 1.30 – 2.39) times more likely to have physical aggression and anti-social behavior respectively, compared to children with no nicotine exposure. Interestingly, children with continuous exposure nicotine exposure rather had an odd of 1.40 (95% CI, 1.17 – 1.68) for physical aggression and 1.34 (95% CI, 1.11 – 1.70) for anti-social behavior compared to children with no exposure. The authors however mentioned that the model for these estimates suffered from omitted variables bias (Pagani & Fitzpatrick, 2013).

### 2.8 Economic Cost of SUDs Rehabilitation

There are no studies that comprehensively researched on economic cost of rehabilitation, experiences of youths in substance use rehabilitation as well as assessed quality standard of rehabilitation. A systematic review study by Addo et al, (2018) on Economic Burden of Caregiving for Persons with Severe Mental Illness in Sub-Saharan Africa, reported that there is paucity of studies on the burden of severe mental illness on caregivers in sub-Saharan Africa.

Allers et al, (2015) also carried out a systematic review study on Economic Impact of Epilepsy in Sydney, Australia compared different items of expenditures and reported that drugs and hospital services were the major sources of direct costs of treatment.

### 2.9 Experiences of Youth with SUDs in Drug Rehabilitation Centres

The experiences of youth with SUDs at the drug rehabilitation centres and their views aided in identifying the drivers of SUDs. The experiences comprised drivers of SUDs such as peer influence, loss of loved ones, curiosity, broken home, and pain and anxiety. Youths are mostly influenced by peers to participate in substance use (Gudonis-Miller *et al*., 2012).

Drug rehabilitation experiences improve social life and family neglect (Pettersen et al., 2018).

Drug rehabilitation impacts positively on self-care and developing a concern for others (Kaskutas et al., 2014).

Prangley et al. (2018) noted five themes for successful recovery of SUDs, namely "improved understanding of substance uses and SUD status, reduced substance use, improved physical and psychological health, relationship success and employment success".

### 2.10 Treatnet Quality Standards

The Treatnet Quality Standards for Drug Dependence Treatment and Care Services was developed based on UNODC/WHO principles to help reduce the consequences of drug abuse on health, crime rates and other negative effects on individuals, families and communities globally. Its implementation is based on two core values, namely: human rights and good practice.

Human rights: The Universal Declaration of Human Rights are to be applied in all aspects of the treatment procedure. The client/patient's human rights are expected to be respected and upheld through ensuring anonymity and confidentiality, informed consent, testing HIV voluntarily, avoiding using physical or psychological coercion, contact with family members and ensuring transparent procedures for complaints.

Good practice: although not compulsory, centers are encouraged to adopt this core value to promote improvement of treatment services. This comprises of five key components including prioritizing client needs, promoting multidisciplinary teamwork, ensuring written policies and standard operating procedures that stem from evidence-based medicine, good data management practices and monitoring and evaluation (UNODC, 2012).

There are nine main domains of the TREATNET Quality Standards on which the questionnaire for assessing quality of treatment services is based. A summary of the nine domains is given below:

1) **Availability and accessibility of drug dependence treatment:** where voluntary substance dependence services are easily accessible and available, with all limitations removed. This domain also includes making services open to all without discrimination with respect to race, gender, religion, caste or any other socio-demographic characteristic of the clients.
2) **Screening, assessment, diagnosis and treatment planning:** providing timely and tailor-made services to clients using standard tools in clinical assessment and diagnosis.
3) **Evidence-based drug dependence treatment:** using the best evidence available in psychosocial and pharmacological treatment that is socio-culturally relevant to the setting with the full involvement of a multi-disciplinary team.
4) **Human rights and the dignity of the patient/client:** ensuring the protection of the human rights of the client and maintaining confidentiality and client's privacy. Also, the client should not be discriminated against on any grounds whatsoever.
5) **Targeting special subgroups and conditions:** giving special attention to underserved populations and marginalized groups such as adolescents, women, sex workers and pregnant women.
6) **Drug dependence treatment as an alternative to prison and in prison settings:** addressing drug dependence as one that needs medical attention instead of incarceration or providing drug treatment services in prisons.
7) **Community-based treatment:** involving stakeholders in decision making concerning planning and delivery of treatment services.

8) **Clinical governance:** application of effective policies to enable the service organization achieve its goals. Good clinical governance can be ensured by putting in place service policy respective service protocols, treatment protocols, qualified staff, supervision, monitoring systems, communication structures, financial and human resources.
9) **Policy development, strategic planning and coordination of sources:** ensuring a continuum of care, capacity building for staff, coordination and balance of general and specialized treatment needs (UNODC, 2012).

### 2.10.1 Quality of drug treatment services

Brannigan, Schackman, Falco, & Millman (2004) used a scale developed by 22 experts (researchers, federal policy makers and health practitioners) which consisted of nine key elements on which the quality of drug treatment programmes for adolescents were assessed. The key elements include: assessment and treatment matching, comprehensive integrated treatment approach, family involvement in treatment, developmentally appropriate programs, engaging and retaining teens in treatment, qualified staff, gender and cultural competence, continuing care and treatment outcomes. The reliability of the scale gave a score of 0.79 (Cronbach's alpha). Most of the programs performed poorly on the nine key elements. No program was able to attain a score of at most 4 out of a total score of 5 on each element. The mean scores were mostly between 2 and 3 for almost all the nine elements. Also, gender and cultural competence, engaging and retaining teens in treatment and assessment and treatment matching were the elements that had the poorest performance scores.

The second study considered in this review examined the use of evidence-based treatment in substance abuse treatment programmes that serve American-Indians or Alaskan Natives. The use of Cognitive Behavioral Therapy, Motivational Interviewing and Relapse Prevention Therapy

were among the psychosocial evidence-based treatment that were commonly used. With regard to use of culturally appropriate interventions, only Relapse Prevention Therapy and Motivational Interviewing fulfilled the criteria (Novins, Croy, Moore, & Rieckmann, 2016).

In a study published by Samhsa (2015) on Screening and Assessment of Co-occurring Disorders (CODs) in the Justice System, a monograph was used to examine a wide range of evidence-based practices for screening and assessment of people in the justice system with co-occurring mental and substance use disorders. The monograph reviews a range of selected instruments for screening, assessment, and diagnosis of SUDs and CODs in justice settings and provides a critical analysis of advantages, concerns, and practical implementation issues (for instance, cost, availability, training needs) for each instrument. A number of the evidence-based instruments described in this monograph are available in the public domain. The use of evidence-based approaches for screening and assessment is likely to result in more accurate matching of offenders to treatment services and more effective treatment and supervision outcomes (Shaffer, 2011).

## 2.11 Summary of Systematic Review

### 2.11.1 Factors associated with substance abuse

Being male was associated with a relatively higher risk of substance use (Leatherdale, Hammond, & Ahmed, 2008; Gauffin, Hemmingsson, & Hjern, 2013; Hodge, Marsiglia, & Nieri, 2011) although not all studies reported significant results (Parsai, Marsiglia, & Kulis, 2010) . Older teens were also found to be more likely to abuse substances compared to younger teens (Atilola et al, 2013; Schulenberg et al, 2015; Leatherdale et al, 2008). Substance abuse was negatively correlated with academic performance as well (Schulenberg et al, 2015). With respect to socio-demographic

status, reports failed to agree with one direction of correlation. Some studies reported a positive correlation between likelihood of substance abuse and SES (Humensky, 2010), whiles other studies reported a negative correlation (Gauffin et al, 2013; Schulenberg et al, 2015).

Furthermore, pre-existing mental health problems or disorders were reported to be possible risk factors for substance abuse. Although depression among pregnant women was not reported as a risk factor for smoking behavior, depression as well as conduct disorder, hysteria, schizophrenia and other mental disorders were significantly associated with substance abuse (Gilan et al, 2015; Gattamorta et al, 2016; Alaghemandan et al, 2015).

Substance abuse among close relatives and peers greatly influenced its abuse among adolescents. Also increasing parental attachment decreased the likelihood of substance abuse among adolescents (Bauman & Ennett, 1996; Maxwell, 2002; Atilola et al, 2013; Lobato et al, 2016).

People who had undergone some form of trauma or abuse in their childhood were reported to be at risk of substance abuse later in their adulthood. Trauma or abuse were physical, emotional or sexual (Lopez-patton et al., 2016). One study also showed that scores of Post-Traumatic Stress Disorder (PTSD) were significantly high among people who had a history of abuse (Cusack, Herring, & Steadman, 2013).

External factors such as early exposure to drugs and acculturation (Badr et al., 2014, Gattamorta et al, 2016), especially in a more industrialized setting influenced substance use among young adults and adolescents (Odgers et al., 2008). Religiosity, increased spirituality and high self – perceived importance of religion in one's life was protective against substance use (Atilola et al, 2013; Palamar et al., 2014). There were inter and intra religious variations in how these characteristics influenced substance use. For instance, having a religious affiliation was protective

against the use of illicit substances whiles identifying with the Catholic Church increased the chance of alcohol use since its use is generally accepted (Parsai et al, 2010).

### 2.11.2 Effects of substance use disorders on the user

Major health risks that were found to be associated with substance use include mental disorders/problems (for both direct and prenatal exposure) such as psychological distress, mental distress, psychosis, depression and anxiety (McCabe, Feaster & Mitrani, 2014; Saunders, Lambert-harris, Mcgovern, Meier, & Xie, 2016; Smith, Thirthalli, Abdallah, Murray, & Cottler, 2010; Briere et al, 2012; Perron & Howard, 2009, Sandtorv et al, 2017). Other health risks were anencephaly (in prenatal exposure) (van Gelder et al., 2009), cancer (Callaghan, Allebeck, & Sidorchuk, 2013), low quality of life (Fischer et al, 2013) and hepatitis C virus infection and sexually transmitted diseases (as a result of high risk sexual behavior) (Tross et al., 2015, Arias et al, 2009; Gelberg et al, 2012).

### 2.11.3 Effects of substance use disorders on the family

Children of substance abusers were often subject to negative parenting behaviours including neglect, hostility and aggression (Epstein-Ngo et al., 2014; Chermack et al, 2008; Ranta & Raitasalo, 2015). Additionally, children were more likely to suffer from emotional, psychological and behavioural disorders (Hser et al., 2015; Stover et al, 2012). Partner aggression (on the part of the person with SUDs) was also a common effect of substance use (Pagani & Fitzpatrick, 2013).

### 2.11.4 Quality of drug treatment services

Only a handful of studies assessed the quality of drug treatment or drug rehabilitation services. None of the studies applied the Treatnet Quality Standards, however some of the elements assessed in these studies can be found in the Treatnet Quality Standards. Most of the programmes or

facilities performed poorly on the scales of assessment that were applied (Brannigan et al, 2004; Novins et al, 2016).

### 2.12 Gaps in literature

In Ghana some studies have reported on the prevalence of drug abuse among schools and among street children. There is fair knowledge on the kind of drugs used and abused and on the patterns of use. On the contrary data on alcohol and tobacco use in the country is abundant since their use is more socially acceptable. Questions regarding the correlates of illicit drug use and abuse and their effects on users and their families in the Ghanaian setting need to be answered. Although such data may be difficult to come by especially since drug use is criminalized in Ghana, it is not an impossible task to do. With regards to the quality of drug abuse treatment services, there is paucity of data on quality assessment especially in Ghana. Drug use and abuse is increasing steadily worldwide together with their negative effects on users and on society. Drug use in the Ghanaian setting must be first understood in order to inform prevention and curative interventions.

# CHAPTER THREE

# METHODOLOGY

## 3.0 Introduction

This chapter presents the methods used in carrying out the study. It describes the research philosophy, study design, study settings, population, sampling, data collection methods and tools, data analysis techniques, and ethical considerations.

## 3.1 Philosophical Underpinning of the Study

Research philosophy is an established belief about how data regarding a phenomenon should be gathered, analyzed, and applied (Saunders *et al*., 2009). It informs the suitable choice of research design for the study. It entails deciding on a research approach, expressing the problem, collecting data, processing, and analyzing the results. The types of research philosophies are positivism, interpretivism, critical realism, pragmatism, and postmodernism.

This research discusses three research philosophies associated with the scope of the study, namely, positivism, interpretivism and critical theory of belief systems of people (Green, 2017; Romani *et al*., 2018).

Positivism is a research philosophy that describes and predicts what occur in the social world by finding regularities and causal links between its constituent elements (Burrell and Morgan, 1979). According to Donaldson *et al.* (2013), the positivist research paradigm aids in the development of hypothesis from the theories and conceptual framework associated with the study and the use of an appropriate statistical test.

Interpretivism comprises researchers interpreting elements of the study. It uses the idea of construction to understand human beings as subjects who actively create, deploy, or reinforce

(Scauso, 2020). According to Hiller (2016), it is based on the understanding and knowledge of the people through life experiences because every individual has a unique idea which can be interpreted differently. The positivist and interpretivist paradigms have their strengths and weakness. It has been argued that the strengths of the positivist philosophical research paradigm are the weakness of the interpretivist approach and vice versa (Bhattacherjee, 2012).

### 3.2 Research Approach

This study follows both the inductive (the researcher started with particular observations and measures and then moved to detecting themes and patterns in the data) Antwi and Hamza, (2018) and deductive (theoretical structure and conceptual framework were constructed and then empirically observed) Imenda, (2014) approaches to assess the factors influencing substance use disorders (SUDs) among Ghanaian youth and described the experiences of the youth who are in rehabilitation for SUDs, and their families in Ghana.

### 3.3 Study Design

The study used a concurrent embedded mixed method design using both quantitative and qualitative data collection methods. The quantitative component, however, was the dominant approach where some participants selected for the quantitative component were also interviewed for the qualitative component. In this type of study, both the quantitative and qualitative data collected simultaneously during the data collection period. The choice of this design was informed by previous research which reveals that embedding permits diverse research questions to be addressed using either approach (Creswell, 2009). The reason for using mixed methods is to provide the researcher with an opportunity to better understand the research problem. The mixed helped in combining the objective measurement using questionnaire to determine factors

associated with mood altering substances with detailed description of the experiences of the youth with substance use disorders (SUDs) at the drug rehabilitation centres, and their families' using in-depth interviews. This aided the generation of in-depth data to appreciate issues from varying perspectives which could have been missed if data were drawn from only one approach.

### 3.3.1 Study Design for Quantitative

The quantitative component consisted of a matched case-control design. The case-control study design was used to investigate the risk factors associated with substances use disorders among the youth in four rehabilitation centres and selected communities in Ghana. Cases were enrolled from four drug rehabilitation centres in Ghana, namely Compassion rehabilitation, Pantang Drug Treatment Centre, House of St Francis, Ashaiman, and Remar Drug Rehabilitation Centre. Three of the rehabilitation centres were all-males facilities except Pantang, which admits both males and females. Pantang Drug Rehabilition centre is also the only public facility in this study. These were the main four drug rehabilitation centres in Ghana available during the time of study. Controls were persons aged 15 to 35 years living in the same community as the cases but have never used substance.

### 3.3.2 Study Design for Qualitative Component

The qualitative component of this study used the descriptive phenomenological approach to explore the experiences of youth who are residents at the drug rehabilitation centers for SUDs and their families. Phenomenological approach is a form of qualitative enquiry that emphasizes experimental, lived aspects of people (Knoblauch, 2001). This research approach was selected for this study because it is suitable when exploring the lived or subjective experiences of people with a particular phenomenon in a defined context (Polit & Beck, 2012). Thus, the lived experiences of

youth who are residents at the drug rehabilitation centres could not be adequately studied by quantitative methods alone. Phenomenological studies do not only seek for the causes of certain incidents, rather they are mostly aimed at understanding the lived experiences of people through the various acts of consciousness.

### 3.4 Study Area

The research was conducted in four (4) rehabilitation centres in the Greater Accra, and Eastern Regions of Ghana as follows:

**Compassion Rehabilitation** – It is a Christian faith-based rehabilitation centre located in Prampram, of the Ningo-Prampram district and has treated over two hundred persons with SUDs since its establishment in 2013. **Pantang Drug treatment Centre** is located within the Pantang Psychiatric Hospital in the Ga East Municipal Assembly. The facility admits both males and females with SUD. **House of St Francis, Ashaiman** was established by the Catholic church and is located at the Ashaiman Municipal Assembly. The above three drug rehabilitation centres are all in the Greater Accra Region, while **Remar Drug Rehabilitation Centre** is located in Pakro in Adoagyiri-Nsawam Municipal Assembly in the Eastern Region. It is a faith-based rehabilitation Centre and operates as a non-governmental Organization (NGO).

### 3.5 Study Population

#### 3.5.1 Cases

The target population for this study were males and females with substance use disorders aged 15 to 35 years who were resident at the four rehabilitation centres. Table 3.1 shows the total

population (159) of persons with SUDs aged 15 to 35 years who were resident at the four rehabilitation centres at the time of data collection.

**Table 3.1: The population of cases of each drug rehabilitation center**

| Drug Rehabilitation Centers | Population of cases |
|---|---|
| Compassion | 51 |
| Pantang | 46 |
| Remar | 35 |
| House of St Francis | 27 |
| Total | 159 |

### 3.5.2 Control

Males and females aged 15 to 35 years living in the same community as the cases but have never used substance.

## 3.6 Criteria for Selection

### 3.6.1 Inclusion Criteria

All youths aged 15 to 35 years who had completed a minimum of a continuous six (6) months of drug rehabilitation at the four rehabilitation centres were included in the study. Youths at the selected rehabilitation centres who granted informed consent or were willing to participate were included in the study.

### 3.6.2 Exclusion Criteria

i. Youths at the selected rehabilitation centres who were ill and requiring medical attention at the time of the study.

ii. Youth at the selected rehabilitation centres who could not communicate because of mental impairment were excluded from the study.

## 3.7 Sample Size Calculation

### 3.7.1 Sample Size Calculation for Quantitative Study

The minimum sample size for the study was determined using the formula below.

$$n = \left(\frac{r+1}{r}\right)\frac{\bar{p}(1-\bar{p})(Z_{1-\beta} + Z_{1-\alpha/2})^2}{(p_1 - p_2)^2}$$

Where n = sample size for case group

$\alpha$ = significance level = 5%

$$Power = 1 - \beta = 80\%$$

$$Z_{1-\beta} = 0.845$$

$Z_{1-\alpha/2}$ = z-score for population distribution at 95% confidence interval =1.96

$r$ = ratio of control to cases = 3:1

$\bar{p}$ = average proportion exposed = (proportion of exposed cases + proportion of controls exposed)/2

$p_1 - p_2$ = = Effect size or different in proportion expected based on previous studies, $p_1$ is proportion in cases, and $p_2$ is proportion in controls

$p_1 = 50.0\%$ is the proportion of non-drug addict at the community of the cases and $p_2$ is the proportion of cases (drug addict at the rehabilitation centres).

Assuming $OR = 2.0$ based on practical significance, $p_2 = \frac{p_1(OR)}{1+p_1(OR-1)} = 0.6667$.

$$\overline{p} = \frac{p_1 + p_2}{2} = \frac{0.50 + 0.6667}{2} = 0.5833$$

The sample size formula was calculated as;

$$n = \left(\frac{3+1}{3}\right)\frac{(0.5833)(1-0.5833)(0.845+1.96)^2}{(0.50-0.6667)^2}$$

$$n = 91.79363 \approx 92$$

Assuming a non-response rate of 10%, the total number of cases required is 92 + (0.10 × 92) = 101. Therefore, the required number of cases is 101 corresponding to 303 controls. Hence, the total sample size of 404 youths was recruited for the study.

### 3.7.2 Sample Size Calculation for the Qualitative Study

The sample size for the qualitative study was not predetermined. This was based on the point at which the researcher reached saturation of the data, consistent with qualitative research approach (Polit & Beck, 2012). For the focus group discussion, there were four group discussions, each consisting of eight youth residents in the four rehabilitation facilities were engaged. For the in-depth interview, twenty-one youth residents in the four rehabilitation facilities were involved: seven from Compassion, five from Pantang, five from Remar, and four from House of St Francis.

This was the point at which saturation was attained in each of the facilities before the data was merged.

### 3.8 Sampling Technique

#### 3.8.1 Sampling Technique for Quantitative Study

All residents at the four rehabilitation centres who met the inclusion criteria were eligible for inclusion in the study. The total number of cases were selected for the study using a sample that was proportionate to size of admitted persons in the respective four rehabilitation centres. This included the female proportion, which was selected from Pantang Drug Rehabilitation Centre. Proportionate sampling was used to allocate an equal proportion of youth with SUDs to the four selected rehabilitation centres. For proportionate sampling, the researcher divided the number of cases into the four rehabilitation centres (strata) and then applied systematic sampling methods to each stratum (Schoereder *et al.*, 2004). Table 3.2 shows the number of cases sampled from each drug rehabilitation centre. Within each centre, systematic sampling method was used to sample the youth with SUD. The systematic sampling allowed the population to be sampled at a set interval called the sampling interval. Sampling interval (k) for each rehabilitation centre was determined by dividing the number of units in the population by the desired sample size. That is, $k = \frac{N}{n}$. Thus, from Table 3.2, every other 1 drug addict resident in the drug rehabilitation register arranged in alphabetical order in each of the drug rehabilitation centres was selected as a participant.

**Table 3.2: The number of cases sampled from each drug rehabilitation center**

| Drug Rehabilitation Centers | Population of cases | Sample of cases | k |
|---|---|---|---|
| Compassion | 51 | 32 | $0.6 \approx 1$ |
| Pantang | 46 | 29 | $0.6 \approx 1$ |
| Remar | 35 | 22 | $0.6 \approx 1$ |
| House of St Francis | 27 | 17 | $0.6 \approx 1$ |
| Total | 159 | 101 | |

Three neighborhood controls were randomly selected for each case interviewed. Based on the house address of cases interviewed, the researcher followed up to the communities where cases came from to select controls. In the absence of a proper reference point (street address, post code etc), the controls were selected for each case by the researcher standing in front of the house of the case and spun a bottle to determine a starting direction. Upon reaching a house, only one person aged 15 to 35 years who consented to participate was interviewed. In a house where there are two or more eligible participants, fair balloting was done to select only one person aged 15 to 35 years from that household. The selection was also gender specific. Meaning that where a case was a female, three females were selected as controls.

### 3.8.2 Sampling Technique for Qualitative Study

In terms of sampling, purposive sampling method were used to recruit the participants for the qualitative study. Purposive sampling method is a form of non-probability sampling in which researchers depend on their own judgement when selecting members of the population to participate in their surveys. It permits the researcher to choose participants based on judgements

about the population to be included in the study (Polit & Beck, 2012; Walter, 2010). In this study, this method was employed to recruit participants based on their experiences with mood-altering substances. For recruitment of participants, permission was obtained from the four drug rehabilitation centers, after obtaining ethical clearance from the Ethical Review Committee of the Ghana Health Service. The Principal Investigator (PI) and Research Assistants (RAs) engaged the rehabilitation attendants. This was followed by the screening of the people at the various drug rehabilitation centers using the inclusion criteria that was set. Those who qualified to be part of the study and agreed to participate were then taken through the consent procedure.

### 3.9 Study Variables for Quantitative Study

The variables used in this study comprised of a dependent variable and explanatory variables. The dependent variable of interest was substance use disorders. Substance use disorders used in the study is the mental disorder due to the use of illegal or legal substances such as drugs or alcohol.

**Table 3.3: Summary of Variables Used in the Quantitative Study**

| Variable Type | Operationalization | Scale of Measurement |
|---|---|---|
| **Dependent Variable** | | |
| Substance Use Disorders | No, Yes | Binary |
| **Independent Variable** | | |
| **Socio-demographic** | **Characteristics** | |
| Age | Age at last birthday in years | Continuous |
| Sex | Male, Female | Binary |
| The highest level of education | No Formal Education, Basic (Primary, JHS/JSS), Secondary (SHS/SSS/Technical/Vocational), Tertiary | Nominal |
| Employment Status | Unemployed, Employed | Binary |
| Marital Status | Single, Cohabiting, Divorced, Widow, Married | Nominal |
| Religious Affiliation | No religion, Christianity, Islam | Nominal |
| Number of Children | Number of children given birth to. | Discrete |
| Family Size | Number of family members in the house | Discrete |
| Current Residence | Rural, Urban | Binary |

**Table 3.3: Summary of Variables Used in the Study (Con't)**

| Variable Type | Operationalization | Scale of Measurement |
|---|---|---|
| Frequency of Participation in religious activities | once a week or more, once a month or more but less than once a week, several times but less than once a month, did not attend /participate in any. | Ordinal |
| Source of income within past 30 days | salary/wage from legitimate job, public assistance/ charity, spouse/family, friends. | Nominal |
| **Household** | **Characteristics** | |
| Person lived with until age 15 | both parents, mother only, father only, grandparent/ other relatives. | Nominal |
| Person currently living with | both parents, mother only, father only, grandparent/ other relatives, friends, alone, partner. | Nominal |
| Life status of father | Dead, alive | Binary |
| Father's educational level | None, basic(primary/JHS), secondary, tertiary. | Ordinal |
| Life status of mother | Dead, alive | Binary |
| Mother's educational level | None, basic(primary/JHS), secondary, tertiary. | Nominal |
| Parents' economic status | Poor, middle income, rich | Ordinal |
| Residency in past 12 months | Rural, urban | Binary |
| **Social and** | **Environmental Characteristics** | |
| Control over when and where you go at night | Yes, No | Binary |
| Control over what friends you keep | Yes, No | Binary |
| Control over whether or not you use drugs | Yes, No | Binary |
| **Social and** | **Environmental Characteristics** | |
| Control over whether or not you go to work or school | Yes, No | Binary |
| Control over whether or not you drink alcoholic beverages | Yes, No | Binary |
| Control over how you spend your money | Yes, No | Binary |
| Strictness of guardian | Normal, not strict, extremely strict | Ordinal |
| Relationship with parents | Good, warm, confronting | Nominal |
| Strength of family ties | Strong, moderate, weak | Ordinal |
| Any family member who uses drugs | Yes, No | Binary |
| Any friend who uses drugs | Yes, No | Binary |
| Any area in the vicinity where hard drugs are traded | Yes, No | Binary |

### 3.10 Data Collection Methods and Tools

Data collection for the study occurred between December 2018 and February 2019.

#### 3.10.1 Quantitative data collection methods and tools

The quantitative data was collected using closed-ended questionnaires that solicited information on socio-demographic characteristics, household characteristics, social and environmental factors, and economic burden-related questions. The questionnaire was interviewer-administered. The PI and the RAs explained the questions and responses to the respondents. Adopting the face-to-face method permitted for checking the responses for completeness before ending each session. Bowling (2014) stated that the face-to-face method help to enhance the response rate and avoid the high non-response rate related to the self-administered questionnaires. The questionnaire administration lasted between 20- 25 minutes.

Section A of the questionnaire obtained data on the socio-demographic characteristics of study participants which comprise sex, age, educational level, status, marital status, employment status, religion, participation in religious activities, residency in past 12 months, current residency, and number of children.

Section B of the questionnaire obtained data on life status of father and mother, educational status of father and mother, parents' economic person lived with at age 15, person currently living with, family size.

Section C obtained data on social and environmental factors of the study participants which comprises control over when and where to go at night, control over what friends to keep, control over whether or not to use drugs, control over whether or not to work or school, control over

whether or not to drink alcoholic beverages, control over how to spend money, strictness of guardian, relationship with parents, strength of family ties, any family member uses drugs, and any area in the vicinity where hard drugs are traded.

Section D obtained data on economic burden of the study participants which comprises direct and indirect cost of drug rehabilitation. The direct cost of drug rehabilitation consisted of medical and the non-medical cost as well as intangible costs. Direct medical cost comprised registration, consultation, laboratory & diagnostic test, medicines/drugs and cost of specific tool (Recovery Centres of America, 2020). Direct non-medical cost comprised transportation, food, drinks, water and other direct expenses (phone calls).

A report by the Ghana National Daily Wage, National Tripartite Committee in 2020, with regard to indirect cost estimation, stated that, the human capital approach was used with a daily minimum wage of GHS 11.82. The indirect cost comprises days lost at work, productivity loss due to travelling, productivity loss due to waiting time and days lost by relative by taking care of patient were considered. Days lost at work by patient was defined by adding all working days lost by employed patients during the period of diagnosis and treatment. Productivity loss due to travelling was obtained by the aggregation of hours lost by patient and accompanying relatives due to travelling to and from treatment centers. Lastly, productivity loss due to waiting time was obtained by summing of all hours spent waiting to be seen by a doctor/service provider. The total indirect cost was calculated as the overall total losses of the patient and accompanying relative.

Section E obtained data on economic burden of the family member of the study participants which comprise of intangible cost of drug rehabilitation. Intangible cost was estimated using the Zarit burden interview scale. The scale was developed as a uni-dimensional measure of burden and comprised 22 items rated on a 5-point Likert scale; ranging from 0 (never) to 4 (nearly always) with total scores ranging between 0–88. Higher scores indicate greater burden, thus a score of 17 or more was considered high burden (Bedard *et al*., 2001).

#### 3.10.1.1 Compliance of drug rehabilitation in Ghana to UNODC Guidelines

The United Nations Office on Drugs and Crime guideline (UNODC, 2012) was filled by the directors of the four rehabilitation centres. Quality indicator for rehabilitation allowed the drug rehabilitation facilities to define what is important when it comes to quality of care and what must be done to maintain it (Casalino, 2000). To determine quality of rehabilitation services per United Nations Office on Drugs and Crime (UNODC) guideline, the TREATNET quality standards for drug dependence treatment and care services questionnaire (UNODC, 2012) was adopted and used to assess the standard of selected rehabilitation facilities. The tool has nine domains with several items under each domain. These domains are availability and accessibility of drug dependence treatment, screening, assessment, diagnosis and treatment planning, evidence-based drug dependence treatment, human rights and the dignity of the patient/client, targeting special subgroups and conditions, drug dependence treatment as an alternative to prison and in prison settings, community-based treatment, clinical governance, policy development, strategic planning and coordination of services. The tool is an internationally agreed tool to assess quality of care for persons with drug related health problems in psychiatric and social care facilities (UNODC, 2012). The items were scored using 5-point Likert scale (5-Adequately met, 4-Inadequately met, 3- Not met at all, 2- Not applicable and 1- Available on referral). Domain questions with "Not applicable"

responses were excluded from analysis. This was recoded as 3 -adequately met, 2- inadequately met, 1- available on referral, and 0- not met at all.

### 3.10.2 Qualitative data collection methods and tools

The qualitative data was collected from youths with SUDs receiving treatment at the four drug rehabilitation centres and their families using in-depth interviews (IDI) and focus group discussion (FGD).

#### 3.10.2.1 In-Depth Interviews (IDI)

Face-to-face in-depth interviews were conducted with the 21 youths and their family members who were recruited for the qualitative study. The IDI was conducted with seven youths and their family members from Compassion, five youths and their family members from Pantang, five youths and their family members from Remar and four youths and their family members from House of St Francis. The information collected from participants comprised the experiences of the youth in rehabilitation for addiction to mood-altering substances, and their families in Ghana. The Compassion rehabilitation centre was the first facility where qualitative data collection began. The PI started by establishing rapport with the management of the rehabilitation centres as well as the residents, the essence of which was to build trust. Participants were assured of anonymity and confidentiality by indicating that their information will remain with the researcher and the research team and only be used for research purposes only. They were also assured of anonymity concerning the voice recording. The interviews were conducted in a small well-ventilated room devoid of external noise within the facility. After establishing rapport, the investigator assisted each participant to go through the consent procedure. Information sheet was read to the participants and they were permitted to ask questions and answers were provided. The researcher explained that

refusal to partake in the study was not going to affect their treatment at the facility. They were also told to make a decision to either to participate in the study or not. Participants' consents were also obtained for the interviews to be audiotaped.

Each interview started with the gathering of information on the socio-demographic characteristics of each participant. This was followed by open-ended questions on experiences of the youths in rehabilitation for addiction to mood-altering substances in Ghana. The interview sessions were extensive and probing. It was conducted in a relaxed and simple manner as in a conversation, to ensure clarity and precision and was also non-judgmental. The participants were given enough time to narrate their experiences at the rehabilitation centres, their lived experiences with substance use disorders, and how it affected their families. The researcher could speak English, Ewe, Twi and Ga. However, other youth who spoke other languages like Hausa had their interviews conducted by research assistants with experience in conducting research in Hausa.

Each in-depth interview lasted 30 – 45 minutes. The in-depth interview guide (see appendix 3) was developed and used for the interviews. The interview guide consisted of two sections. The first session of the interview guide emphasized on participant's socio-demographic and family information including age, educational level, marital status, religion, sex and age of family member, relationship with family member. The second section focused on the experiences of the participants at the rehabilitation centres.

The IDI guide which was originally designed in English was translated into the preferred language of the participant (Twi, Ga, Ewe, Hausa) using a back-to-back approach by any of the research assistants who are proficient in any of the languages and are language experts from the University

of Ghana. The versions were compared for similarities and differences, and the necessary modifications were made. This allowed for consistency in the data collection tool.

#### 3.10.2.2 Focus Group Discussion

Four groups, each consisting of eight youth residents in the four rehabilitation facilities were engaged in the focus group discussion for the qualitative study. Residents who have gone through at least six months of rehabilitation were considered for the FGD. Lindlof and Taylor (2002) opined that focus group is a stand-alone data collection instrument because it has a rippling effect in collecting data from other respondents who under normal circumstances would not contribute to discussions on a phenomenon. In line with Lindlof and Taylor's (2002) opinion, all the focus group discussions collectively offered rich in-depth data.

Prior to the focus group discussions, a discussion guide was designed to comprise simple self-explanatory open-ended focal topics (see Appendix 3). The guide helped to increase the face validity of data gathered by directing the participants to provide valuable but diverse perspectives on their experiences with mood-altering substance use. Four different focus groups comprising of eight youths in rehabilitation for addiction to mood-altering substances in Ghana were selected after their consent was sought and the purpose of the meeting was explained. Each discussion lasted between 30 and 40 minutes.

### 3.11 Quality Control Measure

Data was collected with the help of Research Assistants, under close supervision. Data was cross-checked for validity and scrutinized to ensure that it makes logical meaning. The questionnaire was coded with numbers to avoid repetition. After data were entered, data on the questionnaire

was compared to data entered to ensure that valid information was entered.

### 3.11.1 Training of Research Assistants

The Research Assistants were trained before the study to aid in the data collection process. The training entailed a detailed explanation of the questionnaire, ethical guidelines of the study, and seeking informed consent from the study participants. The content of the questionnaire was well explained to the Research Assistants to prevent interviewer bias.

### 3.11.2 Pre-Testing and Review of Data Collection Instrument

A pilot study was conducted with the final draft of the questionnaire, which was drafted with the help of experts from the School of Public Health, University of Ghana. It was carried out among 15 SUDs residents at the House of St Francis Drug Rehabilitation Centre in Ashaiman. The questionnaire was then assessed for reliability and validity, and the content was reviewed to produce the final questionnaire. Finally, problems encountered in the data collection process were noted and addressed before the actual data collection.

## 3.12 Data Management and Analysis

### 3.12.1 Quantitative Data Management and Analysis

The quantitative data collected for the study were screened, checked for completeness, and coded, where necessary and entered into STATA version 15 for data analysis. Data cleaning was done by fixing or removing incorrect, incomplete, or duplicate data in the dataset. After data entry, the data set was cross-checked with hard copies to ensure that every variable was appropriately defined. Ten percent of the questionnaires were randomly sampled and rechecked. The descriptive statistics

of the study participants (cases/controls) were used to summarize the distribution of selected socio-demographic characteristics, social and environmental factors, and economic burden. Categorized variables were summarized using frequencies with related percentages, while continuous variables were summarized using mean, with their related standard deviations or median with related interquartile range if the variable violates normality assumptions. Normality test of continuous variables were assessed using Shapiro-Wilk test. Pie chart was used to show the proportion of the cost profile of the drug rehabilitation while bar chart was used to show the intangible burden of patients. The independent variables were screened using area under the receiver operating characteristic curve (AUROC).

The main outcome variable was substance use disorders (no, yes). Bivariate analysis and multivariable logistic regression were fitted to determine the association between the dependent variable (SUDs) independent variables (socio-demographic characteristics, household characteristics, and social and environmental factors). For bivariate analysis, the Chi-square test (Pearson or Fisher exact test) was used to test the association for cross-tabulation and to establish how proportions of the various independent variables compared between the categories of the outcome variable (SUDs). The statistical relationship between SUDs and the sociodemographic characteristics, household characteristics, and social and environmental factors were declared significant at a p-value of $< 0.05$ using Pearson Chi-square or Fisher Exact test. Since bivariate analysis does not consider confounding effects, a multivariable conditional logistic regression model was fitted to determine whether the socio-demographic characteristics, household characteristics, and social and environmental factors are associated with SUDs. Independent variable of the p-value of $< 0.20$ in the univariate logistic regression model were included in the

multiple logistic regression model. The statistical relationship between SUDs and the socio-demographic characteristics, household characteristics, and the social and environmental factors was declared significant in the multivariable logistic regression at p-value < 0.05.

#### 3.12.1.1 Compliance of Drug rehab in Ghana to UNODC Guidelines

Compliance of drug rehabilitation facilities in Ghana to the UNODC guideline was measured using mean scores with the associated standard deviation, which were generated from responses to UNODC Likert scale questions. These means were then compared to UNODC standard thresholds to assess compliance. Nine domains from the UNODC questionnaire on drug rehabilitation compliance were assessed.

#### 3.12.1.2 Economic Cost Associated with drug rehabilitation

***Direct cost estimation***

All direct costs incurred by patients for medical and non-medical cost of treatment in a month was summed and divided by the total number of participants that incurred this cost. The differences in the average direct cost of treatment among some socio-demographic characteristics of participants were tested using either independent t-test or Wilcoxon rank-sum test and one-way ANOVA or Kruskal Wallis test.

The independent t-test and one-way ANOVA were used to compare the mean of the average direct cost of treatment among the socio-demographic characteristics of study participants when the average direct cost of treatment is normally distributed while the Wilcoxon sum-rank test or Kruskal Wallis test were used to compare the median of the average direct cost of treatment among

the socio-demographic characteristics of study participants when the average direct cost of treatment violates the normality assumptions.

***Indirect cost estimation***

With regards to indirect cost estimation, the human capital approach was used with a daily minimum wage of GHS 11.82. The indirect costs comprise days lost at work, productivity loss due to travelling, productivity loss due to waiting time and days lost by relative by taking care of patient were considered. Days lost at work by patient was defined by adding all working days lost by employed patients during the period of diagnosis and treatment. Productivity loss due to travelling was obtained by the aggregation of hours lost by patient and accompanying relatives due to travelling to and from treatment centres. Lastly, productivity loss due to waiting time was obtained by summing of all hours spent waiting to be seen by a doctor/service provider for SUD. The total indirect cost was calculated as the overall total losses of the patient and accompanying relative. In determining the average indirect cost, the total sum was divided by the number of respondents. The differences in the average indirect cost of treatment among some socio-demographic characteristics of participants were tested using either independent t-test or Wilcoxon rank-sum test and one-way ANOVA or Kruskal Wallis test.

The independent t-test and one-way ANOVA were used to compare the mean of the average indirect cost of treatment among the socio-demographic characteristics of study participants when the average indirect cost of treatment is normally distributed while the Wilcoxon sum-rank test or Kruskal Wallis test were used to compare the median of the average indirect cost of treatment among the socio-demographic characteristics of study participants when the average indirect cost of treatment violates the normality assumptions.

***Intangible cost estimation***

The intangible cost was categorized into a dichotomous variable. The cut-off for the overall intangible cost was derived from the mid-range of the total score 17. An overall intangible cost score less than or equal to 17 was considered as low burden and an overall score higher than 17 was considered as high burden (Bedard *et al*., 2001).

Bivariate analysis was fitted to determine the association between the socio-demographic characteristics and intangible burden. For bivariate analysis, the Chi-square test (Pearson or Fisher exact test) was used to test the association for cross-tabulation and to establish how proportions of the various independent variables compared between the categories of intangible burden. The statistical relationship between the intangible burden and the sociodemographic characteristics were declared significant at a p-value of $< 0.05$ using Pearson Chi-square or Fisher Exact test.

***Sensitivity analysis***

Sensitivity analyses were conducted to assess the validity of estimated costs. Cost of key variables such as wage and medicines/drugs were subjected to variation to see if they had any significant effect on the results, total direct, and total indirect cost estimates. The singular and multi-variation sensitivity analyses (SA) were conducted by changing the cost estimates in the wage using the 2020 daily minimum wage of GHS 11.82. These key variables were identified and included in the sensitivity analyses due to the uncertainty associated with them. Variation at 3%, 5% and 7% increments in cost components were considered for the corresponding changes in the total cost calculated. The analyses took into consideration uncertainties associated with errors. Measurement errors of cost components, interviewer bias and recall bias were key errors considered.

### 3.12.2 Qualitative Data Analysis

In-depth Interviews (IDIs) and Focus Group Discussions (FGDs) data was transcribed verbatim in English. The Haase's adaptation of Colaizzi's method was used to analyze transcripts (Morrow *et al*., 2015; Sanders, 2003). This method involved, reading the transcript several times to gain understanding of meanings conveyed, identifying significant phrases and restating them in general terms, formulating meanings, and validating meanings through discussion.

This was followed by a thematic analysis of the transcripts to identify emerging themes. Themes were identified and organized into clusters and categories, and developing a full description of themes. All FGD and IDI transcripts were loaded into NVIVO Version 10. A coding framework was formulated based on the guide used for the interviews and discussions. Using the framework, all files were coded. Queries were run to summarize themes under appropriate sub-headings. A codebook was developed for the themes, and the themes were augmented with field notes of the interviews. Appropriate quotations were selected to support the themes. The FGDs and IDIs were synthesized to complement each other. Narratives were supported with appropriate quotations from the interviews. The results were presented in summarized themes and quotations. Two Research Assistants analyzed the transcripts independently by bracketing data on preconceived ideas and strictly following the adapted Colaizzi's method described above. Findings were then compared and discussed until consensus on themes, theme clusters, and categories was achieved.

### 3.13 Ethical considerations

**Ethical Clearance and informed consent:** Ethical approval was obtained from the Ethics Review Committee of the Ghana Health Service. The ethical clearance number was "**GHS-ERC:**

**013/06/18".** Permission was obtained from the Adoagyiri-Nsawam Municipal Assembly, Ga East Municipal Assembly, Ashiaman District, and Ningo-Prampram Municipal Assembly where the study was conducted. Informed consent was obtained from study participants. Study participants were informed about the purpose, procedures, risks and benefits of participating in the study. The participants were informed of possible minor discomforts in answering certain questions for which they might choose not to answer.

For participants who could not read, the consent forms were read and explained to them in the presence of independent witnesses. In the light of this, participants who did not understand language used in the interview stood the risk of divulging sensitive information in the presence of interpreters used. This risk of divulging sensitive information was addressed by allowing respondents to choose their confidants as interpreters. Only participants who agreed to be part of the study were recruited for the study and required to sign the consent forms as an indication of their willingness to participate. Participants were, however, informed that there were no penalties, like loss of care to them if they chose to withdraw from the study. Participants were informed that even though there might not be direct benefit to them, information they provided would feed into a pool of data, which when analyzed would appropriately contribute to policies and strategies on rehabilitation and care for people with drug use disorders. They were also made to understand that there would be no compensation for being part of the study. Participants were informed that participation in the study was voluntary and they could withdraw from the study at any time without attracting any penalty. Participants were not coerced into taking part in the study.

**Anonymity Data Protection and Storage:** Confidentiality/privacy assured before their engagement in the study, thus participants were identified with codes and numbers instead of their actual names during and after data collection, analysis and reporting. The interviews were held in

a separate room assigned to the research team. Data collected for the study was kept confidential and used solely for the purpose indicated for the study. Questionnaires were kept safe under lock and key to prevent access by persons who were not in the research team. Also, data was locked with restricted access on a secure laptop which can only be accessed by the principal investigator and direct supervisors.

# CHAPTER FOUR

# RESULTS

## 4.1 Socio-demographic characteristics of participants

A total of 404 youths (101 cases and 303 matched controls based on sex and area of residence) from all four rehabilitation centers were involved in this study. The response rate of those invited to participate was 100%. Table 4.1 shows the socio-demographic characteristics of participants. The majority of the participants (77.5%) were males. More than one-third (34.2%) of the participants were aged 20-24 years; 33.7% of the cases belonged to the 25-29 years age group while 37.0% of the controls belonged to the 20-24 years age group.

More than one-third of the participants (46.0%) had completed secondary school education; 42.6% of the cases compared to 47.2% of the controls had completed secondary school. More than three-fourths (77.5%) of the participants are employed; 82.2% of the cases and 75.9% of the controls are employed. More than two-thirds (69.8%) of the participants are single; 68.3% of the cases and 70.3% of the controls are single.

More than two-thirds (67.6%) of the participants had no child; 65.3% of the cases and 68.3% of the controls had no child. Most of the participants (61.1%) had a source of income within the past 30 days from salary/wage derived from legitimate job; 66.3% of the cases and 59.4% of the controls had a source of income within the past 30 days from salary/wage derived from the legitimate job.

**Table 4.1: Socio-demographic characteristics of study participants**

| Characteristics | Control (n=303) Frequency (%) | Cases (n =101) Frequency (%) | Total (n=404) Frequency (%) |
|---|---|---|---|
| **Sex** | | | |
| Female | 69 (22.8) | 23 (22.8) | 91 (22.5) |
| Male | 234 (77.2) | 78 (77.2) | 313 (77.5) |
| **Age** | | | |
| 15-19 years | 76 (25.0) | 22 (21.8) | 98 (24.3) |
| 20-24 years | 112 (37.0) | 26 (25.7) | 138 (34.2) |
| 25-29 years | 76 (25.1) | 34 (33.7) | 110 (27.2) |
| 30+ years | 39 (12.9) | 19 (18.8) | 58 (14.3) |
| **Highest Educational level** | | | |
| None | 7 (2.3) | 5 (4.9) | 12 (3.0) |
| Basic (primary/JHS) | 46 (15.2) | 14 (13.9) | 60 (14.9) |
| Secondary | 143 (47.2) | 43 (42.6) | 186 (46.0) |
| Tertiary | 107 (35.3) | 39 (38.6) | 146 (36.1) |
| **Employment status** | | | |
| Unemployed | 73 (24.1) | 18 (17.8) | 91 (22.5) |
| Employed | 230 (75.9) | 83 (82.2) | 313 (77.5) |
| **Marital status** | | | |
| Single | 213 (70.3) | 69 (68.3) | 282 (69.8) |
| Cohabiting | 24 (7.9) | 5 (5.0) | 29 (7.2) |
| Married | 55 (18.2) | 20 (19.8) | 75 (18.6) |
| Divorced | 11 (3.6) | 7 (6.9) | 18 (4.4) |
| **Number of children** | | | |
| None | 207 (68.3) | 66 (65.3) | 272 (67.6) |
| 1-2 | 80 (26.4) | 24 (23.8) | 104 (25.7) |
| 3-4 | 10 (3.3) | 10 (9.9) | 20 (5.0) |
| 5 and above | 6 (2.0) | 1 (1.0) | 7 (1.7) |
| **Source of income within past 30 days** | | | |
| Salary/wage from legitimate job | 180 (59.4) | 67 (66.3) | 247 (61.1) |
| Public assistance/charity | 6 (2.0) | 1 (1.0) | 7 (1.7) |
| Spouse/family | 117 (38.6) | 31 (30.7) | 148 (36.6) |
| Friends | 0 (0.0) | 2 (2.0) | 2 (0.5) |
| **Religious affiliation** | | | |
| None | 2 (0.7) | 0 (0.0) | 2 (0.5) |
| Christianity | 269 (88.8) | 86 (85.1) | 355 (87.9) |
| Islam | 32 (10.5) | 15 (14.9) | 47 (11.6) |
| **Frequency of participation in religious activities** | | | |
| once a week or more | 193 (63.7) | 60 (59.4) | 253 (62.6) |
| once a month or more but less than once a week | 47 (15.5) | 14 (13.9) | 61 (15.1) |
| several times but less than once a month | 26 (8.6) | 11 (10.9) | 37 (9.2) |
| did not attend /participate in any | 37 (12.2) | 16 (15.8) | 53 (13.1) |
| **Residency in past 12 months** | | | |
| Rural | 17 (5.6) | 6 (5.9) | 23 (5.7) |
| Urban | 286 (94.4) | 95 (94.1) | 381 (94.3) |
| **Current residence** | | | |
| Rural | 30 (9.9) | 10 (9.9) | 40 (9.1) |
| Urban | 273 (90.1) | 91 (90.1) | 364 (90.1) |

The majority of the participants (87.9%) are Christians; 85.1% of the cases and 88.8% of the controls are Christians. More than half (62.6%) of the participants participated in religious activities once a week or more; 59.4% of the cases and 63.7% of the controls participated in religious activities once a week or more. The majority of the participants (94.3%) lived in the urban area in the past 12 months; 94.1% of the cases and 94.4% of the controls lived in the urban areas in the past 12 months. Finally, the majority of the participants (90.1%) are urban dwellers.

### 4.2 Household characteristics of study participants

Table 4.2 shows the household characteristics of participants. From Table 4.2, more than three-quarters of the participants (78.0%) had a household size ranging between five and nine persons; 72.3% of the cases and 79.9% of the controls had a household size ranging between five and nine persons. Eight out of ten of the participants lived with both parents until age 15; 77.2% of the cases and 81.2% of the controls lived with both parents until age 15. More than one-third (38.4%) of the participants are currently living with both parents; 33.7% of the cases and 39.9% of the controls are currently living with both parents. More than three-fourths (76.0%) of the participants had fathers being alive. The proportion of cases and controls whose fathers were alive was 76.2% and 75.9% respectively. More than one-third (36.6%) of the participants had their fathers completing tertiary education; 32.7% of the cases and 38.3% of the controls had their fathers completing tertiary education. The majority of the participants 87.9% had mothers being alive. The proportion of cases and controls whose mothers were alive were 84.2% and 89.1% respectively. More than one-third (35.9%) of the participants' mothers had completed basic school; 32.7% of the cases and 37.0% of the controls' mothers had completed tertiary education.

**Table 4.2: Household characteristics of study participants**

| Characteristics | Control (n=303) Frequency (%) | Cases (n =101) Frequency (%) | Total (n=404) Frequency (%) |
|---|---|---|---|
| **Household Size** | | | |
| < 5 | 31 (10.2) | 13 (12.9) | 44 (10.9) |
| 5-9 | 242 (79.9) | 73 (72.3) | 315 (78.0) |
| 10 and above | 30 (9.9) | 15 (14.8) | 45 (11.1) |
| **The person lived with until age 15** | | | |
| Both parents | 246 (81.2) | 78 (77.2) | 324 (80.2) |
| Mother only | 25 (8.2) | 7 (6.9) | 32 (7.9) |
| Father only | 6 (2.0) | 8 (7.9) | 14 (3.5) |
| Grandparent | 5 (1.6) | 3 (3.0) | 8 (2.0) |
| Other relatives | 15 (5.0) | 4 (4.0) | 19 (4.7) |
| Other | 6 (2.0) | 1 (1.0) | 7 (1.7) |
| **A person currently living with** | | | |
| Both parents | 121 (39.9) | 34 (33.7) | 155 (38.4) |
| Mother only | 24 (8.0) | 7 (6.9) | 31 (7.7) |
| Father only | 6 (2.0) | 1 (1.0) | 7 (1.7) |
| Grandparent/ other relatives | 20 (6.6) | 8 (7.9) | 28 (6.9) |
| Friends | 12 (4.0) | 2 (2.0) | 14 (3.5) |
| Alone | 66 (21.8) | 27 (26.7) | 93 (23.0) |
| Partner | 40 (13.2) | 15 (14.9) | 55 (13.6) |
| Other | 14 (4.6) | 7 (6.9) | 21 (5.2) |
| **Life status of the father** | | | |
| Dead | 73 (24.1) | 24 (23.8) | 97 (24.0) |
| Alive | 230 (75.9) | 77 (76.2) | 307 (76.0) |
| **Father's highest educational level** | | | |
| none | 23 (7.6) | 9 (8.9) | 32 (7.9) |
| Basic (primary/JHS) | 60 (19.8) | 28 (27.7) | 88 (21.8) |
| Secondary | 104 (34.3) | 31 (30.7) | 135 (33.4) |
| Tertiary | 116 (38.3) | 33 (32.7) | 149 (36.9) |
| **Life status of the mother** | | | |
| Dead | 33 (10.9) | 16 (15.8) | 49 (12.1) |
| Alive | 270 (89.1) | 85 (84.2) | 355 (87.9) |
| **Mother's highest educational level** | | | |
| None | 56 (18.5) | 26 (25.7) | 82 (20.3) |
| Basic(primary/JHS) | 112 (37.0) | 33 (32.7) | 145 (35.9) |
| Secondary | 72 (23.7) | 25 (24.8) | 97 (24.0) |
| Tertiary | 63 (20.8) | 17 (16.8) | 80 (19.8) |
| **Parents' economic status** | | | |
| Poor | 52 (17.2) | 17 (16.8) | 69 (17.1) |
| Middle income | 234 (77.2) | 79 (78.2) | 313 (77.5) |
| Rich | 17 (5.6) | 5 (5.0) | 22 (5.4) |

Note: JHS = Junior High School.

The majority of the participants (77.5%) had their parents belonging to the middle-income group; 78.2% of the cases and 77.2% of the controls had their parents belonging to the middle-income group.

### 4.3 Social and environmental characteristics of study participants

Table 4.3 shows the social and environmental characteristics of study participants. As indicated in Table 4.3, one-half (51.1%) of the participants had control over when and where they go out at night; 52.5% of the cases and 50.5% of the controls had control over when and where they go at night. One out of four of the participants had control over what friends they kept; 40.6% of the cases and 40.6% of the controls had control over what friends they kept. More than one-third (44.1%) of the participants had control over whether or not they use drugs; 42.6% of the cases and 44.5% of the participants had control over whether or not they use drugs. One-half (50.0%) of the participants had control over whether or not they go to work or school; 55.5% of the cases and 48.2% of the controls had control over whether or not they go to work or school.

Nearly half (45.5%) of the participants had control over whether or not they drink alcoholic beverages; 47.5% of the cases and 44.9% of the control had control over whether or not they drink alcoholic beverages. More than one-third (37.9%) of the participants had control over how they spent their money; 38.6% of the cases and 37.6% of the controls had control over how they spent their money. More than half (64.3%) of the participants don't have a strict guardian; 70.3% of the cases and 62.4% of the controls don't have a strict guardian. More than half (53.2%) of the participants have a warm relationship with parents; 58.4% of the cases and 51.5% of the controls have a warm relationship with parents. One-half (50.7%) of the participants had a moderate family strength tie. The proportion of cases and controls who had moderate family strength ties were 54.5% and 49.5% respectively.

**Table 4.3: Social and environmental characteristics of study participants**

| Characteristics | Control (n=303) Frequency (%) | Cases (n =101) Frequency (%) | Total (n=400) Frequency (%) |
|---|---|---|---|
| Control over when and where they go at night | 153 (50.5) | 53 (52.5) | 206 (51.1) |
| Control over what friends they keep | 123 (40.6) | 41 (40.6) | 164 (40.6) |
| Control over whether or not they use drugs | 135 (44.5) | 43 (42.6) | 178 (44.1) |
| Control over whether or not they go to work or school | 146 (48.2) | 56 (55.5) | 202 (50.0) |
| Control over whether or not they drink alcoholic beverages | 136 (44.9) | 48 (47.5) | 184 (45.5) |
| Control over how they spend money | 114 (37.6) | 39 (38.6) | 153 (37.9) |
| **Strictness of guardian** | | | |
| Normal | 57 (18.8) | 16 (15.8) | 73 (18.1) |
| Not strict | 189 (62.4) | 71 (70.3) | 260 (64.3) |
| Extremely strict | 57 (18.8) | 14 (13.9) | 71 (17.6) |
| **Relationship with parents** | | | |
| Good | 131 (43.2) | 35 (34.7) | 166 (41.1) |
| Warm | 156 (51.5) | 59 (58.4) | 215 (53.2) |
| Confronting | 16 (5.3) | 7 (6.9) | 23 (5.7) |
| **Strength of family ties** | | | |
| Strong | 144 (47.5) | 40 (39.6) | 184 (45.6) |
| Moderate | 150 (49.5) | 55 (54.5) | 205 (50.7) |
| Weak | 9 (3.0) | 6 (5.9) | 15 (3.7) |
| **Any family member who uses drugs** | | | |
| No | 160 (52.8) | 52 (51.5) | 212 (52.5) |
| Yes | 143 (47.2) | 49 (48.5) | 192 (47.5) |
| **Any friend who uses drugs** | | | |
| No | 106 (35.0) | 34 (33.7) | 140 (34.7) |
| Yes | 197 (65.0) | 67 (66.3) | 264 (65.3) |
| **Any area in the vicinity where hard drugs are traded** | | | |
| No | 134 (44.2) | 44 (43.6) | 178 (44.1) |
| Yes | 169 (55.8) | 57 (56.4) | 226 (55.9) |

More than one-third (47.5%) of the participants had family members who use drugs; 48.5% of the cases and 47.2% of the controls had family members who use drugs. More than half (65.3%)

of the participants had friends who use drugs; 66.3% of the cases and 65.0% of the controls had friends who use drugs. Finally, more than half (55.9%) of the participants had areas in their vicinity where hard drugs are traded; 56.4% of the cases, and 55.8% of the controls had areas in their vicinity where hard drugs are traded.

### 4.4 Relationship between socio-demographic characteristics and substance use disorders among study participants

Table 4.4 shows the relationship between socio-demographic factors and substance use disorders among study participants. Sex was significantly related to substance use disorders among study participants ($p<0.001$). That is, among the participants with substance use disorders, 77.2% were males compared to 22.8% who were females.

The age group of the participants was significantly related to substance use disorders among study participants ($p=0.007$). That is, substance use disorders were highest (33.7%) and lowest (18.8%) among participants with substance use disorders who belonged to the age group 25-29 years and 30+ years respectively.

The highest level of education of the study participants was significantly related to substance use disorders ($p=0.004$). That is, substance use disorders were highest (42.6%) and lowest (4.9%) among participants who had attained secondary school and no education respectively.

The employment status of study participants was significantly related to substance use disorders among study participants ($p=0.001$). That is, among participants with substance use disorders, 82.2% were employed compared to 17.8% who are unemployed.

The marital status of the study participants was significantly related to substance use disorders among study participants ($p<0.001$). That is, the development of substance use disorders was

highest (68.3%) and lowest (5.0%) among participants with substance use disorders who are single and cohabiting respectively.

The number of children of the study participants was significantly related to substance use disorders ($p<0.001$). That is, substance use disorders were highest (65.3%) and lowest (1.0%) among participants who had no child and 5 and above children respectively.

The current residence of the study participants was significantly related to substance use disorders ($p=0.023$). That is, among the participants with substance use disorders, 90.1% are currently residing in the urban areas compared to 9.9% residing in the rural residents.

Religious affiliation of study participants was significantly related to substance use disorders among study participants ($p=0.003$). That is, substance use disorders were highest (85.1%) and lowest (0.0%) among participants with substance use disorders who belonged to the Christianity religion and no religion respectively.

The frequency of participation in religious activities was significantly related to substance use disorders among study participants ($p=0.018$). That is, substance use disorders were highest (59.4%) and lowest (10.9%) among participants with substance use disorders who participated in religious activities once a week or more and several times but less than once a month respectively.

The person lived with until age 15 was significantly related to substance use disorders among study participants ($p<0.001$). That is, substance use disorders were highest (77.2%) and lowest (3.0%) among participants with substance use disorders who lived with both parents and grandparents respectively.

The life status of the father of the study participants was significantly related to substance use disorders among study participants ($p=0.001$). That is, among the participants with substance use

disorders, 76.2% of their fathers were alive compared to 23.8% among those whose fathers were dead.

Father's educational level of study participants was significantly related to substance use disorders among study participants ($p<0.001$). That is, substance use disorders were highest (32.7%) and lowest (8.9%) among participants whose fathers had completed tertiary education and no education respectively.

The mother's educational level of study participants was significantly related to substance use disorders among study participants ($p<0.001$). That is, substance use disorders were highest (32.7%) and lowest (16.8%) among participants with substance use disorders whose mothers had completed basic school education and tertiary education respectively.

Participants' residency in the past 12 months was significantly related to substance use disorders among study participants ($p=0.019$). That is, among the participants with substance use disorders, 94.1% resided in the urban areas in the past 12 months compared to 5.9% among their counterparts.

Participants' current residence was significantly related to substance use disorders among study participants ($p=0.023$). That is, among the participants with substance use disorders, 90.1% are residing currently in the urban areas compared to 9.9% among their counterparts.

**Table 4.4: Relationship between socio-demographic factors and substance use disorders among study participants**

| Characteristics | SUD | | Total | Chi-square | P-value |
|---|---|---|---|---|---|
| | No | Yes | | test statistics | |
| | N (%) | N (%) | N (%) | | |
| **Sex** | | | | | |
| Female | 69 (22.8) | 23 (22.8) | 91 (22.5) | **12.3218** | **<0.001[a]** |
| Male | 234 (77.2) | 78 (77.2) | 313 (77.5) | | |
| **Age** | | | | | |
| 15-19 years | 76 (25.0) | 22 (21.8) | 98 (24.3) | **7.0430** | **0.007[a]** |
| 20-24 years | 112 (37.0) | 26 (25.7) | 138 (34.2) | | |
| 25-29 years | 76 (25.1) | 34 (33.7) | 110 (27.2) | | |
| 30+ years | 39 (12.9) | 19 (18.8) | 58 (14.3) | | |
| **Highest Educational level** | | | | | |
| none | 7 (2.3) | 5 (4.9) | 12 (3.0) | **8.4462** | **0.004[b]** |
| basic(primary/JHS) | 46 (15.2) | 14 (13.9) | 60 (14.9) | | |
| Secondary | 143 (47.2) | 43 (42.6) | 186 (46.0) | | |
| Tertiary | 107 (35.3) | 39 (38.6) | 146 (36.1) | | |
| **Employment status** | | | | | |
| Employed | 73 (24.1) | 18 (17.8) | 91 (22.5) | **11.7068** | **0.001[a]** |
| Unemployed | 230 (75.9) | 83 (82.2) | 313 (77.5) | | |
| **Marital status** | | | | | |
| single | 213 (70.3) | 69 (68.3) | 282 (69.8) | **15.8403** | **<0.001[b]** |
| Cohabiting | 24 (7.9) | 5 (5.0) | 29 (7.2) | | |
| Married | 55 (18.2) | 20 (19.8) | 75 (18.6) | | |
| Divorced | 11 (3.6) | 7 (6.9) | 15 (3.7) | | |
| **Number of children** | | | | | |
| None | 207 (68.3) | 66 (65.3) | 272 (67.6) | **17.3993** | **<0.001[b]** |
| 1-2 | 80 (26.4) | 24 (23.8) | 104 (25.7) | | |
| 3-4 | 10 (3.3) | 10 (9.9) | 20 (5.0) | | |
| 5 and above | 6 (2.0) | 1 (1.0) | 7 (1.7) | | |
| **Source of income** | | | | | |
| Salary/wage from legitimate job | 180 (59.4) | 67 (66.3) | 247 (61.1) | 8.3210 | 0.060[b] |
| Public assistance/charity | 6 (2.0) | 1 (1.0) | 7 (1.7) | | |
| Spouse/family | 117 (38.6) | 31 (30.7) | 148 (36.6) | | |
| Friends | 0 (0.0) | 2 (2.0) | 2 (0.5) | | |
| **Religious affiliation** | | | | | |
| None | 2 (0.7) | 0 (0.0) | 2 (0.5) | **8.9789** | **0.003[b]** |
| Christianity | 269 (88.8) | 86 (85.1) | 355 (87.9) | | |
| Islam | 32 (10.5) | 15 (14.9) | 47 (11.6) | | |
| **Frequency of participation in religious activities** | | | | | |
| once a week or more | 193 (63.7) | 60 (59.4) | 253 (62.6) | **5.5617** | **0.018[a]** |
| once a month or more but less than once a week | 47 (15.5) | 14 (13.9) | 61 (15.1) | | |
| several times but less than once a month | 26 (8.6) | 11 (10.9) | 37 (9.2) | | |
| did not attend /participate in any | 37 (12.2) | 16 (15.8) | 53 (13.1) | | |
| **Residency in the past 12 months** | | | | | |
| Rural | 17 (5.6) | 6 (5.9) | 23 (5.7) | **5.5154** | **0.019[a]** |
| Urban | 286 (94.4) | 95 (94.1) | 381 (94.3) | | |
| **Current residence** | | | | | |
| Rural | 30 (9.9) | 10 (9.9) | 40 (9.1) | **5.1918** | **0.023[a]** |

| | | | |
|---|---|---|---|
| Urban | 273 (90.1) | 91 (90.1) | 364 (90.1) |

p*<0.05, a=Pearson chi-square test, b= Fisher Exact test, JHS= Junior High School

### 4.5 Relationship between household characteristics and substance use disorders among study participants

Table 4.5 shows the relationship between household characteristics and substance use disorders among study participants. The household size of study participants was significantly related to substance use disorders among study participants (p=0.002). That is, substance use disorders were highest (72.3%) and lowest (12.9%) among participants with substance use disorders who had a household size of 5-9 and less than <5 respectively.

The person lived with until age 15 was significantly related to substance use disorders among study participants (p<0.001). That is, substance use disorders were highest (77.2%) and lowest (3.0%) among participants with SUD who lived with both parents and grandparents respectively. The life status of the father of the study participants was significantly related to substance use disorders among study participants (p=0.001). That is, among the participants with substance use disorders, 76.2% of fathers were alive compared to 23.8% among those whose fathers were dead.

Father's educational level of study participants was significantly related to substance use disorders among study participants (p<0.001). That is, substance use disorders were highest (32.7%) and lowest (8.9%) among participants with SUD whose fathers had completed tertiary education and no education respectively.

The mother's educational level of study participants was significantly related to substance use disorders among study participants (p<0.001). That is, substance use disorders were highest (32.7%) and lowest (16.8%) among participants with SUD whose mothers had completed basic school education and tertiary education respectively.

**Table 4.5: Relationship between household characteristics and substance use disorders among study participants**

| Characteristics | Development of SUD | | | | |
|---|---|---|---|---|---|
| | No N (%) | Yes N (%) | Total N (%) | Chi-square test statistics | P-value |
| **Household Size** | | | | | |
| < 5 | 31 (10.2) | 13 (12.9) | 44 (10.9) | **9.7113** | **0.002[b]** |
| 5-9 | 242 (79.9) | 73 (72.3) | 315 (78.0) | | |
| 10 and above | 30 (9.9) | 15 (14.8) | 45 (11.1) | | |
| **The person lived with until age 15** | | | | | |
| Both parents | 246 (81.2) | 78 (77.2) | 324 (80.2) | **19.2822** | **<0.001[b]** |
| Mother only | 25 (8.2) | 7 (6.9) | 32 (7.9) | | |
| Father only | 6 (2.0) | 8 (7.9) | 14 (3.5) | | |
| Grandparent | 5 (1.6) | 3 (3.0) | 8 (2.0) | | |
| Other relatives | 21 (7.0) | 5 (5.0) | 26 (6.4) | | |
| **The person currently living with** | | | | | |
| Both parents | 121 (39.9) | 34 (33.7) | 155 (38.4) | 4.0851 | 0.795[b] |
| Mother only | 24 (8.0) | 7 (6.9) | 31 (7.7) | | |
| Father only | 6 (2.0) | 1 (1.0) | 7 (1.7) | | |
| Grandparent/ other relatives | 20 (6.6) | 8 (7.9) | 28 (6.9) | | |
| Friends | 12 (4.0) | 2 (2.0) | 14 (3.5) | | |
| Alone | 66 (21.8) | 27 (26.7) | 93 (23.0) | | |
| Partner | 40 (13.2) | 15 (14.9) | 55 (13.6) | | |
| Other | 14 (4.6) | 7 (6.9) | 21 (5.2) | | |
| **Life status of Father** | | | | | |
| Dead | 73 (24.1) | 24 (23.8) | 97 (24.0) | **10.0045** | **0.001[b]** |
| Alive | 230 (75.9) | 77 (76.2) | 307 (76.0) | | |
| **Father's educational level** | | | | | |
| None | 23 (7.6) | 9 (8.9) | 32 (7.9) | **13.4062** | **<0.001[a]** |
| Basic (primary/JHS) | 60 (19.8) | 28 (27.7) | 88 (21.8) | | |
| Secondary | 104 (34.3) | 31 (30.7) | 135 (33.4) | | |
| Tertiary | 116 (38.3) | 33 (32.7) | 149 (36.9) | | |
| **Life status of the mother** | | | | | |
| Dead | 33 (10.9) | 16 (15.8) | 49 (12.1) | 1.7419 | 0.187[a] |
| Alive | 270 (89.1) | 85 (84.2) | 355 (87.9) | | |
| **Mother's educational level** | | | | | |
| None | 56 (18.5) | 26 (25.7) | 82 (20.3) | **12.9869** | **<0.001[a]** |
| Basic(primary/JHS) | 112 (37.0) | 33 (32.7) | 145 (35.9) | | |
| Secondary | 72 (23.7) | 25 (24.8) | 97 (24.0) | | |
| Tertiary | 63 (20.8) | 17 (16.8) | 80 (19.8) | | |
| **Parents' economic status** | | | | | |
| Poor | 52 (17.2) | 17 (16.8) | 69 (17.1) | 0.0750 | 0.963[a] |
| Middle income | 234 (77.2) | 79 (78.2) | 313 (77.5) | | |
| Rich | 17 (5.6) | 5 (5.0) | 22 (5.4) | | |

p*<0.05, a=Pearson chi-square test, b= Fisher Exact test, JHS= Junior High School

### 4.6 Relationship between social and environmental factors and substance use disorders among study participants

Table 4.6 shows the relationship between social and environmental factors and substance use disorders among study participants. Control over when and where to go at night was significantly related to substance use disorders among study participants (p=0.014). That is, among participants with substance use disorders, 52.5% had control over when and where to go at night compared to 47.5% among their counterparts.

Control over whether or not you use drugs was significantly related to substance use disorders among study participants (p=0.022). That is, among the participants with substance use disorders, 42.6% had control over whether or not to use drugs compared to 57.4% among their counterparts. Control over whether or not you drink alcoholic beverages was significantly related to substance use disorders among study participants (p<0.001). That is, among the participants with substance use disorders was 47.5% among those who had control over whether or not to drink alcoholic beverages compared to 52.5% among their counterparts.

The strictness of guardians was significantly related to substance use disorders among study participants (p=0.013). That is, substance use disorders were highest (70.3%) and lowest (13.9%) among participants whose guardians were not strict and extremely strict respectively as shown in Table 4.5. Relationship with parents was significantly related to substance use disorders among study participants (p<0.001). That is, substance use disorders were highest (58.4%) and lowest (6.9%) among participants whose relationship with their parents was warm and confronting respectively.

**Table 4.6: Relationship between social and environmental factors and substance use disorders among study participants**

| Characteristics | SUD No N (%) | Yes N (%) | Total N (%) | Chi-square test statistics | P-value |
|---|---|---|---|---|---|
| **Control over when and where they go at night** | | | | | |
| No | 150 (49.5) | 48 (47.5) | 198 (49.0) | **8.1189** | **0.014[a]** |
| Yes | 153 (50.5) | 53 (52.5) | 206 (51.0) | | |
| **Control over what friends they keep** | | | | | |
| No | 180 (59.4) | 60 (59.4) | 240 (59.4) | 0.1204 | 0.206[a] |
| Yes | 123 (40.6) | 41 (40.6) | 164 (40.6) | | |
| **Control over whether or not they use drugs** | | | | | |
| No | 168 (55.4) | 58 (57.4) | 226 (55.9) | **5.1205** | **0.022[a]** |
| Yes | 135 (44.6) | 43 (42.6) | 178 (44.1) | | |
| **Control over whether or not they go to work or school** | | | | | |
| No | 157 (51.8) | 45 (44.5) | 202 (50.0) | 1.5974 | 0.206[a] |
| Yes | 146 (48.2) | 56 (55.5) | 202 (50.0) | | |
| **Control over whether or not they drink alcoholic beverages** | | | | | |
| No | 167 (55.1) | 53 (52.5) | 220 (54.5) | **12.2129** | **<0.001[a]** |
| Yes | 136 (44.9) | 48 (47.5) | 184 (45.5) | | |
| **Control over how they spend your money** | | | | | |
| No | 189 (62.4) | 62 (61.4) | 251 (62.1) | 0.0316 | 0.859[a] |
| Yes | 114 (37.6) | 39 (38.6) | 153 (37.9) | | |
| **Strictness of guardian** | | | | | |
| Normal | 57 (18.8) | 16 (15.8) | 73 (18.1) | **6.1647** | **0.013[a]** |
| Not strict | 189 (62.4) | 71 (70.3) | 260 (64.3) | | |
| Extremely strict | 57 (18.8) | 14 (13.9) | 71 (17.6) | | |
| **Relationship with parents** | | | | | |
| Good | 131 (43.2) | 35 (34.7) | 166 (41.1) | **12.4035** | **<0.001[a]** |
| Warm | 156 (51.5) | 59 (58.4) | 215 (53.2) | | |
| Confronting | 16 (5.3) | 7 (6.9) | 23 (5.7) | | |
| **Strength of family ties** | | | | | |
| Strong | 144 (47.5) | 40 (39.6) | 184 (45.6) | 3.2093 | 0.191[b] |
| Moderate | 150 (49.5) | 55 (54.5) | 205 (50.7) | | |
| Weak | 9 (3.0) | 6 (5.9) | 15 (3.7) | | |
| **Any family member who uses drugs** | | | | | |
| No | 160 (52.8) | 52 (51.5) | 212 (52.5) | **7.2529** | **0.008[b]** |
| Yes | 143 (47.2) | 49 (48.5) | 192 (47.5) | | |
| **Any friend who uses drugs** | | | | | |
| No | 106 (35.0) | 34 (33.7) | 140 (34.7) | **10.6583** | **0.001[a]** |
| Yes | 197 (65.0) | 67 (66.3) | 264 (65.3) | | |
| **Any area in the vicinity where hard drugs are traded** | | | | | |
| No | 134 (44.2) | 44 (43.6) | 178 (44.1) | **12.0134** | **<0.001[a]** |
| Yes | 169 (55.8) | 57 (56.4) | 226 (55.9) | | |

p*<0.05, a=Pearson chi-square test, b= Fisher Exact test, JHS= Junior High School

Any family member who uses drugs was significantly related to substance use disorders among study participants (p=0.008). That is, among participants with substance use disorders, 48.5% had family members who use drugs compared to 51.5% among their counterparts.

Any friend who uses drugs was significantly related to substance use disorders among study participants (p=0.001). That is, among participants with substance use disorders, 66.3% had friends who use drugs compared to 33.7% among their counterparts.

Any area in the vicinity where hard drugs are traded was significantly related to substance use disorders among study participants (p=0.001). That is, among participants with substance use disorders,56.4% lived in an area where hard drugs are traded compared to 43.6% among their counterparts.

**4.7 Multiple logistic regression analysis of factors associated substance use disorders among study participants**

Table 4.7 shows the multiple logistic regression analysis of the factors influencing substance use disorders among the study participants. The Wald Chi-square value was 294.13 with $p<0.05$. This showed the multiple logistic regression model that was used to explain the factors that influence substance use disorders among the study participants.

The multiple logistic regression analysis showed that sex, age, highest educational level, employment status, residential status, control over when and where to go at night, control over whether or not to use drugs, and any friend who uses drugs had a statistically significant association with substance use disorders among the study participants.

Male participants had 1.5 ($AOR = 1.5,\ p = 0.001$) higher odds of substance use disorders compared to female participants. Participants who belonged to the age group 25-29 years had 30%

($AOR = 0.7,\ p = 0.024$) lower odds of substance use disorders compared to participants who belonged to the age group 15-19 years. Also, participants who belonged to the age group 30+ years had 40% ($AOR = 0.6,\ p = 0.033$) lower odds of substance use disorders compared to participants who belonged to the age group 15-19 years.

Participants who had attained tertiary education had 30% ($AOR = 0.7,\ p = 0.016$) reduced odds of substance use disorders compared to participants who had no education. Participants who are employed had 40% ($AOR = 0.6,\ p = 0.007$) reduced odds of substance use disorders compared to unemployed participants. Participants who are currently residing in the urban areas had 60% ($AOR = 0.4,\ p = 0.019$) reduced odds of substance use disorders compared to participants who are currently residing in the rural areas.

Participants whose household size is 10 and above had 1.2 times ($AOR = 1.2,\ p = 0.008$) higher odds of substance use disorders compared to participants whose household size is less than 5. Participants who lived with their mother only until age 15 had 1.4 times ($AOR = 1.4,\ p = 0.001$) higher odds of substance use disorders compared to participants who lived with both parents until age 15. Participants who lived with their father only until age 15 had 3.0 times ($AOR = 3.0,\ p = 0.019$) higher odds of substance use disorders compared to participants who lived with both parents until age 15.

Participants whose father is alive had 70% lower ($AOR = 0.3,\ p = 0.001$) odds of substance use disorders compared to participants whose father is dead. Participants whose father had attained tertiary education had 40% lower ($AOR = 0.6,\ p = 0.016$) odds of substance use disorders compared to participants whose father had no education.

**Table 4.7: Multiple Logistic Regression Analysis of factors associated with substance use disorders among youths at the drug rehabilitation centre**

| | Crude Odds Ratio | | | Adjusted Odds Ratio | | |
|---|---|---|---|---|---|---|
| **Factors** | OR | P-value | 95% CI | OR | P-value | 95% CI |
| **Sex** | | | | | | |
| Female | 1 | | | 1 | | |
| Male | **1.5** | **0.029*** | **1.2, 2.5** | **1.5** | **0.001*** | **1.1, 4.8** |
| **Age** | | | | | | |
| 15-19 years | 1 | | | 1 | | |
| 20-24 years | **0.2** | **0.008*** | **0.1, 0.5** | 0.3 | 0.643 | 0.1, 0.7 |
| 25-29 years | **0.5** | **0.001*** | **0.2, 0.9** | **0.7** | **0.024*** | **0.3, 0.8** |
| 30+ years | **0.4** | **0.019*** | **0.1, 0.6** | **0.6** | **0.033*** | **0.1, 0.8** |
| **Highest Educational level** | | | | | | |
| none | 1 | | | 1 | | |
| basic(primary/JHS) | **0.4** | **0.016*** | **0.1, 0.6** | 0.5 | 0.389 | 0.1, 2.3 |
| Secondary | **0.4** | **0.007*** | **0.1, 0.7** | 0.5 | 0.336 | 0.1, 2.1 |
| Tertiary | **0.5** | **0.004*** | **0.2, 1.7** | **0.7** | **0.016*** | **0.2, 0.9** |
| **Employment status** | | | | | | |
| Unemployed | 1 | | | 1 | | |
| Employed | **0.5** | **0.003*** | **0.1, 0.8** | **0.6** | **0.007*** | **0.1, 0.8** |
| **Marital status** | | | | | | |
| single | 1 | | | | | |
| Cohabiting | 0.6 | 0.387 | 0.2, 1.7 | | | |
| Married | 0.1 | 0.696 | 0.6, 2.0 | | | |
| Divorced | 0.7 | 0.064 | 0.9, 7.7 | | | |
| **Number of children** | | | | | | |
| None | 1 | | | 1 | | |
| 1-2 | 0.9 | 0.823 | 0.6, 1.6 | 0.5 | 0.071 | 0.3, 1.1 |
| 3-4 | **0.1** | **0.015*** | **0.0, 0.9** | 0.4 | 0.114 | 0.1, 6.9 |
| 5 and above | **0.5** | **0.002*** | **0.1, 0.7** | 0.2 | 0.240 | 0.0, 2.6 |
| **Religious affiliation** | | | | | | |
| None | **1** | | | 1 | | |
| Christian | **0.7** | **0.006*** | **0.4, 0.9** | 0.7 | 0.346 | 0.3, 1.5 |
| Muslim | **0.5** | **0.014*** | **0.2, 0.6** | 0.8 | 0.141 | 0.2, 1.9 |
| **Frequency of participation in religious activities** | | | | | | |
| Did not attend/ participate in any | 1 | | | 1 | | |
| Once a week or more | 0.6 | 0.107 | 0.5, 1.9 | 0.4 | 0.810 | 0.2, 2.4 |
| Once a month or more but less than once a week | 0.8 | 0.428 | 0.6, 2.9 | 0.8 | 0.763 | 0.5, 2.7 |
| Several times but less than once a month | **0.3** | **0.023*** | **0.2, 0.7** | 0.4 | 0.922 | 0.2, 1.3 |
| **Current residence** | | | | | | |
| Rural | 1 | | | **1** | | |
| Urban | **0.4** | **0.028*** | 0.2, 0.9 | **0.4** | **0.019*** | **0.1, 0.8** |
| **Household Size** | | | | | | |
| < 5 | 1 | | | 1 | | |
| 5-9 | **3.7** | **0.015**** | **2.4, 16.4** | 1.7 | 0.385 | 0.3, 4.2 |
| 10 and above | **5.2** | **0.001**** | **3.5, 12.9** | **1.2** | **0.008*** | **1.1, 3.5** |
| **The person lived with until age 15** | | | | | | |
| both parents | 1 | | | 1 | | |
| mother only | **3.9** | **<0.001*** | **1.3, 9.1** | **1.4** | **0.001*** | **1.3, 1.8** |
| father only | **4.2** | **0.010*** | **1.4, 12.5** | **3.0** | **0.019*** | **1.8, 11.1** |
| Grandparent | **1.9** | **<0.001*** | **1.4, 8.1** | 2.9 | 0.196 | 0.6, 14.1 |
| other relatives (uncle, aunt, etc.) | 5.8 | 0.764 | 0.3, 2.6 | 2.1 | 0.571 | 0.2, 2.6 |

**Table 4.7: Multiple Logistic Regression Analysis of factors associated with substance use disorders among youths at the drug rehabilitation center (Con't)**

| | Crude Odds Ratio | | | Adjusted Odds Ratio | | |
|---|---|---|---|---|---|---|
| **Factors** | OR | P-value | 95% CI | OR | P-value | 95% CI |
| **Live status of Father** | | | | | | |
| Dead | 1 | | | 1 | | |
| Alive | **0.4** | **<0.001**** | **0.1, 0.7** | **0.3** | **0.001*** | **0.1, 0.9** |
| **Father's highest educational level** | | | | | | |
| none | 1.0 | | | 1 | | |
| basic(primary/JHS) | **0.2** | **0.019**** | **0.1, 0.6** | 1.5 | 0.446 | 0.5, 4.4 |
| Secondary | **0.8** | **0.007**** | **0.3, 0.9** | 1.1 | 0.891 | 0.4, 3.1 |
| Tertiary | **0.7** | **0.028**** | **0.3, 0.8** | **0.6** | **0.016*** | **0.3, 0.8** |
| **Mother's highest educational level** | | | | | | |
| none | 1.0 | | | | | |
| Basic (primary/JHS) | 0.6 | 0.141 | 0.3, 1.2 | | | |
| Secondary | 0.7 | 0.381 | 0.4, 1.4 | | | |
| Tertiary | 0.6 | 0.134 | 0.3, 1.2 | | | |
| **Control over when and where they go at night** | | | | | | |
| No | 1.0 | | | 1 | | |
| Yes | **0.3** | **0.030**** | **0.1, 0.7** | **0.2** | **0.040*** | **0.0, 0.6** |
| **Control over whether or not they use drugs** | | | | | | |
| No | 1.0 | | | 1 | | |
| Yes | **0.4** | **0.009**** | **0.1, 0.8** | **0.6** | **0.007*** | **0.2, 0.8** |
| **Control over whether or not they drink alcoholic beverages** | | | | | | |
| No | 1.0 | | | 1 | | |
| Yes | **0.1** | **0.001**** | **0.1, 0.7** | 0.3 | 0.252 | 0.2, 1.6 |
| **Strictness of guardian** | | | | | | |
| Normal | 1.0 | | | | | |
| Not strict | 0.3 | 0.355 | 0.2, 2.5 | | | |
| Extremely strict | 0.6 | 0.745 | 0.4, 1.5 | | | |
| **Relationship with parents** | | | | | | |
| Good | 1.0 | | | 1 | | |
| Warm | **1.4** | **0.014**** | **1.2, 5.3** | 1.5 | 0.177 | 0.8, 2.5 |
| Confronting | **2.6** | **0.006**** | **1.6, 4.3** | 2.2 | 0.154 | 0.7, 6.8 |
| **Any family member who uses drugs** | | | | | | |
| No | 1.0 | | | | | |
| Yes | 1.4 | 0.118 | 0.7, 3.7 | | | |
| **Any friend who uses drugs** | | | | | | |
| No | 1.0 | | | 1 | | |
| Yes | **5.2** | **0.019**** | **3.7, 9.7** | **1.7** | **0.004*** | **1.2, 2.4** |
| **Any area in the vicinity where hard drugs are traded** | | | | | | |
| No | 1.0 | | | 1 | | |
| Yes | **7.6** | **0.008**** | **2.6, 11.5** | 2.8 | 0.574 | 0.5, 3.5 |

*p<0.05

Participants who have control over when and where to go at night had 80% ($AOR = 0.2,\ p = 0.040$) of reduced odds of substance use disorders compared to participants who do not have control over when and where to go at night.

Participants who have control over whether or not to use drugs had 40% ($AOR = 0.6,\ p = 0.007$) reduced odds of substance use disorders compared to participants who do not have control over whether or not to use drugs.

Participants who have any friend who uses drugs have 1.7 times ($AOR = 1.7,\ p = 0.004$) higher odds of substance use disorders compared to participants who do not have any friend who uses drugs.

### 4.8 Cost of SUDs rehabilitation

#### 4.8.1 Direct cost of SUDs rehabilitation

As shown in Table 4.8, the direct cost for rehabilitation was approximately GHS 190,047.00. The direct cost comprises medical cost, which was estimated at GHS 165,591.00, and the non-medical cost, which was estimated at GHS 24, 456.00. Averagely, a patient spends an estimated, GHS 15, 88.60 as a direct cost on rehabilitation, of which medical cost consumes approximately 74.4% whereas non-medical cost covers 11% of all cost of the total cost. Ultimately, the direct cost makes up 84.5% of the total cost.

#### 4.8.2 Indirect cost of drug addiction rehabilitation

The total indirect cost was GHS 32, 396.50 representing 14.6% of the total cost of rehabilitation. The total productivity loss concerning patients and accompanying relatives was GHS 217, 904.00. and GHS 4,539.50 respectively. Estimated cost relative to the patient was grouped; days lost for being absent from work, time spent traveling to and from the health facility, and time spent waiting

before being called to see the doctor or health officer for treatment. The estimated cost was high for days lost for being absent from work GHS 14, 829.00 representing 6.7% of drug addict rehabilitation cost. Costs of time spent traveling to and from the health facility and time spent waiting before being called to see the doctor or health officer for treatment were estimated at GHS 8, 377.00 and GHS 4, 651.00 respectively.

The average household expenditure on rehabilitation was estimated at GHS 4,445.6 while the average cost attributable to the patient only was approximately GHS 4,356.7 representing 98% of the total cost (Table 4.8). The direct and indirect cost estimates for rehabilitation were 85.4% and 14.6% respectively of the total cost.

### 4.8.3 Differences in the mean rehabilitation cost across different socio-demographic characteristics of study participants

The independent t-test was used to test the difference in the mean rehabilitation cost among gender and residential status while the one-way ANOVA was used to test the difference in the mean rehabilitation cost among parent economic status and orphan status. From Table 4.9, the study found that the mean indirect cost of patients from the urban communities (472.1 ± 196.4) was statistically higher compared to the mean indirect cost of patients from the rural communities (181.2 ± 100.3), $p < 0.05$.

**Table 4.8 Direct and indirect costs**

| Cost type | Cost (GHS) | Mean | Standard deviation | Median | Minimum | Maximum | Cost profile (%) |
|---|---|---|---|---|---|---|---|
| **Direct medical costs** | | | | | | | |
| Registration | 117099 | 975.8 | 2853.1 | 450 | 0 | 30000.0 | 52.6 |
| Consultation | 16577 | 138.1 | 391.4 | 0 | 0 | 3000.0 | 7.5 |
| Laboratory & other rehab services | 8957 | 74.6 | 241.1 | 0 | 0 | 999.0 | 4.0 |
| Medicines/drugs | 10526 | 87.7 | 380.5 | 0 | 0 | 3500.0 | 4.7 |
| Other expenditure | 7437 | 61.9 | 232.4 | 0 | 0 | 999.0 | 3.3 |
| Cost of a specific tool | 4995 | 46.7 | 0.0 | 0 | 0 | 999.0 | 2.2 |
| **Total** | **165591** | **1384.8** | **4098.5** | **450** | **0** | **39497.0** | **74.4** |
| **Direct non-medical costs** | | | | | | | |
| Transportation | 6964 | 58.0 | 201.5 | 0 | 0 | 999.0 | 3.1 |
| Food & drink | 5977 | 49.8 | 199.5 | 0 | 0 | 999.0 | 2.7 |
| Water | 5722.4 | 47.7 | 199.8 | 0 | 0 | 999.0 | 2.6 |
| Other (phone calls) | 5792.6 | 48.3 | 199.7 | 0 | 0 | 999.0 | 2.6 |
| **Total** | **24456** | **203.8** | **800.5** | **0** | **0** | **3996.0** | **11.0** |
| **Overall direct costs** | **190047** | **1588.6** | **4899.0** | **450** | **0** | **43493.0** | **85.4** |
| **Indirect medical cost** | | | | | | | |
| Absenteeism from work/school | 14829 | 1460.7 | 4298.9 | 0 | 0 | 32505.0 | 6.7 |
| Travel | 8377 | 892.0 | 2657.4 | 0 | 0 | 17730.0 | 3.8 |
| Waiting time before consultation | 4651 | 504.4 | 2131.4 | 0 | 0 | 11808.2 | 2.0 |
| **Total** | **27857** | **2857.0** | **9087.7** | **0** | **0** | **62043.2** | **12.5** |
| Person accompanying patient | 4539.5 | 4539.5 | 4539.5 | 4539.5 | 4539.5 | 4539.5 | 2.0 |
| **Overall indirect costs** | **32396.5** | **7396.54** | **13627.1** | **4539.5** | **4539.5** | **66582.7** | **14.6** |
| **Patient total** | **217904** | **4356.7** | **13986.59** | **450** | **0** | **105536.2** | **98.0** |
| **Grand Total** | **222443.5** | **4445.6** | **13986.6** | **450** | **0** | **105536.2** | **100** |

**Table 4.9: Differences in the mean rehabilitation cost across different socio-demographic characteristics of study participants**

| Variable | Type of cost | | |
|---|---|---|---|
| | Direct cost (Ghc) | Indirect cost (Ghc) | Total cost (Ghc) |
| | Mean ± SD | Mean ± SD | Mean ± SD |
| **Gender** | | | |
| Male | 2367.6 ± 1358.5 | 248.2 ± 107.5 | 2615.8 ± 1211.3 |
| Female | 1549.6 ± 985.5 | 231.4 ± 94.2 | 1781.1 ± 1009.0 |
| Test Statistic | 0.496 | 0.080 | 0.481 |
| p-value | 0.664 [a] | 0.951 [a] | 0.684 [a] |
| **Resident** | | | |
| Urban | 2866.0 ± 1294.2 | 472.1 ± 196.4 | 3338.2 ± 1396.7 |
| Rural | 1311.7 ± 959.4 | 181.2 ± 100.3 | 1492.9 ± 1214.0 |
| Test Statistic | 1.821 | **2.317** | 1.691 |
| p-value | 0.114[a] | **0.043**[a***] | 0.085[a] |
| **Parent economic status** | | | |
| Rich | 2109.2 ± 1376.0 | 222.3 ± 144.5 | 2331.4 ± 168.0 |
| Middle income | 1398.5 ± 1244.3 | 223.9 ± 176.6 | 1622.5 ± 1190.4 |
| Poor | 1480.4 ± 1195.7 | 318.1 ± 219.3 | 1798.5 ± 1669.3 |
| Test Statistic | 0.453 | 0.369 | 0.392 |
| p-value | 0.721[b] | 0.885[b] | 0.763[b] |
| **Orphan status** | | | |
| Mother alive | 1486.7 ± 1040.3 | 74.2 ± 23.8 | 1560.9 ± 1280.1 |
| Father alive | 792.54 ± 209.4 | 194.2 ± 101.4 | 986.7 ± 766.2 |
| Both alive | 1846.3 ± 1138.6 | 302.7 ± 195.4 | 2148.8 ± 1995.2 |
| Non-alive | 1336.0 ± 995.6 | 247.9 ± 110.8 | 1583.9 ± 1006.1 |
| Test Statistic | 0.783 | 0.247 | 0.279 |
| p-value | 0.432 [b] | 0.863 [b] | 0.837 [b] |

**a=Independent t-test, b=One-way ANOVA**
***p<0.05**

### 4.9 Sensitivity analysis of the cost of drug addiction rehabilitation

Table 4.10 provides details of sensitivity analysis of the cost of rehabilitation. The one-way and multi-way sensitivity analysis of cost was done using cost for medication and wages. The cost of medication and hourly wage incurred by patients and relatives during rehabilitation was selected

due to the high volatility associated with them. An increase in the cost of medication leads to an increase in total cost. As shown in the table, an increase in medication by 3% leads to a 0.1% increase in total cost. Similarly, an increase in medication cost by 5 and 7% lead to an increase in total cost by 0.2% and 0.3%. The direct cost increases by 0.1% (thus from 85.4% to 85.5%) and indirect cost component decreased by 0.1% (thus from 14.6% to 14.5%) when varied with 3%. Variation by 5% and 7% lead to similar change indirect cost, thus increasing from 85.4% to 85.5% for both parameters. When the cost of wages was increased by 3%, the total cost of treatment increased by 0.4%. The direct cost component of the total cost decreased by 0.3% (thus from 85.4-85.1%) and the indirect cost component increased by 0.3% (thus from 14.6% to 14.9%). When the cost of wages was increased by 5% and 7%, there was an increase in total cost by 0.7% and 1% respectively. A variation by 5% caused an increase in indirect cost by 0.6% (thus from 14.6% to 15.2%) whereas variation by 7% caused an increase in indirect cost by 0.8% (thus from 14.6% to 15.4%).

A concurrent variation in medicines/drugs and the daily minimum wage resulted in a 0.6%, 0.9%, and 1.4% increase in the total cost, while the indirect cost increased by 0.3%, 0.5%, and 0.8% respectively and the direct cost decreased by similar margins.

**Table 4.10: Sensitivity analysis of the cost of drug addiction rehabilitation**

| Scenario | Cost component | % change in parameter | Total cost | change in the total cost % | % of the total cost | | % change in the total cost | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Direct | Indirect | Direct | Indirect |
| **Basic Scenario** | **Grand Total 222,443.50** | 0.0 | 222,443.5 | 0.0 | 85.4 | 14.6 | 0 | 0 |
| **Variation (One-way sensitivity analysis)** | **Medicines/drugs** 10,526 | | | | | | | |
| | | 3% | 222,759.3 | 0.1 | 85.5 | 14.5 | 0.1 | -0.1 |
| | | 5% | 222,969.8 | 0.2 | 85.5 | 14.5 | 0.1 | -0.1 |
| | | 7% | 223,180.3 | 0.3 | 85.5 | 14.5 | 0.1 | -0.1 |
| **Variation (One-way sensitivity analysis)** | **Wage rate** 32,396.5 | | | | | | | |
| | | 3% | 223,415.4 | 0.4 | 85.1 | 14.9 | -0.3 | 0.3 |
| | | 5% | 224,063.3 | 0.7 | 84.8 | 15.2 | -0.6 | 0.6 |
| | | 7% | 224,711.3 | 1.0 | 84.6 | 15.4 | -0.8 | 0.8 |
| **Multi-way sensitivity analysis** | **Medicines/drugs &Wage rate** 42,922.50 | | | | | | | |
| | | 3% | 223,731.2 | 0.6 | 85.1 | 14.9 | -0.3 | 0.3 |
| | | 5% | 224,589.6 | 0.9 | 84.9 | 15.1 | -0.5 | 0.5 |
| | | 7% | 225,448.1 | 1.4 | 84.6 | 15.4 | -0.8 | 0.8 |

***Cost of medicines/drugs and wage were varied by 3%, 5%, and 7% respectively***

***USD 1.00 equivalent to GHS5.8 (Bank of Ghana interbank exchange rate, 7th October 2020)***

***The national minimum wage per day of GHS11.85 as of October 2020 was used to value productivity days and time lost to patients***

### 4.9.1 Intangible cost

Figure 4.2 shows the overall intangible burden on family members of case participants. An overall intangible cost score less than or equal to 17 was considered as a low burden and a high burden, otherwise (Bedard *et al*., 2001). Out of 101 family members of case participants, 57.4% of them experienced a high intangible burden.

## 4.10 Compliance of Drug Rehabilitation Centres in Ghana to UNODC standard

Table 4.11 presents the compliance of the drug rehabilitation centres in Ghana to UNODC standards. The overall average compliance of Compassion Drug Rehabilitation Centre to UNODC standard was 1.98 (± 0.90) with the highest domain being clinical governance with a mean of 2.79 (±0.56). Also, the overall average compliance of Pantang drug rehab center to UNODC standard was 2.05 (±0.82) with the highest domain being clinical governance with a mean of 2.81 (±0.40). Furthermore, from Table 4.11, the overall average compliance of Remar drug rehab center to UNODC standard was 1.66 (±1.04) with the highest domain being availability and accessibility of drug dependence treatment with a mean of 2.40 (±0.77). Finally, the overall average compliance of the House of St Francis drug rehab center to UNODC standard was 1.59 (±0.92) with the highest domain being human rights and dignity of the patient/client with a mean of 2.52 (±0.70).

The overall mean of the UNODC standard is 3.0 (±0.0). Comparing the compliance of all the four rehabilitation centres to the UNODC standard, the study found that, on average, the compliance by all the four rehabilitation centres to the UNODC standard was inadequately met.

**Table 4.11 Compliance of Drug Rehabilitation in Ghana to UNODC Guidelines**

| Compliance Domain | Compassion Drug Rehab Centre<br>Mean (±SD) | Pantang Drug Rehab Centre<br>Mean (±SD) | Remar Drug Rehab Centre<br>Mean (±SD) | House of St Francis Rehab<br>Mean (±SD) | UNODC standards<br>Mean (±SD) |
|---|---|---|---|---|---|
| Availability and accessibility of drug dependence treatment | 1.72 (±1.15) | 1.92 (±0.96) | 2.40 (±0.77) | 2.48 (±0.74) | 3.00 (±0.0) |
| Screening, assessment, diagnosis, and treatment planning | 1.58 (±1.21) | 1.20 (±1.42) | 1.00 (±1.04) | 0.96 (±1.22) | 3.00 (±0.0) |
| Evidence-based drug dependence treatment | 1.35 (±1.31) | 1.63 (±1.28) | 2.21 (±1.14) | 1.30 (±0.92) | 3.00 (±0.0) |
| Human rights and dignity of the patient/client | 2.48 (±0.51) | 2.44 (±0.51) | 2.11 (±1.01) | 2.52 (±0.70) | 3.00 (±0.0) |
| Targeting special subgroups and conditions | 1.21 (±0.97) | 2.18 (±0.66) | 1.65 (±1.19) | 0.75 (±1.06) | 3.00 (±0.0) |
| Treatment as an alternative to prison and in prison settings | - | 1.33 (±1.15) | 0.67 (±1.04) | 0.40 (±0.89) | 3.00 (±0.0) |
| Community-based treatment | 2.38 (±0.49) | 2.42 (±0.51) | 1.09 (±1.15) | 1.75 (±1.12) | 3.00 (±0.0) |
| Clinical governance | 2.79 (±0.56) | 2.81 (±0.40) | 1.95 (±0.93) | 2.33 (±0.76) | 3.00 (±0.0) |
| Policy development and strategic planning within the treatment system | 2.33 (±1.02) | 2.50 (±0.51) | 1.87 (±1.06) | 1.79 (±0.90) | 3.00 (±0.0) |
| **Overall Score** | **1.98 (± 0.90)** | **2.05 (±0.82)** | **1.66 (±1.04)** | **1.59 (±0.92)** | **3.00 (±0.0)** |

SD= Standard Deviation

## 4.11 Experiences of the youth who are in rehabilitation for substance use disorders and their families in Ghana

### 4.11.1 Background characteristics of qualitative study participants

Table 4.12 provides a summary of the essential characteristics of twenty-one individuals in rehabilitation in the four-drug rehabilitation facilities who were interviewed and thirty-two individuals in rehabilitation in the four-drug rehabilitation facilities who participated in the focused group discussion for the qualitative component of the study.

**Table 4.12: Summary characteristics of individuals in rehabilitation in the four-drug rehabilitation facilities**

| Characteristics | In-depth Interview N = 21 | Focused Group Discussion N = 32 |
|---|---|---|
| **Gender** | | |
| Male | 18 | 26 |
| Female | 3 | 6 |
| **Age** | | |
| 15-20 | 3 | 3 |
| 21-25 | 11 | 18 |
| 26-30 | 6 | 4 |
| 31-35 | 1 | 7 |
| **Marital Status** | | |
| Single | 14 | 22 |
| Cohabiting | 4 | 7 |
| Married | 3 | 3 |
| **Highest Educational Level** | | |
| Basic | 1 | 2 |
| Secondary | 9 | 11 |
| Tertiary | 11 | 19 |
| **Religion** | | |
| No religion | 2 | 2 |
| Christianity | 17 | 27 |
| Islam | 2 | 3 |

From Table 4.12, for individuals in rehabilitation who were interviewed, 18 were males, 14 were single, 11 belonged to the age group 21-25 years, 11 had completed tertiary, and 17 were Christians. Also, from Table 4.11, for individuals in rehabilitation who participated in the focus group discussion, 26 were males, 18 belonged to the age group 21-25 years, 22 were single, 19 had completed tertiary, and 27 were Christians.

**4.12 The experiences of the youth who are in rehabilitation for substance use disorders.**

Participants expressed varying views on their experiences with using mood-altering substances and being at the drug rehabilitation for substance use disorders. The responses provided by the 21 participants who took part in the in-depth interview and 32 participants in the focus group discussion yielded different blocks of coded text. Further grouping of the codes based on the recurrence of the themes resulted in two major themes. They are (1) drivers of drug addiction, and (2) experiences of the participants at the drug rehabilitation centre.

Each of these themes comprises sub-themes. These sub-themes are presented in Table 4.13 and are described in detail below with illustrative quotes. With regards to the drivers of drug addiction, the study explored individual factors associated with drug addiction. This category explicitly examined and inquired specific motives of addicts that they believed could influence their addiction. Sub-themes derived for the drivers of drug addiction are peer influence, loss of loved ones, curiosity, broken home, and pain and anxiety.

The sub-themes for experiences at the drug rehabilitation centre are the success of the drug rehabilitation centre and the quality of the drug rehabilitation centres. These components explored the dynamics of patients' participation in the rehabilitation programme. The success of the rehabilitation programme was explored by linking the perception of patients with their perceived

benefits to the perception of the rehabilitation accomplishing its intended purpose. The quality of rehabilitation centres defines the essential and distinguishing attributes of the rehabilitation programme.

**Table 4.13: Summary of Experiences of using drug substances and being at the drug rehabilitation center**

| Main Themes | Subthemes | |
|---|---|---|
| **Drivers of drug addiction** | i. | Peer influence. |
| | ii. | Loss of loved ones. |
| | iii. | Curiosity. |
| | iv. | Broken home. |
| | v. | Pain and anxiety |
| **Experiences of the participants at the drug rehabilitation center** | i. | The success of the drug rehabilitation center. |
| | ii. | The perception of participants concerning the rehabilitation centers. |

### 4.12.1 Drivers of drug addiction

Participants expressed varying views on the drivers of drug addiction. The responses provided by the 21 participants who took part in the in-depth interview and 32 participants who took part in the focus group discussion yielded different blocks of coded text. Further grouping of the codes based on the recurrence of the themes resulted in five major sub-themes. They comprise peer influence, loss of loved ones, curiosity, broken home, pain and anxiety.

#### 4.12.1.1 Peer Influence

Some participants attributed drug addition to peer pressure. Some participants specifically said:

*"... mine also was in school, I was introduced to it (substance use) by my dorm prefect. It was an entertainment time, and we all, all of the guys in the house only prepared to at least go out for a show"* ***(P.6).***

Another participant declared that:

*"We were all one way or the other led by friends into drugs. So usually are the friends who constitute a lot on our falling. And it's not usually on only drugs, gambling, prostitution, you know there are a whole lot of things"* ***(P.2)***

Similarly, a participant declared that:

*"I got acquainted with some friends in the neighborhood who play football for a division two club. They introduced me to narcotics and I became addicted to it"* ***(F1.3).***

A participant stated that peer pressure was the main driver of drug addiction:

*"I attended an after-school party and the lady I was dancing with pulled a cigarette from her bag and started smoking it. She asked me to try it and I did"* ***(F3.1).***

#### 4.12.1.2 Loss of loved one

A participant mentioned that loss of a loved one was what drove him into being a drug addict. Although this was mentioned by only one participant, it emerged as a critical cause:

*"...The death of my mum shocked me and led me into taking drugs"* ***(F1.4).***

#### 4.12.1.3 Curiosity

Curiosity emerged as another vital sub-theme influencing drug addiction. Almost all participants mentioned they were introduced to drugs due to curiosity.

*"I used to listen to my mates talk about how smoking wee makes them become "high" when performing on stage. I became so curious and want to give it a try"* ***(F4.6).***

Another participant stated that:

*"I used to witness my uncle go to an uncompleted building opposite our house to smoke wee. I was eager to know more about smoking wee so one day I stole some wee from his pocket and went to try it"* ***(F3.7).***

In support of the view expressed by another participant as stated above:

*"...it was like, order of the day, if you're not in it, you were considered to be outmoded. You were not abreast with time so I was curious at that time, peradventure so I entered into narcotics"* ***(P.5).***

#### 4.12.1.4 Broken Homes

Victims of broken homes attributed to lack of proper supervision at home as an initial step that influences their drug addiction. According to some participants;

*" I live with my mother alone because my parents are divorced. Whenever she leaves to sell in the market in the morning, I will also leave to my friend's house to play a video game. One day I visited him and saw him smoking a cigarette in the act. He told me to try it and I did"* ***(F2.6).***

Another participant stated that:

*"My Dad abandoned us when I was in SHS 2. I had to stop school and work to support my mum and my four younger siblings. I got a job at a nightclub as a waiter. I was 20 years by then. I met this client who was a drug dealer and he introduced me into trading drugs and smoking it"* ***(F4.2).***

#### 4.12.1.5 Pain and Anxiety

Pain and anxiety emerged as non-medical reasons for drug use. Two participants reported they used drugs to ease their pain and increase their self-esteem levels:

*"... mine was erred, a pain. Yes, and then umm, they did endoscopy for me at Korle Bu. So, a doctor prescribed that drug for me just to relieve my pains. But later on, I found out that the drug was available at my workplace. Because I was working at the hospital, I had easy access"* ***(P.3).***

*"Yes, you know when you find it difficult to talk in public or you think you're not of that standard and there's anxiety, a friend can influence maybe marijuana or use cocaine and you will be able to function well in public"* **(F3.5).**

### 4.12.2 Experiences of youth in rehabilitation on drug addiction

Participants expressed varying views on the experiences of the youth in rehabilitation on drug addiction. The responses provided by the participants on their experiences comprise success of the rehabilitation programme and quality of the rehabilitation.

#### 4.12.2.1 Success of the rehabilitation programme

The Participants had a varied understanding of the success of the rehabilitation programme. Consistent among them were healthy status, an improvement in their social interactions with friends and relatives, financial stability, and intense education. With regards to their health status, some participants specifically mentioned:

*"I have regained my energy, my looks, and the right frame of mind to go about my normal activities. Yes, yes, I think I have also regained from it"* ***(P.2).***

Another participant stated that:

*"I think I'm, in a better shape than when I was using drugs because I was drinking at the same time, you know, alcohol and how it affects your systems so much"* ***(P.1).***

In support of the view expressed by another participant as stated above:

*"The success I had wanted to was to be free from alcoholism, and I am free now"* ***(P.13).***

With regards to social life, participants identified improvement in their social interactions with friends and relatives:

*"Well, for now, I think umm, my life is far better than how I used to be. Because now I can relate more with people that I usually don't get close to".* ***(P.2)***

Another participant stated that:

*"...Socially, I wasn't having much to do with my family as to, going for programmes together and staying around people. I was always either in a ghetto or in my room by myself. But, with recovery, I'm able to relate better"* ***(P.11).***

A participant attributed the success of the rehabilitation programme to his ability to save enough money and make better use of his financial resources:

*"I used to spend most of my monthly income on buying drugs. After visiting the rehabilitation center, I have been able to save more than 3 months of my salary"* ***(P.18).***

Some participants understood that recovering at the rehabilitation center is a journey. For them, although they knew what was wrong with them and were worn out of their addiction, how to stop was a major challenge. As part of this recovery journey, most of the participants understood they have to get better at all costs. The importance of this was to make their families and friends proud and most importantly not to be chastised and ridiculed in society. Although relapse was common among participants, they had hope of recovery. Some participants mentioned the effectiveness of intense education at the facility. A participant stated that:

*"We are made to learn myriad of subjects. The education we receive here has grounded us to live a better life and know more about ourselves* ***(P.12).***

Another participant said that:

*"It has helped me to be grounded. I would single out psycho-education. I'll say a 100 percent yes because having a retrospection of what I went through in my youthful days, what I've lost and today, what I've gained"* ***(P.8).***

#### 4.12.2.2 Quality of rehabilitation

Generally, the quality of rehabilitation was considered fairly good. Many vital aspects were considered relevant in the rehabilitation process by the participants. Notably, provision of basic needs and education were considered in rating the quality of rehabilitation by participants. Basic needs were assessed by participants based on the availability of water, quality of food, bed, and availability of electricity. Although water is available at the rehabilitation centers, inconsistent access remains a challenge. Indeed, they attributed these challenges to the fact that access to services and utilities at the rehabilitation center (Remar Rehabilitation) was free. According to one respondent:

*"Yes, availability of water at Remar Rehab is okay because it's free"* **(P.5).**

Another participant stated that:

*"We are given free accommodation and food better than when I used to stay at my ghetto"* **(F2.4).**

Education was another critical indicator used in assessing the quality of rehabilitation from participants' perspectives. Participants were delighted to mention the depth of understanding and awareness creation experienced whiles in drug rehabilitation. They were introduced to their

condition and most importantly, thought about how to fight and overcome their condition. Some participants said:

*"Yeah. You see, I've been to, rehab before. And umm, I've attempted quitting drugs on my own but never succeeded. This is my 10th time again, 10th but my second rehab. And in here, we are learning about psychoeducation, which is very important…"* **(P.6).**

Another participant said that:

*"…Because if you don't understand your problem, you cannot fight your problem. Here, they'll make you understand your problem. What drug to take, why you are here, what to do about your disease, how to stay in recovery, and how to abstain, and how to watch for triggers, all those things you learn here, in the psychoeducation…* (**P.5).**

*With that, they are helping me a lot. One thing that I've observed which is good is that they are helping us to learn and they sit us down to advise us. They don't allow us to go anywhere. We are just here (P.12).*

# CHAPTER FIVE

# DISCUSSION

## 5.1 Introduction

This chapter discusses the findings of the study concerning recent literature. It discusses the factors such as socio-demographic characteristics, household characteristics, and social and environmental characteristics associated with substance use disorders (SUDs) among youths receiving rehabilitation treatment for SUDs in Ghana. It also focuses on the economic cost associated with rehabilitation from substance use disorders of drug addicts and their families in Ghana. It then describes the experiences of the youth who are in rehabilitation for SUDs in Ghana. Finally, it determines the compliance of drug rehabilitation centres in Ghana to the United Nations Office on Drug and Crime (UNODC) guideline.

## 5.2 Factors Associated with Substance Use Disorders (SUDs) and Rehabilitation among Ghanaian Youth and their families

The factors that influence substance use and SUDs among youths in Ghana's rehabilitation centres are socio-demographic characteristics, household characteristics, and social and environmental characteristics. This study found that socio-demographic characteristics such as sex, age, level of education, employment status, and current residence are associated with SUDs among youths in rehabilitation for SUDs in Ghana. From this study, the proportion of the youth with SUDs were 22.8% among females compared to 77.2% were males. The study found a positive relationship between sex and SUD among youths in Ghana. Males are more addicted to alcohol, nicotine, marijuana and other stimulants than females. (Gallimberti *et al.*, 2015; Narcotics Control Commission Report, 2018). The higher use of substances among males is due to the gender roles

associated with social influences and sensation-seeking behaviours (Birhanu *et al.,* 2014). Gender differences in substance use and addiction are due to socio-cultural, biological and environmental factors (Becker et al., 2019). In patriarchal African societies, including Ghana, the socio-cultural norms mostly frown on substance use by females (Lucia Bird, 2019).

Additionally, females with SUDs experience more stigma than their male counterparts (Becker et al., 2019). This may be a disincentive to females to engage in substance use. There are gender differences in risk appraisal between males and females, with males having higher tendencies to engage in risky behaviours (Moran-Santa Maria et al. 2014; Harris et al., 2020).

However, in the western world, substance use has been equally prevalent among adolescent girls and boys in recent times (Becker et al., 2020). However, in the general population, it is observed that though more males initiate substance use, females tend to progress more rapidly than males from initiation to SUDs (Bobzean et al., 2014). The current finding may be explained by the social repulsion of substance use by females in Ghanaian society. This finding is supported by findings reported by *Global Initiative on Domestic Drug Consumption in Ghana: An under-reported Phenomenon* (Lucia Bird 2019). This current finding can also be explained by the relatively fewer rehabilitation facilities for females with SUDs.

Out of the four rehabilitation centres in Ghana providing drug rehabilitation treatment for persons with SUDs during this research, only one (Pantang Rehabilitation Centre) admits both males and females. The rest are all-male facilities. Although Pantang Drug Rehabilitation Centre is a private institution, it is the only drug rehabilitation facility situated in a public facility. In terms of social support for maintaining abstinence, this study found that males received more social support both

at home and on the job compared to females. Male participants in this study reported that they received better support compared to their female counterparts. This can be explained by the number of drug rehabilitation facilities that admit females with SUDs in Ghana. Additionally, Becker et al. (2019) found that neurobiological sex differences affect substance use behaviour differently for males and females in humans and other mammals. They argued that biological factors that account for sex differences in drug addiction emanate from the brain structure and the hormonal influences on individual behaviour.

Although this study found the highest prevalence of SUDs among persons age 25-29 years and the least among aged 30+ years, these two older age groups had lower SUD odds than age 15-19 years in adjusted models. This inverse relationship between age and SUDs recorded in this study is comparable to evidence from Rhew et al. (2011).

Education was another factor associated with SUDs among Ghanaian youth in the current study. The findings of this study indicated that youth who have some form of education were less likely to use substances and develop SUDs than those who had no form of education. Education plays a key role in understanding and communicating information associated with the well-being of an individual (Yaya et al., 2019). It permits an individual to perceive health better, understand the consequences of substance use and encourage abstinence from abusing drugs (Mahmood et al., 2018).

Thompson (2018) reported that students who had lower grades and youth who later entered school were more likely to be substance users than those who made good grades and attended school appropriately. Arguably, education enlightens individuals on substance use and subsequent SUDs

and their impact on personal life and societal relationships. Some participants in this study reported that they would not have engaged in substance use if properly educated. Education plays a key role in understanding and communicating information associated with the well-being of an individual (Yaya et al., 2019). Higher education enables the youth to learn about alcohol and substance use and how it develops into SUDs (Merianos & Barry, 2017). According to Fothergill *et al.* (2012), school leavers (whether from high school or college or university) were at higher risk of developing drug addiction than those with postgraduate education. The lower SUDs among those with higher education levels is because those with higher education are more enlightened about the consequences of substance use and SUDs on the personal life and societal relationships.

Students exposed to educational training modules had reduced alcohol intake significantly compared to those who had not been privy to the education provided by the other group (Merianos & Barry, 2017). In this study, participants expressed regret over the current state of their lives, which resulted from their substance use. Study by Mahmood et al., 2018 reported health education promotes abstinence from substance use. When students are provided with the right information, they are guided in making beneficial decisions about their lives. This reduces their engagement in substance use and eventually reduces the incidence of SUDs among the youth. Mahmood et al. reported that students were better equipped with knowledge after a successful drug education programme. The education prevented them from falling prey to peers who would have influenced them to substance use (Mahmood et al., 2018).

This study found a positive relationship between having any friend who uses substances and SUD among youths in the rehabilitation centres for SUDs in Ghana. Some of the participants in this study reported their peers influenced them into substance use and subsequent SUDs. Gudonis-

Miller et al. (2012) reported that peer groups are positively associated with substance use and consequent SUDs.

Employment, which constitutes a huge part of the daily life of people, offers structure, a social support network, and role identity (Degroote et al., 2014). However, unemployment leads to financial instability, thus creating anxiety or insecurity for the youth or middle-aged adults who are expected to be the most productive and contributively age group to family economics (Feng et al., 2015). This study found an association between unemployment status and SUD among youths in the rehabilitation centres for SUDs in Ghana. According to Teixidó-Compañó et al. (2018), being unemployed is associated with higher cannabis use and consumption of addictive substances. This is because unemployed youths are mostly faced with stressful situations such as the inability to afford basic life needs, which leads to psychological problems such as stress and anxiety. These psychological problems are associated with SUDs (Mohamed et al., 2020). Hence, it is important for a policy direction towards job creation to prevent youth from engaging in substance use and SUDs.

This study found that household characteristics such as family size, the person lived with until age 15, live status of the father, father's highest educational status and live status of mother have an association with SUD among youths in the rehabilitation centres for SUDs in Ghana.

This study found that SUDs was significantly associated with a negative relationship with the caregiver and not living with both parents (either due to physical separation or death) before age 15.

Qualitative accounts in this study revealed that participants' blamed their substance use for the period of their lives when they lost their mothers as young persons. (Mahmood et al., 2018).

Youth who had deceased mothers were more likely to develop SUDs than youth who had mothers alive. In another study by (Hamdan et al. 2017), it was reported that bereaved youths are most likely to contribute to the rising numbers of SUDs. This is because of the loss of financial stability, shock, depression and posttraumatic stress disorder (PTSD) associated with the loss of a parent, much more the loss of a mother. Further, it was found that husbands who lost their wives become burdened with depression and PTSD themselves, leaving their children on their own. This results in less monitoring of the children, and subsequent neglect in catering lead to substance use and SUD (Hamdan et al., 2017). Contrary to these findings, however, a study by (Brent et al., 2015) reported that youth who lost their mothers at a younger age only tend to be affected within a year of the loss and are recovered afterwards, thus offering a rebuttal of the fact that SUD is as a result of the youth grieving their deceased mother.

Furthermore, Lander et al. (2018) reported that youths who stayed with both parents up to fifteen years of age were less likely to become substance users than those who stayed with only their mothers to the same age. It is noteworthy that the family system is the most important part of any society. It has been described as the primary means of socialization and nurturing individuals in any society. Parents play an essential role in the lives of their children, serving as role models to them in a variety of ways (Kabore et al., 2019).

However, there is evidence that families recording high substance use may also impose negative outcomes for youth due to the enabling environment for substance use. Change in one family member affects change in the other members, resulting in complete abstinence from or substance use behaviours leading to SUDs (Brent et al., 2015). For instance, a drunkard father might suggest

that his son go sober to take a few sips of alcohol with him, and the one-time offer might result in a cascade of future invitations, and both of them may never get out alcoholism.

This study found that social and environmental characteristics such as control over when and where one goes at night, control over whether or not one uses a substance, and having any friend who uses a substance has an association with SUD among youths in the rehabilitation centres SUDs in Ghana.

According to the findings of this study, it was observed that staying with one's partner significantly reduced the possibility of becoming addicted to substances and SUDs. This finding can be explained by the fact that several factors are related to having a partner that secures a healthy relationship. Sexuality forms a huge part of sexual relationships. A research carried out by the University of Granada reported that even after going through phases of rehabilitation, persons with SUDs tend to become sexually impotent (University of Granada, 2013). When individuals are caught up in SUDs, it affects their social and family support, leading to a drop in habit due to isolation. Pettersen et al. (2019) found that Persons with SUDs who were undergoing rehabilitation advocated for positive social networks around them, care and protection from engaging in negative attitudes which affect their relationship with significant others. In this study, some participants reported that their mothers, wives and partners proved to be of immense help and support throughout their rehabilitation process. This proves the positive impact of partners on the persons with SUD, as this study discovered. One participant reported that his partner noticed he was abusing substances and immediately reported to his family, who sought rehabilitation treatment for him. Angulski et al. (2018) found that individuals in committed relationships were less likely to use substances than those with their partners for the fun of it. This means that where partners

received support, they were less likely to develop SUDs. Gudonis-Miller et al., also reported a significant decrease in the use of marijuana in committed relationships (Gudonis-Miller et al.).

Consequently, when an individual is a non-substance user, the partner tends to reduce their use of substances. This study found a positive association between rural residence and SUD among youths in the rehabilitation centres for SUDs in Ghana. This can be explained that although the drug rehabilitation facilities in Ghana are all situated in urban areas, the majority of persons with SUDs who were receiving treatment at the various facilities during the period of this study had their roots from the rural areas. It can also be explained that the elite families in urban areas with people with SUDs may not patronise drug rehabilitation services due to stigma and the quality of drug rehabilitation services in Ghana. This study observed that since all the drug rehabilitation centres, except Pantang Drug Rehabilitation, were Christian faith-based, their treatment models were founded on the Christian faith. Therefore, when persons with SUDs complete their rehabilitation treatment, they find it convenient and lucrative to roll into pastoral activities and remain in urban areas. Rhew et al. (2011) found that youths who live in rural areas were more likely to be substance users and SUDs than those in urban areas. This may result from rural dwellers being stressed due to the non-availability of job opportunities (Pateman, 2011).

The study discovered that being a rural dweller was associated with a higher risk of SUDs than being an urban dweller. Similarly, Rhew et al. (2011) reported that youth who lived on farms in rural areas were more likely to be addicted to illicit substances than those in towns. These findings can be explained that rural dwellers may be stressed due to the non-availability of job opportunities. To corroborate this finding, Pateman reported fewer jobs for human resources in rural England than in urban areas (Pateman 2015). Additionally, Pateman compared substance use

among middle school and high school rural dwellers. The study reported a high incidence of SUDs and explained it to be due to increased responsibility at school and home (Pateman 2015).

As children advance towards adolescence, including while they are adolescence, the frequency of their use of substances increases (Gallimberti et al., 2015). They explained that the transition from childhood to adolescence is marked with a great deal of influence from peers Gallimberti et al., 2015). Contrary to these findings, however, Rhew et al. (2011) reported reduced incidence of substance and SUDs among adolescents exposed to drug education and prevention. Given these findings, prevention programmes and empowering adolescents to focus on activities, which keep them from substance use, should be intensified. Further, Koechl et al. reported different findings from the results of this study. Koechl et al. reported that substance use and SUDs have no age limits. They projected that treatment for substance use and SUDs would increase by as much as 300% by 2020 (Koechl et al., 2012). SUDs have been reported among adolescents, young adults and the elderly, specifically between 15 – 64 years, and even as old as 86 years (Koechl et al., 2012). The increased incidence of substance use with increasing age has been attributed to lack of support and isolation with advancing age, coupled with deteriorating health and loss of a partner (Koechl et al., 2012).

In examining the social and environmental factors, parental/guardian relationship with youth and sale of hard drugs in the vicinity were considered. The study's findings reported that youth who lived with very strict parents/guardians were more likely to be substance users than those who had parents who afforded their wards normal restrictions. This contradicts findings from a cross-sectional study by Shakya et al., which reported that authoritative parenting was associated with a reduced incidence of substance use and child delinquency (Shakya et al., 2012). In defining

authoritative parenting, the study reported that such parents are "warm and communicative, but they also exert appropriate control" (Shakya et al, 2012). This explains why lower levels of substance use were documented among children of authoritative parents.

Consequently, it has been reported that youth who have authoritative parents do not also belong to delinquent peer groups (Shakya et al., 2012). Regarding this study, the finding can be explained to be from the fact that is refusing them normal restrictions, children of strict parents tend to be curious and end up indulging in vices as influenced by their peers. In this study, some participants were noted to have reported curiosity as the reason behind their initial substance use and subsequent SUDs.

For youth who had a kind of confronting relationship with their parents/guardians, the study recorded that they were more likely to use substances and develop SUDs. Relationships are noted to be the basic form of communication that creates an indestructible bond among family members (Lander et al., 2013). Consequently, it has been documented that youth in families characterized by regular conflicts are more likely to become substance users (Rhew et al., 2011). Such youth tend to associate themselves with friends to take their minds off their family conflicts. They may become rebellious to their parents and perform poorly in school. These factors have been established to be related to increased levels of substance and SUDs among the youth (Rhew et al., 2011). Shakya et al. described such a family setting as having authoritarian parenting (Shakya et al., 2012). As opposed to authoritative parents, authoritarian parents have been described as being such who "exert control while lacking warmth" (Shakya et al., 2012).

In familial relationships where youth were noted to have strong family ties, it was observed that the likelihood of becoming a substance user was reduced. Recent family structures tend to comprise nuclear family structures and predominantly single-parent families (Centre for Substance Abuse Treatment, 2014). Children tend to be attached to their parents when they are with them. The nuclear family system and some single-parenting systems offer these benefits. Lander et al. explained that children tend to be attached to their parents as they advance towards their youthful years. They reported that a poor attachment system results in anxiety and depression in youthful years lead to substance use and SUDs (Lander et al., 2013). The effect of SUDs is experienced by the entire family, which strains the family ties that existed previously. Thus, strong family ties are protective against substance use and SUDs among youth. Some participants in this study blamed their substance and SUDs as victims of broken homes. Broken homes leave children poorly catered for and poorly supervised. Coupled with curiosity from the lack of supervision, the youth become substance users.

The current finding is supported by earlier evidence from Ghana, which showed that substances could be obtained at low prices in communities where they are sold (Kabore et al., 2019). Thus, increasing access to youth in the community. Furthermore, the evidence by Kabore et al. 2019 showed that adolescents from poor homes use the sale of drugs as a means for upkeep in these communities. Phillips (2012) found that adolescents who engaged in illicit drug business were reported to also engage in other social vices, including robbery, rape and other forms of violence. There were two sides to every town: There is always a place where illicit drugs are sold, and many know and patronise these areas (Draus & Carlson 2013). Persons with SUDs were themselves the sellers of the substances, and as a means of making money to get more substances, engage in the

sales (Draus & Carlson 2013. This study showed that youths were aware of places where substances were sold in their vicinity, hence their easy access and use.

### 5.2 Economic cost associated with drug rehabilitation on persons with SUDs and their families

The study sought to examine the economic cost of drug rehabilitation on persons with SUDs and their families in Ghana. The estimate on treatment cost regarding drug rehabilitation is remarkable to guide programme assessments and reimbursement decisions. The direct cost for rehabilitation was approximately GHS 190,047 ($32,807.7) in the present study. The direct cost comprised medical cost, estimated at GHS 165,591 ($28,585.87), and the non-medical cost was GHS 24,456 ($4,221.82). In 2016, the United States estimated the economic loss of substance use (direct and indirect cost) to be $578 billion. The cost of SUDs was $11,600 per user (Recovery Centers of America, 2016). However, this study reported that a patient averagely spent GHS 15 88.6 ($274.24) as a direct cost on rehabilitation, of which medical cost constitutes approximately 74.4%.

In contrast, non-medical cost covers 11% of all cost of the total cost. The economic cost of drug rehabilitation indicated in this study was lower than that of the United States. The differences observed in economic loss may be due to the fact that this study used data from localized rehabilitation centres located in Ghana and hence not generalizable compared to data from the United States. The current information on economic loss associated with SUD rehabilitation in Ghana, especially among the vulnerable population, such as adolescents and youth, are unique and have not been studied. Most adolescents and young adults are not financially capable of making payments for their treatment, increasing the economic burden on their families. A research by

Adzrago et al. (2018) revealed that service providers in rehabilitation centres in the Central Region of Ghana affirmed that rehabilitation services were expensive and that the National Health Insurance Scheme (NHIS) does not cover SUDs but only covers minor sicknesses and ailments, including but not limited to cases of malaria, stomach aches, and headaches (Adzrago & Adu-Gyamfi, 2018). The total indirect cost was GHS 32 396.5 ($5,592.59), representing 14.6% of the total cost of rehabilitation.

The total productivity loss regarding patients and accompanying relatives was GHS 217, 904 ($37,616.64) and GHS 4,539.5 ($783.65), respectively. Estimated cost relative to the patient was grouped; days lost for being absent from work, time spent travelling to and from the health facility and waiting before being called to see a Doctor or Healthcare Officer for treatment. The estimated cost was high for days lost for being absent from work GHS 14, 829 ($2,559.92), representing 6.7% of SUD rehabilitation cost.

Costs of time spent travelling to and from the health facility and time spent waiting before being called to see a Doctor or Healthcare Officer for treatment were estimated at GHS 8, 377 ($1,446.12) and GHS 4, 651 ($802.90), respectively. Sex differences are present for all phases of substance use and development of SUDs (initiation, escalation of use, addiction, and relapse following abstinence). The rates of substance use were currently lower in women than in men. In addition, females self-administer substance use at lower doses than males (Becker & Hu, 2014). This study also found sex differences in the total mean cost for rehabilitation for males and females for the minimum period of six months. The total mean cost for rehabilitation per male (GHS 2615.8) ($451.56) was higher compared to that of a female (GHS 1781.1) ($307.47). The high cost of rehabilitation among men could result from high doses administered, which could lead to

increased SUDs and hence requires more medications for treatment and prolonged days of stay at the rehabilitation centre.

In this study, geographical differences were observed regarding the total mean cost for patients receiving rehabilitation treatment for SUDs in urban and rural settings. The total mean cost for patients in the urban areas (GHS 3338.2) ($567.27) was higher compared to those in the rural areas (GHS 1492.9) ($257.72). A study showed that persons with SUDs and their families in rural areas were less likely to seek treatment than those in urban settings. Warner and Leukefeld (2011) reported similar findings.

William and Holmes (2018) found that rural residents with SUDs were more likely to have lower incomes and less likely to seek treatment. The low patronage of rehabilitation treatment by persons with SUDs found in this study could be attributed to the high cost of rehabilitation treatment, resulting in low health-seeking behaviours among the rural residents. Also, it could be due to the availability of substandard health services at the rural level hence lesser cost in receiving alternative treatment for SUDs. There is, therefore, the need to educate rural residents on the need to seek standard rehabilitation treatment for SUDs. SUDs induce mental health disorders and vice versa (Ross & Peselow, 2012).

Individuals who develop SUDs were also diagnosed with mental disorders and vice versa (Kelly & Daley, 2013). Evidence from multiple national population surveys reported that about half of those who experience mental illness during their lives were more likely also to experience SUDs (Ross & Peselow, 2012; Kelly & Daley, 2013). This study reported that 38.3% of the participants had mild to moderate intangible burdens (Depression, Anxiety and Stress) due to SUDs. Little or

no burden (30.8%), moderate to severe burden (29.2%) and severe burden (1.7%) was prevalent among the participants. The results from the research indicated that adolescents in the United States with substance use disorders also have high rates of co-occurring mental illness; thus, over 60 percent of adolescents in community-based substance use disorder treatment programmes also meet diagnostic criteria for another mental illness (Hser et al., 2020). The study found an association between sex, age, residential status, employment and intangible burden due to drug addiction.

### 5.3 Experiences of youth with SUDs in drug rehabilitation and their families

This study explored the experiences of the youth in rehabilitation centres in Ghana through focus groups discussions. for SUDs and identified the drivers of SUDs. The study identified five sub-themes: peer influence, loss of loved ones, curiosity, broken home, and pain and anxiety. Fourteen participants attributed drug addition to peer pressure. Youths are identified to be influenced by peers to engage in substance use. Peer groups are positively associated with drug abuse and consequent addiction. (Gudonis-Miller et al., 2012).

The participants reported that being in drug rehabilitation had improved their orientation on financial stability. In the sense that they would now be able to keep jobs, save money and improve their financial status. This could be explained because monies would no longer be channeled to purchasing substances but for self-improvement and investment. The participants also reported that the rehabilitation process had helped them have a better perspective of their lives. They promised to be responsible persons, cater to their families, and not burden them with economic costs any longer.

Additionally, participants reported that their social lives had improved positively from the drug rehabilitation programme. Most of the participants reported that rehabilitation was stressful, especially at the early stages when they were first admitted into the programme. (Pettersen et al., 2018) found that persons with SUDs reported suffering from poor quality of life, lack of self-control, experiencing shame and stigma, as well as family neglect. Participants in this study reported that drug rehabilitation had shaped their social skills and enhanced their relationships with their families and friends. (Kaskutas et al., 2014) found that persons with SUDs reported fully recovered from their SUDs after five years of staying away from substance use and rehabilitation.

Apart from the influence of family and friends in the recovery process, persons with SUDs reported to have recovered based on decisions at personal growth, improving self-care, and developing a concern for others (Kaskutas et al., 2014). In this study, participants reported the quality of the rehabilitation process to include fairly good food provided them with the rehabilitation managements, engagement in recreational activities, psycho-education on the effects of substance use and its disorders, provision of their basic needs, and periodic counselling. These factors could be argued to have contributed to the success of the drug rehabilitation programme. Participants reported such benefits as learning, both formally and informally, and getting an improved orientation on their previous ways of life.

The success of drug rehabilitation programmes for persons with SUDs was multi-faceted. In this study, participants were noted to have appreciated the fact that "recovery is a journey. Prangley et al. (2018) noted five themes for successful recovery of SUDs, namely "improved understanding of substance uses and SUD status, reduced substance use, improved physical and psychological health, relationship success and employment success". The findings of this study resonate with the

findings of (Prangley et al., 2018) with the perceived success of drug rehabilitation as reported by the participants of this study.

### 5.4 Compliance of Drug rehabilitation Centres in Ghana to UNODC Guidelines

The quality of rehabilitation services utilized by SUDs plays a significant role in their total recovery (National Institute on Drug Abuse, 2018). This study, therefore, sought to determine the compliance of drug rehabilitation centres in Ghana to the United Nations Office on Drug and Crime (UNODC) guideline. In this study, the mean score of the domain on the availability and accessibility of drug dependence treatment were significantly lower in all the four-drug rehabilitation centres than the UNODC standard mean. In ensuring the availability and accessibility of drug dependence treatment, it is expected that persons with SUDs should have access to a diverse range of treatment services that address their needs.

Also, factors such as affordability, geographical accessibility, timeliness and flexibility of opening hours, user-friendliness, and responsiveness to the needs of individuals should contribute to the accessibility of drug dependence treatment (Saenz et al., 2012). A study carried out by Friedmann et al. in the United States of America (USA) found an increase in the timely provision of treatment. However, there was some level of discrimination towards indigenes with SUDs and those in methadone maintenance treatment programmes (Friedmann et al., 2013). In Ghana, Adzrago et al. (2018) findings from the Central region also reported that rehabilitation services were not available and accessible.

A report by the World Health Organization (WHO) stated that most countries in Sub-Saharan Africa have limited rehabilitation programmes, which are often ineffective due to unavailability

and poor access to treatment services (WHO, 2017). The challenge with the availability and accessibility of drug rehabilitation as found in this study could be attributed to existing challenges facing most resource-limited settings, of which Ghana is not excluded. There is a need for national policy to address these issues. Flora and Stalikas (2012) established that positive and negative factors associated with drug rehabilitation processes affect rehabilitating persons with SUDs, which influences clients' level of compliance with rehabilitation services and providers and recovery from SUDs. This study found that the mean scores on treatment as an alternative to prison and in prison settings were significantly lower than threshold mean scores in two of the drug rehabilitation centres. The possession and use of narcotic substances, including cannabis, cocaine and heroin, is a crime in Ghana.

However, since SUDs are associated with health conditions, the ideal setting for treating persons with SUDs is the healthcare system rather than the criminal justice system. The healthcare system as the preferred environment for managing substance use and SUDs related treatment needs to be developed to meet Ghana's ever-increasing need for drug rehabilitation services. In agreement with this, Sumnall et al. (2017) found that substance use treatment as an alternative to incarceration has double benefits for reducing suffering and disability and reducing crime.

Evidence has shown that drug treatment services for persons with SUDs in correctional settings helped curb re-offense, provided the programme has a full benefit such as competent and committed staff, support of correctional authorities, adequate resources, comprehensive, intensive course of therapy aimed at affecting the lifestyles of the persons with SUDs beyond their substance use problems, and continuity of care after inmates are paroled. Alternative treatment such as psychoeducation proved to positively affect the lifestyles of the prisoners with SUDs (Gerstein &

Harwood, 2012). The UNODC standard guideline suggests alternative treatment settings for prisoners. Drug treatment services benefit persons with SUDs in the criminal justice system (Inciardi et al., 2007; Pearson & Lipton, 2009). In the prison setting, behavioural treatment approaches were used to address SUDs.

Evidence-based behavioural interventions include cognitive behavioural therapies (CBT) that teach coping and decision-making skills (Wormith et al., 2012). Effective interventions at prison depend on a coordinated response between criminal justice agencies, drug rehabilitation providers, mental health and physical healthcare organizations, and social service agencies (Chandler et al., 2017). The low mean score of treatment as an alternative to prison and in prison settings, as found in this study, could be attributed to the fact that there are limited resources and structures at the national level (policies and guidelines) to provide such alternative care for persons with SUDs in prison. Therefore, there is the need for the government through its policy implementation agencies, including the Ministry of Health and the Narcotics Control Commission to consider and design appropriate interventions to strengthen drug rehabilitation facilities in Ghana to provide adequate and enhanced drug addiction treatment for persons with SUDs. This will improve the outcomes of substance use and SUDs on health and the family and the social systems.

Clinical governance was found to be the highest domain for two rehabilitation centres. The results showed varied domain strengths of the drug rehabilitation facilities because they use different modalities and approaches. Regarding accountable and efficient clinical governance systems, it requires the existence of written policies and protocols and through mechanisms for monitoring and supervision by qualified staff. In addition, systems for accreditation, certification and quality assurance for drug treatment services need to be in place (Sumnall et al., 2017). In Ghana, there is

a written drug policy, which seeks to improve people's health, safety, security, and socio-economic well-being by reducing substance use, substance use-related harms, illicit drug trafficking, and associated crimes. These steps are in synchronization with the three international drug control conventions as well as other UN resolutions and commitments to address substance use and possession, including the United Nations General Assembly Special Session on Drugs (UNGASS 2016).

Outcome Document agreed to by the International Communities in 2016 (Jelsma, 2016; Sischy & Blaustein, 2018; Ghana National Drug Policy (GNDP, 2004). The reason for the highest mean score for the clinical governance domain as found in this study could be attributed to the fact that the existing health system of Ghana is well structured and has a functional Ministry of Health that regulates all health activities within the country. The Ministry of Health ensures that drug rehabilitation facilities are accredited, work with written policies and protocols, monitor and offer quality services (GNDP, 2018). In Remar Drug Rehabilitation Centre, the study found the lowest domain to be screening, assessment, diagnosis and treatment planning. In ensuring a comprehensive diagnostic assessment process, there is the need for screening for SUDs and associated risk behaviours, assessment and diagnosis of drug dependence and comorbid mental illnesses, comprehensive assessment for stage and severity of illness, temperament, personality and employment status and an individualized treatment plan (Sumnall et al., 2017).

Generally, there is a limited standardized approach to screening, assessment and outcome measurement in the substance use sector. Hence, various tools are used, some of which are empirically established instruments whilst others are purpose-built, internally designed tools with increased practicality and utility but unknown validity and reliability (Roche & Pollard, 2016;

UNODC, 2016; Ghana Narcotics Control Commission, 2018). The lowest domain for Remar Drug Rehabilitation Centre were screening, assessment, diagnosis and treatment planning. This could be attributed to the Remar Drug Rehabilitation Centre, a Non-Governmental Organization (NGO) drug rehabilitation facility situated outside the capital city of Ghana, and uses its modalities for admission and treatment. This could pose a challenge in limiting screening, assessment, diagnosis, and treatment planning resources. Therefore, there is the need for the government through the Ministry of Health and other stakeholders to supervise, assess, and allocate resources to strengthen screening, assessment, diagnosis, treatment planning and general service provision.

### 5.5 Strengths of the study

1. This study provides evidence on the factors associated with SUDs and describes experiences of youths in rehabilitation treatment.
2. Information on economic cost associated with SUDs rehabilitation in Ghana will makes it useful for policy planning and implementation.
3. At the time of this study, there were no case-control studies on youths with substance use disorders in the drug rehabilitation centres in Ghana. A dearth of studies was conducted on youth with substance use disorders globally, and this study fills these identified gaps.
4. This is also the first mixed method design study on youth with substance use disorders in Ghana and among a few that were identified globally. Therefore, it is hoped that this study will provide insights into developing a comprehensive multisectoral approach for youths with substance use disorders.
5. The study is the first to estimate the economic cost of rehabilitation from substance use disorders on drug addicts and their families in Ghana.

6. It is also the first in Ghana to compare the compliance of drug rehabilitation centres in Ghana to the United Nations Office on Drug and Crime (UNODC) guideline.

### 5.6 Limitations

1. It was impossible to blind researchers and research assistants to cases and controls due to the institutionalization of youth with SUDs. Thus, introducing the possibility of observer bias. Nevertheless, efforts were made to curb this. Each interview was approached with openness, neutrality and a nonjudgmental attitude.

2. This study involved youths with SUDs admitted into drug rehabilitation centres in Ghana. These youths may have very different characteristics compared to those with SUDs not yet admitted into drug rehabilitation centres. Thus, the findings of this study may not fully represent all youths with SUDs in Ghana.

3. There was the possibility of respondent bias which may result in inaccuracies in the participants' responses.

4. There was a possibility of over-reporting by participants due to participants' biased recall of certain events in the past, thus recall bias.

### 5.7 Contributions to knowledge

By exploring the life experiences of the youth with substance use disorders receiving treatment for SUDs at the selected drug rehabilitation centres in Ghana, this study has provided evidence on the lived experiences of youth with SUDs in rehabilitation and identified social and environmental factors associated with SUDs. Therefore, this study has contributed evidence necessary to inform the development of preventive strategies aimed at preventing the engagement of the youth in substance use at both the adolescent and young age.

Secondly, the case-control design with a quantitative inquiry assessed substance use disorders among the youth in a novel way. This has led to evidence on the household characteristics and social and environmental characteristics associated with youth substance use disorders.

Uniquely, the study has provided an in-depth account of the youth with SUDs receiving treatment for SUDs at drug rehabilitation centres in Ghana.

This study provides information on current economic cost of SUDs rehabilitation in Ghana. The study provided information on the compliance of drug rehabilitation centres in Ghana to the United Nations Office on Drug and Crime (UNODC) guidelines by the four rehabilitation centres studied in Ghana.

# CHAPTER SIX

# CONCLUSION AND RECOMMENDATIONS

## 6.1 Conclusion

The study concludes that socio-demographic characteristics such as sex, age, employment status, current residence and household characteristics such as family size, the person lived with until age 15, life status of the father, father's highest educational status, and life status of the mother were associated with SUDs among the youth who were receiving treatment for SUDs in selected rehabilitation centres in Ghana. Also, the study concludes that social and environmental characteristics such as control over when and where one goes at night, control over whether or not one uses substances, and had any friend who uses substances were associated with SUDs among the youth who were receiving treatment for SUDs in selected rehabilitation centres in Ghana. The study concludes that there was a high economic cost associated with drug rehabilitation from SUDs on youths with SUDs and their families in Ghana. The study also concludes that the overall compliance of drug rehabilitation centres in Ghana to the United Nations Office on Drug and Crime (UNODC) guideline was generally low.

## 6.2 Recommendations

**The following recommendations are made:**

1. For substance use prevention strategies, the government must target all populations, but more importantly, males, rural dwellers, and older populations who have higher odds of substance use.
2. To reduce the burden associated with the rehabilitation of substances and SUDs, the government through the Ministry of health and other stakeholders like Narcotic Control

Commission must subsidize rehabilitation registration costs, contributing more than half of the economic burden of drug rehabilitation.

3. The government, through the Ministry of Health, Ghana Health Service as well as other key stakeholders like the Narcotic Control Commission, must allocate resources to strengthen screening, assessment, diagnosis and treatment planning at the various drug rehabilitation centres, particularly in Remar rehabilitation centre and for the emerging drug rehabilitation centres in Ghana

4. The Narcotic Control Commission must ensure proper monitoring and supervision of the drug rehabilitation centres in Ghana, in compliance with UNODC standards.

5. Through the Ministry of Education, the Ministry of Health, the Ghana Health Service and Narcotics Control Commission, the government of Ghana should initiate comprehensive educative and sensitization programmes on effects of substance use, targeted at high-risk populations (i.e. males, rural dwellers and older population). This can rely on public health structures at district and sub-district levels and include school health talks, community outreach programmes, church health talks etc.

6. Through its agencies and stakeholders, the government should encourage and motivate individuals, especially the youth, to report criminal activities, including illicit drug activities, to the law enforcement agencies. This can be done by creating specialized youth groups with training in intelligence and security at all educational and vocational institutions in Ghana.

7. The government, through its agencies, including the Ministry of Health, Narcotics Control Commission and Social Welfare, should ensure enhanced evaluation of the drug rehabilitation centres in Ghana and provide technical support for them. This will help improve drug rehabilitation services in Ghana to meet the United Nations (UNODC) standards.

8. The parents of the adolescent should increase their attachment with the adolescent to prevent them from being influenced by peers negatively and also, they can freely communicate with their parents.

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# APPENDIX-I (QUESTIONNAIRE)

Questionnaire number……

| | SOCIO-DEMOGRAPHIC FACTORS | |
|---|---|---|
| **No.** | **Variable (Definition)** | **Response** |
| **1.** | Case status? | 0. Control<br>1. Case |
| **2.** | Sex of respondent | 1. Female<br>2. Male |
| **3.** | How old were you on your last birthday | …… |
| **4.** | How old were you when you first did drugs? | …… |
| **5.** | Highest level of education | 1. None<br>2. Basic (Primary/JHS/JSS)<br>3. Secondary<br>4. Tertiary |
| **6.** | Family size (Mother, Father and siblings) | …… |
| **7.** | Father | 1. Dead<br>2. Alive |
| **8.** | Father's educational level | 1. None<br>2. Basic (Primary/JHS/JSS)<br>3. Secondary<br>4. Tertiary |
| **9.** | Mother | 1. Dead<br>2. Alive |
| **10.** | Mother's educational level | 1. None<br>2. Basic (Primary/JHS/JSS)<br>3. Secondary<br>4. Tertiary |
| **11.** | How was/is your parents economic status | 1. Rich<br>2. Middle income<br>3. Poor |
| **12.** | For the past 12 months, where have you been living mostly | 1. Rural<br>2. Urban |
| **13.** | Where do you currently reside? | 1. Rural<br>2. Urban |
| **14.** | Religious affiliation | 1. None<br>2. Traditionalist<br>3. Christian<br>4. Muslim |

| | | |
|---|---|---|
| | | 5. Other …… |
| **15.** | How often do you participate in religious activities in past 12 months? | 1. Once a week or more<br>2. Once a month or more but less than once a week<br>3. Several times but less than Once a month<br>4. Did not attend /participate in any |
| **16.** | Did you receive money from any of the following during the last 30 days? | 1. Salary/Wage from legitimate job<br>2. Public assistance/Charity<br>3. Spouse/Family<br>4. Friends |
| **17.** | Whom were you living mostly with until age 15 years | 1. Both Parents<br>2. Mother only<br>3. Father only<br>4. Grandparent<br>5. Other relatives<br>6. Other…… |
| **18.** | Whom have you been currently living with | 1. Both Parents<br>2. Mother only<br>3. Father only<br>4. Grandparent/other relatives<br>5. Friends<br>6. Alone<br>7. Partner<br>8. Other…… |
| **19.** | Number of Children (Clients) | …… |
| **20.** | Employment status | 1. Student<br>2. Employed<br>3. Unemployed<br>4. Other …… |
| **21.** | Marital Status | 1. Single<br>2. Cohabiting<br>3. Married<br>4. Divorced |

| | | |
|---|---|---|
| | | 5. Other ..... |
| | **SOCIAL AND ENVIRONMENTAL FACTORS** | |
| **22.** | **Do your (parents/wife/husband) have any real control over the following aspects of your life** | |
| | (a) When and where you go at night | 1. No 2. Yes |
| | (b) What friends you keep | 1. No 2. Yes |
| | (c) Whether or not you use drugs | 1. No 2. Yes |
| | (d) Whether or not you go to work or school | 1. No 2. Yes |
| | (e) Whether or not you drink alcoholic beverages | 1. No 2. Yes |
| | (f) How you spend your money | 1. No 2. Yes |
| **23.** | Strictness of guardian | 1. Extremely Strict<br>2. Normal<br>3. Not strict |
| **24.** | What is your relationship with your parents | 1. Warm<br>2. Good<br>3. Confronting |
| **25.** | Strength of family ties | 1. Strong<br>2. Moderate<br>3. Weak |
| **26.** | Does any of your close family members use drug? E.g. Alcohol, Cannabis, Cocaine, heroin etc. | 1 No 2. Yes |
| **27.** | How much of your free time do you normally spend with your close family members? | 1. None<br>2. Less than half<br>3. About half<br>4. Almost all |
| **28.** | How many of your close friends use drugs? | 1. None<br>2. Less than half<br>3. About half<br>4. Almost all |
| **29.** | How often do you meet your close friends who use drugs? | 1. Almost everyday<br>2. 2 – 5 times a week<br>3. About once a week<br>4. 2 – 3 times a month<br>5. Once a month<br>6. Never |
| **30.** | Where do you normally meet your friends who do drugs | 1. Never meet them<br>2. Home<br>3. School<br>4. Work place<br>5. Social club/events<br>6. Night clubs/bar/Parks<br>7. Other..... |
| **31.** | Do you have any area in your vicinity where they trade hard drugs? | 1. No 2. Yes |

| | | |
|---|---|---|
| | **FOR (CASES) RECOVERING ADDICTS ONLY** | |
| **32.** | What is the name of the drug you used for the 1st time? | 1. Alcohol<br>2. Marijuana/Cannabis (wee)<br>3. cocaine<br>4. Heroin<br>5. Opium<br>6. LSD<br>7. Cocktail<br>8. Others<br>…… |
| **33.** | At what age did you used drugs for the 1st time? | …… |
| **34.** | What was the last drug you used?<br>(you can answer more than one item) | 1. Alcohol<br>2. Marijuana/Cannabis (wee)<br>3. cocaine<br>4. Heroin<br>5. Opium<br>6. LSD<br>7. Cocktail<br>8. Others |
| **35.** | How easy was it to get the drug of choice? | 1. Very easy<br>2. Easy<br>3. Difficult |
| **36.** | How did you use the drug? (Mode of transmission) | 1. Sniff (via nose)<br>2. Smoke (like cigarette)<br>3. Oral<br>4. Injection<br>5. Others…… |
| **37.** | How often did you use drugs? | 1. Once a day<br>2. More than once a day<br>3. Once a week<br>4. Several times a week<br>5. Other<br>…… |
| **38.** | Did you use drug alone or in group? | 1. Alone 2. Group |
| **39.** | On the average, how much did you spend on drugs in a week? | GhC<br>…… |
| | **DRUG PROBLEMS** | |
| **40** | **Do your (parents/wife/husband) have any real control over the following aspects of your life?** | |
| | (a) Performance at work or school | 1. No 2. Yes |
| | (b) Drug abuse | 1. No 2. Yes |

| | | | |
|---|---|---|---|
| | (c) Finances | 1. No | 2. Yes |
| | (d) Health issues | 1. No | 2. Yes |
| | (e) Sexually life | 1. No | 2. Yes |
| | (f) Social life | 1. No | 2. Yes |
| **41** | Do you think your parents/relatives/friend feel ashamed of your actions of drugs abuse? | 1. No | 2. Yes |

| ECONOMIC COST RELATED QUESTIONS | | |
|---|---|---|
| | **DIRECT COST INFORMATION** | |
| 42 | ***Medical cost:***<br>How much did you spend/pay in the last month for: | GH₵ |
| | (a) Registration | ……… |
| | (b) Consultation | ……… |
| | (c) Laboratory & other diagnostic tests | ……… |
| | (d) Medicines/drugs | ……… |
| | (e) Surgery | ……… |
| 43 | How much did you pay for your last tool test? | GH₵ |
| | (a) Cost of using specific tool1 | ……… |
| | (b) Cost of using specific tool2 | ……… |
| 44 | ***Non-medical cost:***<br>How much did you spend/paid (you and accompanying relative) on: | GH₵ |
| | (a) Travel cost (to and fro the facility) | ……… |
| | (b) Food cost | ……… |
| | (c) Drinks/water cost | ……… |

| | | |
|---|---|---|
| 45 | Other miscellaneous costs (i.e. phone calls/ phone credits used due to this illness) | ……… |
| 46 | Did you rely on financial help from other source(s) for treatment, apart from normal income? | 1. No 2. Yes |
| 47 | What are the sources (multiple responses possible)? | 1. Relative<br>2. Friend<br>3. Savings<br>4. Loan/Grant<br>5. Other (Specify)<br>6. Not applicable |
| 48 | How much money did you receive from the identified source(s)? | GhȻ<br>…… |
| 49 | Do you often skip treatment because of cost of treatment? | 1. No 2. Yes |
| | **INDIRECT COST INFORMATION.** | |
| 50 | How many days have you been absent from work apart from the time you spent travelling and the time you spent at the hospital (if applicable) in the last month because of your illness (i.e. treatment, recovery)? | ……<br>Days |
| 51 | How many minutes did you spend travelling to and from the health facility? | ……<br>Mins. |
| 52 | How many minutes did you spend waiting before you were called to see the doctor or health officer for treatment? | ……<br>Mins |
| 53 | Did anyone accompany you from home to the health facility? | 0. No 1. Yes |
| | *IF YES IN QUESTION 53 PROCEED TO Q 54*<br>*IF NO IN QUESTION 53 SKIP TO QUESTION 59* | |
| 54 | If anyone did accompany you to the health facility, What is his or her employment status? | 1. Employed<br>2. Unemployed<br>3. Students<br>4. Retired |
| 55 | Did the person who accompanied you, come with you from the house and stayed with you for treatment and take you back home? | 1. No<br>2. Yes<br>3. Not applicable. |
| 56 | How many hours/minutes in total did he/she travel to and fro to be with you in the health facility? | …… Mins. |

| | | |
|---|---|---|
| 57 | How many hours/minutes in total did him/ her spend with you when you were receiving treatment in the health facility? | …… Mins. |
| 58 | How many days did he/she have to take care of you? | …… Days. |

**Depression, Anxiety and Stress Scale - 21 Items (DASS-21)**

Please read each statement and circle a number 0, 1, 2 or 3, which indicates how much the statement applied to you over the past week. There are no right or wrong answers. Do not spend too much time on any statement.

The rating scale is as follows:

[0] Did not apply to me at all.
[1] Applied to me to some degree, or some of the time.
[2] Applied to me to a considerable degree or a good part of time.
[3] Applied to me very much or most of the time.

| 59 | **Depression, Anxiety and Stress Scale items** | **Response** | | | |
|---|---|---|---|---|---|
| (a) | I found it hard to wind down | [0] | [1] | [2] | [3] |
| (b) | I was aware of dryness of my mouth | [0] | [1] | [2] | [3] |
| (c) | I couldn't seem to experience any positive feeling at all | [0] | [1] | [2] | [3] |
| (d) | I experienced breathing difficulty (e.g. rapid breathing, breathlessness in the absence of physical exertion) | [0] | [1] | [2] | [3] |
| (e) | I found it difficult to work up the initiative to do things | [0] | [1] | [2] | [3] |
| (f) | I tended to over-react to situations | [0] | [1] | [2] | [3] |
| (g) | I experienced trembling (e.g. in the hands) | [0] | [1] | [2] | [3] |
| (h) | I felt that I was using a lot of nervous energy | [0] | [1] | [2] | [3] |
| (i) | I was worried about situations in which I might panic and make a fool of myself | [0] | [1] | [2] | [3] |
| (j) | I felt that I had nothing to look forward to | [0] | [1] | [2] | [3] |
| (k) | I found myself getting agitated | [0] | [1] | [2] | [3] |
| (l) | I found it difficult to relax | [0] | [1] | [2] | [3] |
| (m) | I felt down-hearted and blue | [0] | [1] | [2] | [3] |
| (n) | I was intolerant of anything that kept me from getting on with what I was doing | [0] | [1] | [2] | [3] |
| (o) | I felt I was close to panic | [0] | [1] | [2] | [3] |
| (p) | I was unable to become enthusiastic about anything | [0] | [1] | [2] | [3] |
| (q) | I felt I wasn't worth much as a person | [0] | [1] | [2] | [3] |

| | | | | | |
|---|---|---|---|---|---|
| (r) | I felt that I was rather touchy | [0] | [1] | [2] | [3] |
| (s) | I was aware of the action of my heart in the absence of physical exertion (e.g. sense of heart rate increase, heart missing a beat) | [0] | [1] | [2] | [3] |
| (t) | I felt scared without any good reason | [0] | [1] | [2] | [3] |
| (u) | I felt that life was meaningless | [0] | [1] | [2] | [3] |

**THE ZARIT BURDEN INTERVIEW (FAMILY MEMBERS / RELATIVES)**

Please read each statement and circle a number 0, 1, 2, 3 or 4, which indicates how much the statement applied to the family member of relative over the past week. There are no right or wrong answers. Do not spend too much time on any statement.

The rating scale is as follows:

[0] Never.
[1] Rarely.
[2] Sometimes.
[3] Quite Frequently.
[4] Nearly Always

| 60 | Burden on Family members/ relatives | Response | | | | |
|---|---|---|---|---|---|---|
| (a) | Do you feel that your relative asks for more help than he/she needs? | [0] | [1] | [2] | [3] | [4] |
| (b) | Do you feel that because of the time you spend with your relative that you don't have enough time for yourself? | [0] | [1] | [2] | [3] | [4] |
| (c) | Do you feel stressed between caring for your relative and trying to meet other responsibilities for your family or work? | [0] | [1] | [2] | [3] | [4] |
| (d) | Do you feel embarrassed over your relative's behavior? | [0] | [1] | [2] | [3] | [4] |
| (e) | Do you feel angry when you are around your relative? | [0] | [1] | [2] | [3] | [4] |
| (f) | Do you feel that your relative currently affects our relationships with other family members or friends in a negative way? | [0] | [1] | [2] | [3] | [4] |
| (g) | Are you afraid what the future holds for your relative? | [0] | [1] | [2] | [3] | [4] |
| (h) | Do you feel your relative is dependent on you? | [0] | [1] | [2] | [3] | [4] |
| (i) | Do you feel strained when you are around your relative? | [0] | [1] | [2] | [3] | [4] |
| (j) | Do you feel your health has suffered because of your involvement with your relative | [0] | [1] | [2] | [3] | [4] |
| (k) | Do you feel that you don't have as much privacy as you would like because of your relative? | [0] | [1] | [2] | [3] | [4] |
| (l) | Do you feel that your social life has suffered because you are caring for your relative? | [0] | [1] | [2] | [3] | [4] |
| (m) | Do you feel uncomfortable about having friends over because of your relative | [0] | [1] | [2] | [3] | [4] |
| (n) | Do you feel that your relative seems to expect you to take care of him/her as if you were the only one he/she could depend on? | [0] | [1] | [2] | [3] | [4] |

| | | | | | | |
|---|---|---|---|---|---|---|
| (o) | Do you feel that you don't have enough money to take care of your relative in addition to the rest of your expenses? | [0] | [1] | [2] | [3] | [4] |
| (p) | Do you feel that you will be unable to take care of your relative much longer? | [0] | [1] | [2] | [3] | [4] |
| (q) | Do you feel you have lost control of your life since your relative's illness? | [0] | [1] | [2] | [3] | [4] |
| (r) | Do you wish you could leave the care of your relative to someone else? | [0] | [1] | [2] | [3] | [4] |
| (s) | Do you feel uncertain about what to do about your relative? | [0] | [1] | [2] | [3] | [4] |
| (t) | Do you feel you should be doing more for your relative? | [0] | [1] | [2] | [3] | [4] |
| (u) | Do you feel you could do a better job in caring for your relative? | [0] | [1] | [2] | [3] | [4] |
| (v) | Overall, how burdened do you feel in caring for your relative? | [0] | [1] | [2] | [3] | [4] |

**Appendix *2*: Information Sheet for Focus Groups/ Stakeholders /Residents /Family Members**

Good morning/afternoon.

Introduction: My name is Victoria Esinam Assah-Offei and I am part of a research team from the School of Public Health, University of Ghana. We are conducting a research study on **Substance Use Disorders (SUDs) and Rehabilitation among Youth in Ghana and Effects on the Family.**

**Background**: The study seeks to assess information on SUDs and quality of rehabilitation in Ghana. This research hopes to contribute to better understanding and treatment of SUDs in Ghana.

**Description**: I would like to seek your participation in this discussion to assess your experience with regards to substance use / drug addiction and rehabilitation experience. By completing the survey it will be taken that you are providing consent for the use of the data for our research.

**Voluntary consent:** Should you consent to participate in the study, you can choose to participate in all the discussions or part as may please you. You may also opt out at any stage of the discussion if you do not feel comfortable. Ahead of the interview I would like to seek your permission to audio record our conversation. Your identity will not be revealed in any part of the research findings and the audio record will be wiped after the conversation has been transcribed. You can however opt not to have this interview audio recorded. Nothing you say will be directly attributed to you in any way in the final report.

You can also choose to withdraw from the study up to 2 weeks following the interview; even if you do agree to take part. We do not anticipate that this will be more than one hour.

**Risk and benefits:** The main costs to you will be the time spent and may be discomfort in responding to some of the questions. However, we envisage that the outcome of the study will inform policy on SUDs management in Ghana for better public health policies.

**Privacy/confidentiality:** All data will be presented anonymously and no names or identities will be attached to particular responses or summaries of responses in our report. You do not need to put your name on any of the data collection sheets or informed consent forms. The only reason we may ask for your name is where it may be necessary to get back to you to clarify any of your responses. You are however free to refuse to give your name even in those circumstances. All the primary interview data collected will be stored by the Principal Investigator (PI) and be destroyed once it has been transcribed (interview data) or entered into the database for analysis (also anonymous). Within 12 months after this survey, we will have destroyed all the paper primary data collection sheets. Anonymized data may be stored on the PI's computer for approximately 5 years. Before we proceed, you are free to ask questions.

**Who to Contact**: If you have any questions about this interview either now or later you may contact

1) Victoria Esinam Assah-Offei, Principal Investigator, University of Ghana, School of Public Health on 0244254388.
2) Hannah Frimpong, the Administrator, Ghana Health Service, Ethics Review Committee on 0507041223.

**Appendix 3 – Informed Consent Form for Focus Group Discussions and In-depth Interviews**

I have read the research information (The research information was read and explained to me in the language I understand), and that all my questions have been answered to my satisfaction. I therefore agree to take part in this study. Also provide space for signature/thumbprint and date. Interviews will be tape recorded for participants to consent.

Do you agree to participate in an interview? (please tick) Yes [ ] No [ ]

Respondent's Signature/Thumbprint: …… Date: ……

Where in-depth interview is involved, I consent that the interview can be taped recorded.

Respondent's Signature/Thumbprint: …… Date: ……

If No, then end the interview and thank the prospective respondent.

I have translated the research information to the participant(s) in the language (……) she/he understands and that all questions were answered to the satisfaction of the participant(s).

Translator's Signature/Thumbprint:…… Date: ……

I witnessed the research information being translated to the participant in the language (……) that study participant understands, and provide space for signature and date.

Witness' Signature/Thumbprint: …… Date: ……..

## Appendix 4 - Ethical Approval

**GHANA HEALTH SERVICE ETHICS REVIEW COMMITTEE**

*In case of reply the number and date of this Letter should be quoted.*

Research & Development Division
Ghana Health Service
P. O. Box MB 190
Accra
*Tel: +233-302-681109*
*Fax + 233-302-685424*
*Email: ghserc@gmail.com*

*MyRef. GHS/RDD/ERC/Admin/App* 18/385
*Your Ref. No.*

20th August, 2018

Victoria Esinam Assah-Offei
University of Ghana
School of Public Health
Legon, Accra

The Ghana Health Service Ethics Review Committee has reviewed and given approval for the implementation of your Study Protocol.

| | |
|---|---|
| GHS-ERC Number | **GHS-ERC: 013/06/18** |
| Project Title | Drug Addiction and Rehabilitation among Youth and its Effects on the Family |
| Approval Date | 20th August, 2018 |
| Expiry Date | 19th August, 2019 |
| GHS-ERC Decision | **Approved** |

**This approval requires the following from the Principal Investigator**

- Submission of yearly progress report of the study to the Ethics Review Committee (ERC)
- Renewal of ethical approval if the study lasts for more than 12 months,
- Reporting of all serious adverse events related to this study to the ERC within three days verbally and seven days in writing.
- Submission of a final report **after completion** of the study
- Informing ERC if study cannot be implemented or is discontinued and reasons why
- Informing the ERC and your sponsor (where applicable) before any publication of the research findings.

Please note that any modification of the study without ERC approval of the amendment is invalid.

The ERC may observe or cause to be observed procedures and records of the study during and after implementation.

Kindly quote the protocol identification number in all future correspondence in relation to this approved protocol

SIGNED.....
DR. CYNTHIA BANNERMAN
(GHS-ERC CHAIRPERSON)

Cc: The Director, Research & Development Division, Ghana Health Service, Accra