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THE ASSOCIATION BETWEEN ALCOHOL USE AND CONSISTENT CONDOM USE AMONG MEN WHO HAVE SEX WITH MEN IN GHANA

BY

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DECLARATION

I, ANDREW ATITSOE, hereby declare that except for references made to other people's work which I have duly acknowledged, this proposal is the result of my own research done under supervision and that it has neither in neither in part nor in whole or concurrently been presented for another degree elsewhere.

…….. Date 28-04-2025

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Dr. Samuel Dery

(Supervisor)

DEDICATION

I would like to dedicate this study to my mother, Madam Grace Adzaho, whose unwavering support and constant prayers have been a source of strength and encouragement throughout the entire course of my academic journey. Your love, guidance, and belief in me have been invaluable, and I am deeply grateful for everything you've done. May God continue to bless you abundantly? I truly appreciate you.

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AIDS	-	Acquired Immunodeficiency Syndrome
aOR	-	Adjusted Odds Ratio
ART	-	Anti- Retroviral Therapy
AUDIT	-	Alcohol Use Disorders Identification Test
CDC	-	Center for Disease Control
CI	-	Confidence Interval
cOR	-	Crude Odds Ratio
GAC	-	Ghana AIDs Commission
GBMSM	-	Gay, Bisexual, Men who-have -sex with Men
HIV	-	Human Immuno-deficiency Virus
IBBSS	-	Integrated Bio-Behavioral Surveillance Survey
ILGA	-	International Lesbian, Gay, Bisexual, Trans, and Intersex Association
MSM	-	Men who-have -sex with Men
OR	-	Odds Ratio
PEP	-	Post Exposure Prophylaxis
PEPFAR	-	President's Emergency Plan for AIDS Relief
PLHIV	-	Persons Living with HIV

PrEP	-	Pre -Exposure Prophylaxis
STDs	-	Sexually Transmitted Diseases
STIs	-	Sexually Transmitted Infections
UNAIDS	-	Joint United Nations Programme on HIV/AIDs
WHO	-	World Health Organization

ABSTRACT

Introduction: MSM have an elevated risk of HIV infection. Although there have been some interventions for MSM in Ghana over the years, the prevalence of HIV rose from 18 % in 2017 to 26 % in 2023, surpassing the HIV prevalence rate of 1.53% in the general population. Alcohol use has been identified as a potential factor influencing the consistent use of condoms. It is therefore crucial to determine how alcohol use influences consistent condom use among this population in Ghana to guide future policies and interventions.

Objective: To examine the relationship between alcohol use and consistent condom use among men who have Sex with Men in Ghana.

Methods: Data was analyzed from the Integrated Biological and Behavioral Surveillance Survey (IBBSS), conducted in 2023 among MSM in Ghana using the Pearson Chi-Square to test the association between alcohol consumption, sociodemographic factors and consistent use of condom. Logistic regression models were used to assess the extent to which alcohol and sociodemographic factors influence consistent condom use.

Results: There was no association between alcohol and consistent condom use among MSM in Ghana and across different partner types (regular partners: χ^2 =1.96, p = 0.161, non–regular partners: χ^2 =0.62, p = 0.430, and paying partners: χ^2 =0.27, p = 0.610). The study also found that educational level (regular partners: χ^2 = 22.16, p<0.001, non–regular partners: χ^2 =19.57, p<0.001, paying partners: χ^2 =15.49, p = 0.008), age (regular partners: χ^2 = 11.95, p=0.008, non–regular partners: χ^2 =12.04, p=0.007, paying partners: χ^2 =11.03, p = 0.012), religious beliefs (regular partners: χ^2 = 14.32, p=0.006, non–regular partners: χ^2 =11.88, p=0.018, paying partners: χ^2 =11.72, p=0.020), occupation (regular partners: χ^2 = 41.16, p<0.001, non–regular partners: χ^2 =61.36, p<0.001, paying partners: χ^2 =30.59,p=0.015), and geographical region (regular partners:

χ^2=145.63, p<0.001, non-regular partners :χ^2=88.49, p<0.001, paying partners: χ^2=28.98, p<0.001) were significantly associated with consistent condom use among regular, non-regular, and paying partners. The findings showed that MSM with higher educational levels are twice as likely to use condoms consistently with their non-regular partners (aOR: 2.22; 95% CI: 0.98–5.07). Another notable finding was that MSM who worked as peer educators were 4 times more likely to use condoms with their non- regular partners (aOR: 4.11; 95% CI: 2.24 - 7.53; p-value < 0.001).

Conclusion: The study found no significant association between alcohol use and consistent condom use among MSM in Ghana across all partner types. However, educational level, religious belief, occupation, and geographical region were significantly associated with condom use. MSM with higher education were twice as likely to use condoms consistently with non-regular partners, and those working as peer educators were four times more likely to do so. These findings highlight the importance of socio-demographic factors in shaping safer sexual practices among MSM.

Keywords: HIV, MSM, consistent condom use.

CHAPTER ONE

INTRODUCTION

The chapter discusses the study's background, problem statement, conceptual framework, and research objectives.

1.1 Background to the study

Alcohol, also known as ethanol, is a psychoactive substance that is consumed around the world for its intoxicating effects. Its effects on the body vary depending on factors such as the amount consumed, the individual's tolerance, and other factors like weight, age, and gender. Alcohol has been consumed by humans for thousands of years and is commonly found in beverages such as beer, wine, and spirits. According to the World Health Organization, alcohol is used by people of all ages across the globe (Martinez et al., 2017). In 2016, it was estimated that 43% of the global population above 15 years had consumed alcohol over the past 12 months (Martinez et al., 2017). The consumption of alcohol can often intersect with decisions regarding safer sexual practices, particularly the use of condoms. Alcohol consumption and its effect on public health have been subjects of significant investigation and research over the years. Among the multiple health concerns associated with the use of alcohol, its potential link to HIV infection has emerged as a topic of growing interest and concern. Furthermore, alcohol is commonly used as a substance to boost sexual performance, a symbol of masculinity, as well as to relax, socialize, and enhance communication skills (Rocha et al., 2020). Ghanaian MSM face intricate and multifaceted structural inequalities, which include stigma and marginalization, which hinder access to optimal healthcare, access to social support services, engagement in public health interventions like condom use campaigns, and facilitate increased vulnerability to HIV infection (Nelson et al., 2015). Hence, alcohol plays an important role in the lives of MSM, often as a response to

marginalization. Studies suggest that participation in social environments like bars, where alcohol is consumed, has been crucial for MSM to engage with the gay community and culture (Vosburgh et al., 2012) and, as such led to the widespread consumption of alcohol among MSM. Several MSM may use alcohol before engaging in sex, which can impair judgment and increase the chance of unprotected anal sex, sometimes with individuals whose HIV status is not known. The consumption of alcohol can often intersect with decisions regarding safer sexual practices, particularly the use of condoms. Alcohol consumption and its effect on public health have been subjects of significant investigation and research over the years. Among the multiple health concerns associated with the use of alcohol, its potential link to HIV infection has emerged as a topic of growing interest and concern. Heavy alcohol use has been associated with an increased chance of engaging in risky behaviours, such as unprotected sex and having multiple sexual partners, which can heighten the risk of HIV acquisition. Alcohol consumption was quickly suggested as a contributing factor to risky sex, leading to the development of intervention campaigns aimed at warning people against combining alcohol with sexual activities. Research indicates that alcohol consumption is a key predictor of risky sexual behavior among MSM.

On the other hand, Human Immune Virus disproportionately affects gay, cisgender, and bisexual Men who have sex with Men in Ghana. Findings from Ghana revealed that the majority of MSM engage in risky sexual behaviors such as inconsistent condom use (G. M. Abubakari et al., 2021). Even in countries where HIV is not attributed to homosexual sex, the link between homosexuality and HIV remains central to the epidemic, with many societies viewing homosexuality with a mix of disdain and disgust. As a result, it has been a significant factor in the progression of this epidemic (Park et al., 2013). Sexual risk behaviours are the primary cause of HIV transmission in MSM, with condomless receptive anal sex posing the greatest risk for acquiring HIV. Key risk

factors for HIV among MSM include having multiple partners, having condomless anal sex with unknown or assumed HIV-negative status, substance use during sexual activity, and inconsistent or improper use of condoms.

The use of condoms for the prevention of HIV infection is a crucial component of HIV prevention globally and in Ghana. In addition to this, studies have proven that consistent and correct condom use is very effective in risk of STIs. Consistent condom use is key for the prevention of HIV transmission and Sexually Transmitted Diseases among young adults, especially (Nielson et al., 2010). Inconsistent use of condoms is still a critical issue in the global fight against HIV/AIDS. Despite the extensive knowledge of how effective condoms are in preventing HIV and STIs, many individuals engage in sexual practices that lack consistent condom use, placing themselves at heightened risk of infection, and one of the contributing factors is alcohol consumption, which tends to put an individual at risk. Given its high prevalence among MSM, substance use is an established risk factor for HIV(Stahlman et al., 2016). Some common interventions on improving condom use in Ghana, which included public education, psychosocial interventions, and attention, have not been given to alcohol consumption and the role it can play. It is well researched that the correct and consistent use of a condom is an effective preventive measure against HIV/AIDS and STIs. The association between the use of alcohol and consistent use of condoms and consequently HIV infection presents a complex relationship that needs thorough investigation. The absence of strong event-level findings, combined with overall consistent findings from global association studies, suggests that more focused intervention efforts should be directed toward individuals who engage in heavy drinking.

1.2 Problem Statement

In Ghana, as in many other parts of the world, MSM represent a population at heightened risk for HIV and STIs. Although condoms are accessible and various strategies have been implemented to promote safer sexual practices, such as the Ghana Nation Condom and Water-Based Lubricant Programming Strategy (2014–2019), the National HIV and AIDS Strategic Plan (2011-2015), and the Ghana MARP Strategic Framework (2011–2015), inconsistent condom use continues to be a public health concern among MSM in Ghana (Nelson et al., 2015). In Ghana, inconsistent use of condoms among the general population has proven to be reducing over the years. However, it is rather increasing among the MSM population (Akuoko et al., 2021). In Ghana, studies have highlighted the high HIV burden among the MSM population, with a rate of 26 % compared to 1.53% of the general population. Alcohol use is prevalent among MSM in Ghana and is one factor that has been shown to influence sexual decision-making, often impairing judgment and reducing the likelihood of condom use during sexual encounters. However, the association between alcohol use and consistent condom use among MSM in Ghana has not been extensively studied. Existing literature indicates that alcohol use results in risky sexual behaviors, including decreased condom use, but the dynamics of this relationship in the context of Ghana are not well understood. Cultural attitudes towards alcohol consumption, social stigma surrounding homosexuality, and limited access to sexual health education may further complicate the association between alcohol consumption and the consistent use of condoms. The absence of targeted research on how alcohol influences consistent condom use among MSM in Ghana limits the development of effective interventions to reduce HIV transmission in this group. This knowledge gap is particularly concerning given that MSM in Ghana face high rates of HIV transmission, with many individuals having unprotected sex under alcohol influence. Understanding how alcohol moderates consistent

condom use in this population is essential for developing culturally relevant and context-specific public health strategies. Therefore, the study seeks to determine an association between the use of alcohol and consistent condom use among MSM in Ghana. The findings will provide critical insights that can inform HIV prevention efforts and improve sexual health outcomes for MSM in Ghana.

1.3.1 Narrative to the conceptual framework

The researcher developed the conceptual framework for this study to illustrate the key variables, their relationships, and the overall direction of the research. This conceptual framework explores the association between the use of alcohol and consistent condom use among MSM. The framework is designed to provide insights into how social and demographic factors, as well as the use of alcohol, on consistent condom use. The framework identifies alcohol use as the independent variable. Alcohol drinking is often associated with risky behaviors, and among MSM, it plays a significant role in influencing sexual behavior (Maisto et al., 2012). Alcohol can impair judgment, reduce inhibitions, and increase the chance of condomless sex. Thus, higher levels of alcohol intake may reduce the odds of consistent condom use. This is key in preventing STIs and HIV transmission. The dependent variable in this framework is consistent condom use. Consistent condom use is key in preventing the spread of HIV and STIs. Despite the proven benefits of condom use, it is often inconsistent (Ayer et al., 2021)(Olawore et al., 2021),with many individuals engaging in risky behaviors. The relationship between alcohol use and the consistent use of condoms is not straightforward. The framework also suggests that sociodemographic factors could influence condom use. A recent study proved that sociodemographic factors like age, socioeconomic status, and educational level may influence the impact of alcohol on consistent condom use (Scott-Sheldon et al., 2017). For instance, younger MSM may be more influenced by

peer pressure to engage in risky behaviors when drinking (Wray et al., 2020), while older MSM may have more experience with safer sexual practices. In conclusion, this conceptual framework aims to shed light on the association between alcohol use and the consistent use of condoms among MSM. By considering the influence of socio-demographic factors, this framework provides a holistic approach to understanding and addressing sexual health risks in this population.

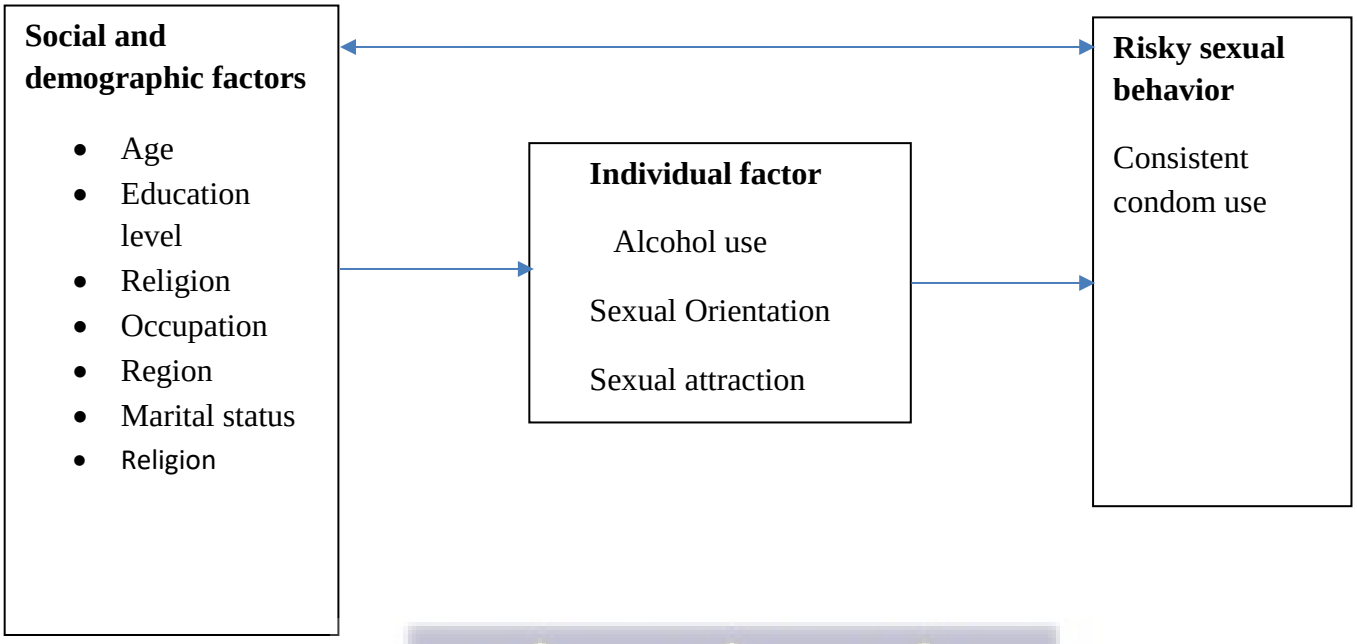

Figure 1: Conceptual Framework

1.4 Justification of Study

The prevalence of HIV among MSM in Ghana has increased. Despite the number of HIV research studies that have been done considering other risk factors among the MSM population, there has not been enough focus on alcohol use specifically and how it influences consistent condom use among this population in Ghana. MSM have the highest prevalence of HIV among the various categories of key populations, and it is better to understand how alcohol use influences consistent condom use among this population. Moreover, the association between the use of alcohol use and consistent condom usage has not been established and remains underexplored. This study aims to address this knowledge gap by examining how alcohol use influences condom usage and the likelihood of increasing the HIV incidence among this population. The justification of this research is centered on its potential to inform public health decision-making and interventions on how

alcohol use can play a role in the incidence of HIV and the probable need to prioritize alcohol reduction strategies.

1.5 General Objective:

To examine the relationship between alcohol use and consistent condom use among men who have Sex with Men in Ghana.

1.5.1 Specific Objectives

1. To examine the association between alcohol consumption and consistent condom use among MSM partner types in Ghana.
2. To examine the association between socio-demographic factors and consistent condom use among MSM partner types in Ghana.
3. To examine the extent to which alcohol and sociodemographic factors influence consistent condom use among MSM partner types in Ghana.

1.6 Research Question

1. What is the association between alcohol consumption and consistent condom use among MSM partner types in Ghana?
2. What is the association between socio-demographic factors and consistent condom use among MSM partner types in Ghana?
3. What is the extent to which alcohol and sociodemographic factors influence consistent condom use among MSM partner types in Ghana?

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

The chapter offers an in-depth existing literature on alcohol consumption and regular condom use, specifically exploring how these factors intersect with the health behaviors of MSM. It reviews global patterns and delves into the context in Ghana, examining the influence of alcohol use on sexual health practices, particularly condom use, within the MSM population.

2.1 MSM

MSM are vulnerable to HIV/AIDS, contributing significantly to the global burden of new HIV infections. This group accounts for 23% of all new HIV cases worldwide. Research indicates MSM are at a heightened risk of HIV, been 19 times more likely to contract the virus than the overall population of reproductive age, with a prevalence rate of 12% (Akuoko et al., 2021). In sub-Saharan Africa, MSM carry a disproportionate burden of HIV, leading to global recommendations for an HIV response that ensures a non-discriminatory, human rights-based approach for key populations, particularly MSM, to guarantee equal access to health services and opportunities for well-being (Abara & Garba, 2017). In Ghana, the HIV prevalence rate among MSM is approximately 26%, compared to about 1.53 % in the general population. Over the past two decades, biomedical advances in HIV prevention, such as HIV self-testing, PrEP, and PEP, have broadened the range of HIV prevention strategies available to MSM. Despite these innovations, male condoms remain one of the most effective, accessible methods for preventing HIV and STIs (UNAIDS, 2021). In resource-limited settings, promoting condom use has been a crucial strategy for HIV prevention. When condoms are used correctly and consistently, they are estimated to be 73% to 99.6% effective in preventing HIV transmission during anal intercourse (Johnson et al., 2018). However,

studies have shown MSM, including younger individuals, avoid using condoms or use them irregularly (Johnson et al., 2018) (Rocha et al., 2020)(Wong et al., 2022). Some research has highlighted potential factors such as experiences of sexual abuse and internalized stigma are contributing factors, although data on these challenges within the African context is still scarce.

2.2 HIV among MSM

In Ghana, the high rates of HIV infections are concentrated among key populations, including MSM, people who inject drugs, sex workers, transgender individuals, and prisoners. (UNAIDS, 2021). A few countries employed approaches aimed at tackling the issue among the population, like HIV testing, condom use, PreP and PEP, and needles and syringes. However, studies conducted in 20 countries showed that there was a reduction in the number of MSM reached with HIV prevention services from 59 percent to 40 percent (Phillips, 2019). There has been a link between the MSM and the heterosexual group (Abara & Garba, 2017). A 2017 study found that, among MSM, in Western Europe and North America, 57% of HIV infections occur, followed by 41% in Latin America and the Caribbean, 25% in Asia and the Pacific, and 20% in Eastern Europe, Central Asia, and the Middle East and North Africa. Data from the same year also revealed that MSM accounted for 12 percent of new infections in central and western Africa (Phillips, 2019). Mauritania has been reported to account for 45% of recent HIV infections. MSM in sub-Saharan Africa experience significant barriers in accessing prevention services, highlighting the urgent need for targeted interventions aimed at reducing HIV transmission within this group, as they serve as a bridge to the broader population.

2.3 Factors influencing the risk of HIV among MSM

As compared to unprotected vaginal sex, there is an increased risk of HIV transmission when MSM engage in unprotected anal intercourse. This is due to the thin anal walls, which are prone to tearing, providing an easier pathway for HIV to enter the bloodstream (Phillips, 2019). The sexual role of MSM also plays a risk factor for HIV transmission. MSM can either play an insertive or a receptive role, known as 'topping' and 'bottoming' respectively (Esang, 2011). An HIV negative person who has anal sex with an HIV-positive partner can have rectal fluids that contain the HIV to encounter the urethra or penis foreskin, which leads to vulnerability to HIV infection (Wilton, 2008). A global review by ILGA found that nearly 50 percent of the countries where homosexuality is criminalized are located in Africa (van Heerden, 2019). Of the 54 African nations, only 22 have decriminalized homosexuality. In most countries, including Ghana, it is punishable by imprisonment. In other countries like Nigeria, Mauritania, Somalia, and South Sudan, it is punishable by death. The constitution of Ghana criminalizes all activities of MSM. This makes it difficult for MSM to avail themselves for HIV prevention services, both at the community level and the health facilities, due to the fear of stigma and discrimination. Another significant issue is the gap in knowledge of condom use among MSM, which results in their heightened risk of contracting HIV. A study found that fewer than 60% of MSM in 33 out of 87 countries reported using a condom during their most recent anal sex encounter. The rates of condom use surpassed 80% in only 15 countries (UNAIDS, 2021). The overall level of use of HIV services is generally low (Ali et al., 2019). In addition to the biological and behavioral factors discussed above that affect the HIV risk of MSM, sociocultural factors play a key role as well. Considering the norms and values in various countries, the activities of MSM are often accompanied by stigma, violence, and discrimination. Consequently, MSM tend to be closed about

their sexual orientation and avoid all forms of preventive services. The stigma goes a long way to affect People Living with HIV. This interferes with clinical visits and Anti-Retroviral Therapy adherence. Societal norms, religious and individual beliefs of some healthcare workers also lead to certain forms of stigma at the healthcare facilities, and that allows the MSM to go into hiding and shun all HIV preventive services.

2.4 Regular Partners of MSM

The nature of the relationship with a sexual partner plays a significant role in condom use decisions. Descriptive studies show that rates of consistent condom use differ depending on the type of partner (Brahmam et al., 2008). Many studies documented a strong association between the use of alcohol and risky behaviours in MSM, including inconsistent condom use. Research suggests that alcohol use may impair judgment and lower inhibitions, making individuals less inclined to use condoms, even with regular partners. For example, a study found that the use of alcohol was significantly associated with a decrease in the use of condoms among MSM, particularly when alcohol was consumed before sexual encounters (Pantalone et al., 2020). Alcohol may lead individuals to underestimate the risks of HIV and STIs, influencing their decision to forgo condom use, even in long-term relationships. In addition to its effects on risk perception and decision-making, alcohol can also increase sexual arousal and reduce sexual control, further compromising safe sex practices (Fisher et al., 2011).While this is particularly pronounced in casual sexual encounters, alcohol's effect on sexual behaviour in regular partnerships is also noteworthy, as it may encourage a false sense of safety or familiarity with a partner, leading to inconsistent condom use. With MSM with regular partners, alcohol may exacerbate the tendency to prioritize sexual intimacy over condom use, particularly if the individuals have been in the relationship for a prolonged period. Studies suggest that couples in

regular partnerships may develop a false sense of security, believing that they are at a lower risk for HIV/STIs due to their regular sexual interactions, despite one or both partners potentially engaging in high-risk behaviours outside of the relationship (Baral et al., 2011). In these contexts, alcohol use can further complicate condom use as it fosters emotional intimacy and increases the likelihood of engaging in unprotected sex. Social norms and peer influences also affect alcohol-related sexual behaviours. Research shows that alcohol use is often normalized in certain MSM communities, particularly in settings like bars, clubs, and parties, where sexual encounters with regular or new partners may occur. A study by Greene et al. (2014) found that MSM in environments where drinking is prevalent tend to engage in risky sexual behaviors such as inconsistent condom use, irrespective of the nature of their relationships. The normalization of alcohol consumption in these social environments creates a context where unsafe sexual practices are more likely, regardless of partner familiarity.

2.5 Non-Regular Partners of MSM

The nature of the relationship with a sexual partner appears to play an important role in condom use among MSM. Research indicates that condom use is more common with non-regular partners than with regular ones, possibly due to the perception of a lower risk in steady relationships (Ayer et al., 2021)(Olawore et al., 2021). However, there are not enough research exploring the factors contributing to the inconsistent use of condoms among non-regular partners, particularly in developing countries (Lim et al., 2013) (Ramanathan et al., 2013). One study found that even in non-committed relationships where condom use is generally higher, 50.8% of MSM still did not use condoms consistently, which increases their vulnerability to HIV. These results indicate that, although condom use is an individual behaviour, consistent condom use in non-regular relationships among MSM is influenced by factors beyond individual choice (Yang et al., 2016).

2.6 Paying Partners of MSM

Paying partners are individuals who exchange money, goods, or services for sex. MSM represent a population at elevated risk for HIV and STIs, particularly when involved in transactional sex. The use of alcohol was found to be linked to transactional sex (Stephenson et al., 2014) and rape among MSM (Lane et al., 2008). They experience unique risks associated with alcohol consumption and inconsistent condom use. Studies suggest that alcohol use among both MSM and their paying partners can impair judgment and lower inhibitions, leading to inconsistent condom use during sexual encounters. Alcohol use is strongly associated with risky sexual behaviour in MSM, and this relationship is further complicated in the context of transactional sex. For both MSM and their paying partners, alcohol can decrease sexual inhibition, leading to impulsive decisions that undermine safer sex practices. In transactional sexual encounters, where the focus may be on physical pleasure or financial exchange rather than mutual concern for sexual health, alcohol may lower the perceived need for condoms. Research has consistently shown that alcohol consumption increases the likelihood of unprotected sex, as it impairs decision-making and reduces the ability to assess risks accurately (Sharma et al., 2018). A study conducted by Tobin et al. (2014) found that alcohol use among both MSM and their paying partners significantly decreased the likelihood of consistent condom use, particularly in environments where drinking was normalized. Alcohol consumption can also influence the emotional and psychological aspects of transactional sex, making paying partners more likely to overlook or discount the risks associated with unprotected sex. Studies have shown that alcohol consumption can create a sense of intimacy or relaxation, which may fail to use condoms even when HIV risk and other STIs are high (Sang et al., 2021). Moreover, alcohol's role in reducing anxiety and social awkwardness may increase sexual arousal and lower inhibitions, further facilitating unprotected sex. The dynamics

of power in transactional sex are a key factor influencing condom use. Paying partners often hold a position of power in these encounters, as they could set terms or dictate the nature of the exchange. For MSM engaging in transactional sex, the financial dependence on their paying partners may limit their ability to negotiate condom use effectively, especially if alcohol is involved. Studies indicate that alcohol can exacerbate existing power imbalances, with paying partners sometimes using alcohol to manipulate or coerce the MSM into having unprotected sex (Vosburgh et al., 2012). This dynamic is especially pronounced in settings where MSM may be economically disadvantaged or facing pressures to comply with the demands of their paying partners. Transactional sex often involves emotional and financial vulnerability, which can further complicate condom negotiations. The presence of alcohol in such encounters can make it harder for MSM to assert their sexual health needs, especially when their primary concern is the financial exchange rather than sexual safety. A study by Baral et al. (2011) highlighted how alcohol use can influence condom use in contexts of financial exchange, as MSM may prioritize maintaining their clients' satisfaction over ensuring their sexual health. The social environment in which transactional sex occurs plays a significant role in the relationship between the use of alcohol and inconsistent use of condoms. Many MSM who engage in transactional sex with paying partners do so in settings where alcohol consumption is normalized or even encouraged. This includes bars, clubs, and online platforms that facilitate sexual exchanges. In such environments, alcohol consumption may not only be common but also expected, further contributing to the normalization of risky sexual behaviours. According to research by Santos et al. (2018), environments that promote alcohol use are often associated with increased rates of unprotected sex among MSM, particularly when sexual encounters are transactional in nature. Additionally, the social stigma associated with transactional sex can limit the ability of MSM to seek out sexual health services

or engage in open communication about condom use. MSM involved in sex work are often marginalized, and alcohol may be used as a coping mechanism for social isolation or to mask the emotional toll of such encounters (Friedman et al., 2014). The combination of alcohol and social stigma can create a vicious cycle, where individuals feel less empowered to advocate for their sexual health.

2.7 Alcohol use among MSM

Substance use, particularly alcohol consumption, is prevalent among MSM. Studies highlight that GBMSM are more prone to alcohol consumption and are likely to engage in heavy drinking into older age (Tobin et al., 2014). Studies have shown that the prevalence of alcohol use in MSM is higher than that of the general male population, though the rates vary due to differences in study methodologies (Sandfort et al., 2017). While alcohol use is linked to risky sexual behaviours, it is not directly associated with HIV infection itself (Sandfort et al., 2017).

In African countries, alcohol use among MSM has been found to range from 50 percent in South Africa (McAdams-Mahmoud et al., 2014) to 100 percent in Kenya (King et al., 2013), with over 50% of MSM in various regions of Ghana reporting alcohol use in the past year. For many MSM, alcohol serves as a coping mechanism for social marginalization, such as discrimination and homophobia, and is often connected to mental health issues (Abubakari et al., 2021). Gay bars and clubs have historically provided a supportive space for MSM, and alcohol consumption within these settings is closely tied to participation in gay culture (Vosburgh et al., 2012). In qualitative studies, MSM stated using alcohol to enhance sexual experiences or to cope with societal disapproval and stigma related to their sexual orientation and HIV status (Martinez et al., 2017). Furthermore, alcohol use is often associated with decreased condom use, as shown in cross-sectional studies linking alcohol consumption to higher rates of unsafe sex (Bimbi et al., 2006).

Alcohol's role in HIV risk is particularly significant because it can interfere with preventive behaviours such as condom use (Rehm, 2011; Shuper et al., 2010). Alcohol consumption is also linked to impaired sexual decision-making and may lead to risky behaviours, including condomless sex (Wray et al., 2020). Recent studies in sub-Saharan Africa have highlighted alcohol use as a predictor of sexual risk behaviours among MSM, particularly when combined with depression and other addictions (Tucker et al., 2014; Hill et al., 2018; Sandfort et al., 2017). For example, research in Kenya found that 44% of GBMSM engaged in hazardous use of alcohol (Tucker et al., 2014). In Ghana, alcohol use has been identified as a key risk factor for HIV transmission, with a significant portion of MSM reporting regular alcohol consumption (Nalá et al., 2015). Frequent consumption of alcohol among MSM in Africa is a critical issue that requires focused prevention efforts, as it contributes to higher levels of HIV risk behaviour (Sanders et al., 2013). Despite growing recognition of alcohol's impact on sexual health, research on alcohol use and its effects on condom use among MSM in Ghana remains limited, representing a significant gap in understanding the specific risk factors for this population.

2.8 Association between some socio-demographic factors and consistent condom use among MSM.

Various studies have highlighted the influence of socio-demographic factors on condom use among MSM. For example, Johansson et al. (2018) found that lower educational level, being single, and residing in metropolitan areas were independently associated with engaging in condomless sex. Similarly, Gutiérrez et al. (2006) identified being single, possessing strong life skills, and having a high socio-economic status as key predictors of condom usage. (Ajayi et al. (2019) and Brewer et al., (2020) also observed that consistent condom use was significantly

associated with factors such as open communication about HIV/STIs with partners, awareness of a partner's HIV status, and attaining tertiary education.

Abdulai et al. (2024) further emphasized that age, education, condom accessibility and lubricants, participation in counseling, and knowledge about condom and lubricant use significantly contribute to consistent condom use. Supporting this, Badasu et al. (2016) found that variables such as age, sex, education level, urban or rural residence, and marital status had a significant statistical relationship with condom use among individuals with non-regular partners. They concluded that condom use in such scenarios is less influenced by religiosity and more by perceived risk, which is often shaped by socio-economic standing and education level.

Moreover, Ahinkorah et al. (2020) reported that occupational status, a determinant of socio-economic position, also plays a critical role; men in the highest wealth quintile were notably more likely to use condoms consistently than those in the lowest quintile [aOR = 2.62, CI = 1.30–5.27]. Abdulai et al. (2024) also confirmed a positive correlation between socio-economic factors and consistent condom use among MSM. Individuals with moderate income levels, in particular, often benefit from increased exposure to HIV prevention messages via media such as newspapers, documentaries, and magazines, which may enhance their condom negotiation skills and their ability to refuse sex without protection. Lastly, marital and cohabitation status also appear influential. Abara et al. (2017) found that MSM who were married were significantly less likely to use condom to those who were single or not cohabiting (aOR = 0.29, 95% CI = 0.13–0.66).

2.9 The association between the use of alcohol and consistent condom use

Several studies have highlighted the occurrence of sexual activity under the influence of alcohol (Price et al., 2012; Rispel et al., 2011). Five quantitative research works have found a connection between alcohol and condomless sex (Aho et al., 2014; Eaton et al., 2013; Geibel et al., 2008; Lane et al., 2008; Tucker et al., 2014) with only one study explicitly stating no such link (Kim et al., 2016). A work by Aho et al. (2014) discovered that the frequency of alcohol use in the last thirty days was linked to unprotected sex, independent of other risk concerns. Of the individuals who had not consumed alcohol in the past 30 days, 52.2% reported using condoms inconsistently. This rate increased to 70.7% among those who drank alcohol once a week or less, and rose further to 74.4% for those who consumed alcohol more than once a week. The aOR and 95% confidence intervals were 2.05 (1.14, 3.69) and 2.48 (1.13, 5.44), respectively. In interviews conducted in 2013, some MSM reported that alcohol use lowered the likelihood of using condoms (King et al., 2013) . Participants noted that alcohol often heightened sexual interest but also impaired decision-making, leading some individuals, even those who typically used condoms, to forgo them while intoxicated (Musinguzi et al., 2015; Okal et al., 2015). Cross-sectional studies also revealed a relationship between heavier alcohol use and less frequent condom use during sexual encounters, particularly among MSM (Bruce et al., 2013). Elevated rates of binge drinking among MSM were linked to an increased risk of unsafe sexual practices, heightening the likelihood of HIV infection (Peacock et al., 2015; Woolf & Maisto, 2009), poor outcomes for HIV positive MSM (Sheinfil et al., 2022) , mental health issues (Peacock et al., 2015), intimate partner violence (Davis et al., 2016), and disruptions in personal and financial stability (Wolitski et al., 2008). Although the overall literature on sexual behaviour is inconsistent in supporting a link between the use of alcohol and condoms, several studies focused on MSM have found a notable connection. These

inconsistencies could stem from different research methodologies, with stronger associations observed at the broader level (i.e., examining substance use and sexual behaviours over extended periods) than at the event level. Some well-documented reasons for inconsistent condom use include lower perceived sexual satisfaction from condom use, reduced personal risk perception regarding STIs, and having a consistent sexual partner regarding condom use. Research has highlighted self-efficacy as a key factor influencing condom use (Roy et al., 2012). Men who have sex with men (MSM) are more likely to engage in risky sexual behaviors—such as inconsistent condom use—when involved with both casual and regular partners, compared to those who are not. Among students, inconsistent condom use has been attributed to factors such as trust in partners, limited availability of condoms, negative attitudes toward condom use, and the perception that condoms lessen sexual pleasure (Kwok et al., 2010; Sunmola et al., 2007). A significant study of randomized controlled trials carried out among heterosexual men and women has demonstrated that alcohol consumption increases the chance of unprotected sex compared to non-alcohol control conditions and placebo (Scott-Sheldon et al., 2017). However, only one of the 30 studies included in a meta-analysis focused specifically on MSM (Maisto et al., 2012), which is a notable limitation given that the consequences of risky sexual behaviours may be more severe for MSM due to the higher prevalence of HIV in this group. Additionally, Lane et al. (2008) categorized men based on their alcohol consumption patterns: irregular drinkers (those who drank less than once per week and rarely became drunk), regular drinkers (those who drank at least once a week but were rarely intoxicated), and regular drinkers to intoxication (those who drank at least once a week and became drunk at least once a week). The study found that 36.1 percent, 23.8 percent and 40.1 percent of men fell into these groups, respectively. He also found that alcohol use was independently linked to condomless sex, with aOR of 4.1 (95% CI: 1.4, 12.6) for regular

drinkers and 2.6 (95% CI: 1.0, 6.8) for those who regularly drank to intoxication. The study also showed that alcohol use was associated with other factors such as multiple sexual partners, outdoor sex, forceful sex, rectal trauma, and STI symptoms in the past year. Another study revealed that alcohol consumption was linked with reduced communication about HIV status between partners. (Knox et al., 2013). The proportion of men who reported having sex due to alcohol varied significantly, with 47.3 percent of participants in Cape Town, South Africa, and 77.5 percent in Nairobi, Kenya, reporting alcohol-influenced sexual activity. In Cameroon, 66.1% of men reported engaging in sex after drinking alcohol in the past year (Park et al., 2013). In a study conducted by Rispel et al. (2011), nearly 75% of participants indicated that they had engaged in sexual activity while under the influence of alcohol. A study examining alcohol use within two hours of sexual activity found a significant association with an increased chance of engaging in unprotected anal sex. Among men who reported engaging in unprotected anal sex in the last six months, 80.4 percent had consumed alcohol within two hours before sex, compared to 65.9 percent of those who did not engage in unprotected anal sex (Tucker et al., 2014). Qualitative research has explored how alcohol facilitates sexual behaviour among MSM. For instance, one man in Namibia shared, "The 'straight' guys… approach us only when they are drinking or are drunk. We do not sleep together during the day; mostly, we sleep with each other at night. It is difficult to make them wear a condom when they are drunk" (Lorway, 2006). A study by Collier et al. (2015) also found that some men use alcohol to dull the pain that comes with being the receptive one during anal sex. One participant explained, "When I am sober, I feel the sex pain. When I'm drunk, I don't feel it" (p.323), although the use of alcohol leads to rougher and less controlled sex, increasing the risk of pain and HIV transmission. Baral et al. (2011) revealed that nearly 50% of the 230 men surveyed were less likely to use condoms while intoxicated. Similarly, some participants in Kennedy et al.

(2013) study linked alcohol use to continued risk-taking behaviours, with one participant stating, "Most of the time we have sex without a condom, it is when we are drunk" (p.4). However, the use of alcohol does not always result in condomless sex. A study by Siegler et al. (2014) found that one-third of men who reported having sex while intoxicated still used condoms, often through strategies like agreeing in advance which partner would provide the condoms. Lane et al. (2008) noted that among MSM, substance use was mostly limited to alcohol consumption, with other drugs being used less frequently (Chapman et al., 2011; Sanders et al., 2013). Numerous studies have confirmed a positive association between substance use (especially alcohol) and engaging in risky behaviours, aligning with findings from other African populations. How frequently alcohol is been used, particularly in connection with sexual activity, was noted to be high in MSM populations across various African countries, including Botswana (Ehlers et al., 2001), Mozambique (Nalá et al., 2015), Rwanda (Chapman et al., 2011), South Africa, and Uganda (Lane et al., 2008). While there is substantial evidence that alcohol use is widespread among MSM in sub-Saharan Africa and is linked to higher HIV risk practices, there are significant gaps in understanding the psychosocial and other contextual factors that influence the use of alcohol in this population. Despite this, global studies consistently show that alcohol use, especially heavy use, is linked with a higher likelihood of HIV risky behaviours. Stall et al. (2001) examined the psychological characteristics of men who consistently used condoms during all substance-involved anal sex versus those who never used condoms during such activities. The study found alcohol use was not a significant predictor of condom use. However, within-subject analyses were not conducted, and those who did employ this method of analysis found inconsistent evidence linking alcohol use to condom use. This conclusion must be considered with caution, as only six studies of this kind have been carried out, each with limitations that hinder broad generalization. Several

global reviews by Halpern-Felsher et al. (2005) have affirmed the connection between alcohol and unsafe sexual behaviours. The alcohol myopia model helps explain the impact of alcohol on social behaviour, indicating that alcohol impairs cognitive function, causing people to prioritize the immediate environmental triggers. Based on this model, maintaining consistent condom use can be difficult within the MSM population. Laboratory-based experiments also support the idea that alcohol consumption leads to reduced condom use, as it impairs cognitive functions important for sexual decision-making. For example, using a placebo-controlled alcohol administration study, it was found that alcohol and sex-related alcohol expectations negatively impacted participants' motivation to negotiate condom use. Furthermore, heavy alcohol drinking was significantly associated with physical or sexual violence, both from regular and casual partners, as well as monitoring and controlling behaviours within these relationships. Because of the limitations inherent in critical-incident studies, multiple-event studies are regarded as a more reliable approach for examining the connection between alcohol use and risky sexual behavior. However, even in these studies, no compelling evidence has been found linking alcohol use to risky sexual behaviour at the event level, suggesting that the association may be weak or non-existent. This, combined with the more consistent findings from global studies, indicates that interventions should particularly target heavy alcohol drinkers to address sexual risk behaviours. The existing literature on sexual behaviour shows inconsistent results regarding the association between alcohol use and the use of condoms, particularly among this population. This inconsistency is likely due to variations in study methods, where the association appears stronger when alcohol use and sexual behaviours are measured over a long period (global level) and weaker when assessed on an event-by-event basis. These mixed results highlight the need for more in-depth research into how alcohol affects sexual behaviour across different analytical levels, especially among MSM in Ghana. The

limitations of current studies include lack of focused research on alcohol use and its link to HIV, insufficient assessment of substance use, potential underreporting of alcohol consumption, and a general scarcity of research on MSM populations. In Ghana, the topic of alcohol use among MSM has received relatively little attention, and there is a gap in using more accurate, validated methods, like computer-assisted self-interviews, that could reduce underreporting and offer clearer insights into the extent of the issue. While many studies suggest a connection between the use of alcohol and risky behaviours, the evidence remains complex and inconclusive. The Ghana Men Study II, for example, found no significant link between alcohol and condom use among MSM. However, other studies have identified a correlation between alcohol and condom in this group. Given these inconsistencies, this research aims to specifically investigate the association between alcohol and consistent condom use among MSM in Ghana using data from the Ghana Men Study III.

CHAPTER THREE

METHODOLOGY

3.0 Introduction

The chapter provides a comprehensive overview of the methods used to conduct the study, including the design, study area, target population, key variables, and the approach to data analysis.

3.1 Study Design

This study is a secondary data analysis, utilizing data derived from the IBBSS conducted in 2023. The study obtained information from MSM across the 10 regions of Ghana. Data was collected on sociodemographic, sexual behavior practices, condom use, and alcohol use.

3.2 Study population

The Ghana Men's Study III recruited participants who were biologically male, at least 18 years old, and reported consensual sexual intercourse with another male in the past six months, and had lived or socialized in any of the regions where the research was carried out.

3.2.1 Inclusion and exclusion criteria

Individuals were eligible to participate if they were assigned male at birth, were 18 years or older, had self-reported engaging in consensual anal intercourse with another man within the past 12 months, resided, worked, or socialized in any region of Ghana, were able to communicate in English or a Ghanaian language, and were capable of providing informed consent. Those who were unable to give informed consent, such as individuals under the influence of drugs or alcohol at the time of recruitment, were excluded from the study.

3.3 Study area

The study area was Ghana and carried out using the original 10 regions namely: Greater Accra, Ashanti, Western, Central, Eastern, Volta, Brong -Ahafo, Northern, Upper East and Upper West. According to the population and housing census in 2021, Ghana's population is estimated to be about 30.8 million.

3.3.1 Data preparation

For data cleaning, variables that had no responses were categorized as one for the data analysis. Also, variables such as the "age" of the respondent needed to be categorized. Data collected on alcohol use; frequency of condom use across the partner types were categorized. Missing values, outliers, and inconsistencies in key variables were checked.

3.4 Summary of IBBSS 2023

Data were collected through the Integrated Biological and Behavioral Surveillance Survey (IBBSS) using a respondent-driven sampling (RDS). Respondent-driven sampling is a popular snowball sampling approach where respondents are drawn from a social network of existing participants in the sample rather than a sampling frame (McCreesh et al., 2013). The research was carried out in Ghana's 10 former regions, namely Western, Central, Eastern, Greater Accra, Volta, Ashanti, Brong Ahafo, Northern, Upper East, and Upper West. In each region, a team of 5 to 7 individuals was selected (these are key population members who met the eligibility criteria, identified through formative assessment or nominated by stakeholders and MSM community leaders, well-connected within their social networks, well-regarded by their peers, supportive of the survey's goals, in separate social networks and not members of CBOs or NGOs), trained, and given 3 coded recruitment coupons each. These individual seeds were asked to give these coupons to persons within their social network. Potential respondents who were recruited by the seeds were

screened for eligibility and enrolled if they met the survey inclusion criteria and further consented to participate. After participating in the survey, these individuals are also given recruitment coupons and asked to distribute them to their peers. This process continues until the target sample size and survey parameters are achieved. Each cycle of recruitment and participation adds a sampling wave and effectively creates recruitment chains. The number of recruits per person was restricted to 3 to facilitate long chains, which helps the recruitment of diverse social networks. Participants were uniquely identified using a fingerprint scanner and unique code to avoid duplicates. Participants completed structured survey questionnaires, with the option to use computer-assisted personal interviewing (CAPI) software. The process of collecting the data was carefully managed to uphold strict standards of confidentiality. No personal or identifiable information that could link participants to the research was recorded.

3.5 Description of Study Variables

3.5.1 Outcome variable

The outcome variable is consistent condom use. Consistent condom use was defined as condom use during every sexual encounter over the past 6 months. Consistent condom use was measured for the various partner types: regular, non-regular, and paying partners.

3.6 Independent variable

The independent variable was alcohol use. Alcohol use was defined as those who consume alcohol daily or at least once a week.

3.7 Data analysis

The analysis was done using STATA IC version 16. Cleaned and relevant data to meet the objectives of the study was extracted from the 2022 IBBSS dataset. This was made up of MSM data on socio-demographics, sexual behavior, alcohol use, condom use and accessibility, PrEP,

and PEP. The data collected was summarized using frequencies and proportions to serve as background information for the study. Sampling weight was added to the data during analysis. For objective one, which is to determine the association between alcohol use and consistent condom use among regular, non-regular and paying partners, firstly, alcohol use variable was classified into users and non-users. Participants who reported to drink alcohol daily, more times a week, 2-3 times a week, 2-4 times a week were classified as users whereas those who reported to never drink alcohol, monthly or less and those who failed to response were classified as non-users. On the other hand, consistent condom use was described as participants who reported to use condoms "always'' and all other responses were classified as not using condoms consistently. This was done for condom use among regular, non –regular and paying partners. The Pearson's Chi-Square test at 5% significance level was then conducted to test for this association. For objective two, there was a further Pearson's Chi-Square test analysis done at the same significance level to test for association between the socio-demographic variables, namely, sexual orientation, self-identified gender, age, educational level, marital status, occupation region, cohabitation status, and sexual attraction, and consistent condom use among the different partner types. For objective three, which was concerned with the extent to which alcohol use and sociodemographic factors influence consistent condom use among the different partner types, all significant variables were further analyzed using simple logistic regression at a 5% significance level and a confidence interval of 95% to find the crude odds ratio. A multiple logistic regression analysis was then carried out at a 5% significance level and a confidence interval of 95% to determine the adjusted odds ratios and to further determine the strength of the associations after adjusting for age, religion, occupation, self – identified gender, educational level, region, cohabitation status, and sexual attraction.

3.8 Ethical Considerations

The parent study, which is the IBBSS 2022, obtained ethical approval was obtained from Ghana Health Service (GHS-ERC:007/01/22) and Noguchi Memorial Institute for Medical Research (NMIMR-IRB CPN 028/21-22). All individuals involved in the study provided informed consent before participation. Participation was entirely voluntary, and the consent process was clearly explained to ensure participants made an informed and willing choice to take part. They were also informed of their right to withdraw from the study at any stage without any consequences.

CHAPTER FOUR

RESULTS

4.0 Introduction

Data collected during the research process is analyzed using appropriate statistical methods. This section aims to provide an objective presentation of the data, highlighting key patterns, trends, or relationships observed. Following the presentation of results, the analysis includes an interpretation of these findings in relation to the research questions.

Table 1 shows that the total participants in the study were 3,588. The Greater Accra region had the largest number of participants, contributing 20% (717 /3,588), whilst the Upper West region had the fewest participants, with only 86/3588) recruited for the study. The average age of the participants was 24.75 ± 5.13 years. The majority of the participants, 91% (3,165/3,494), self-identified as males. Regarding sexual orientation, just more than half, 51% (1,793/3,494) identified as bisexual, with only 1% (18/3,494) identifying as transgender. A greater portion, 65% (2,264/3,494), was attracted only to or mostly to men. In terms of education, 53% (1,858/3,494) had secondary school-level education, while only 1% (38/3,494) had no formal education. A large number of the participants (3,240/3,494) were single or never married and 84% (2,927/3,494) of them do not live with a partner. The majority, 71% (2,485/3,493) of participants were Christians. Also, the majority of the participants (1,044/3,494) were unemployed. Lastly, most of the participants (1,787/3,492) were of Akan ethnicity.

Table 1: Sociodemographic characteristics of MSM

Variable	Frequency (N)	Percentage (%)
Region name		
Greater Accra	717	19.99
Ashanti	459	12.79
Volta	333	9.29
Western	562	15.65
Eastern	408	11.36
Central	327	9.12
Brong Ahafo	404	11.25
Northern	202	5.63
Upper East	90	2.51
Upper West	86	2.40
Age		
Mean age = 24.75 ± 5.13 years		
Less than 20	422	12.08
20-24	1639	46.92
25-34	1269	36.33
35 and above	163	4.67
Self-identified gender		
Male	3165	90.59
Female	318	9.11
Don't know	3	0.09
Prefer not to answer	7	0.21
Sexual orientation		
Gay/Homosexual/ Lesbian	1608	46.02
Bisexual	1793	51.32
Transgender	18	0.51
Other	48	1.37
Don't know	8	0.24
Prefer not to answer	19	0.54
Sex attracted to most		
Only male	1070	30.62
Mostly male	1194	34.18
Equally male and female	981	28.08
Mostly female	233	6.68
Don't know	5	0.13
Prefer not to answer	11	0.32
Educational level		
No formal education	38	1.09
Primary school	117	3.35
Junior High School	782	22.37
Secondary School	1858	53.18
Tertiary /Higher	699	20.01

Marital status		
Single never married	3240	92.80
Married / Cohabiting	207	5.94
Separated /Divorced	34	0.98
Widowed	5	0.13
Don't know	2	0.05
Prefer not to answer	4	0.11
Cohabitation status		
No	2,927	83.92
Yes	561	16.08
Religion		
No Religion	222	6.35
Christian	2485	71.14
Muslim	638	18.27
Traditional	137	3.91
Other	11	0.33
Occupation		
None / Unemployed	1044	29.88
Professional/ Managerial	371	10.60
Clerical	15	0.44
Service	317	9.08
Artisan	561	16.06
Agricultural / Fishing	32	0.93
Uniform Service	27	0.77
Sex worker	1	0.03
Art/ Entertainment	34	0.96
Commercial Driver	127	3.64
Peer educator	74	2.12
Student	279	7.99
Trader	115	3.30
Beauty/ Fashion	90	2.57
Other	381	10.89
Don't Know	5	0.15
Prefer not to answer	20	0.58
Ethnicity		
Akan	1787	51.18
Ga/Dangme	403	11.53
Ewe	493	14.12
Guan	62	1.79
Mole-Dagbani	320	9.17
Grussi	85	2.44
Gruma	12	0.33
Mixed	7	0.21
Other	313	8.97
Prefer not to say	9	0.27

Table 2 presents the sexual behaviors based on the different types of sexual partners. Among the participants, 89% (3,204/3,588) reported having a regular partner, and 49.65 % used condoms with their regular partners. Also, for non-regular partners, 37% (801/2183) used condoms always when having sex. Furthermore, for paying partners, 44 % (1547/3483) received money or goods for sex, and 34% (517/1512) used condoms always with their paying partners.

Table 2: Sexual behavior of the study participants in the last 6 months based on different sexual partners; regular, non-regular and paying partners.

REGULAR PARTNERS		
Variable	**Frequency ,N**	**Percentage ,%**
Had a regular partner		
No	289	8.04
Yes	3204	89.31
Non-response	95	2.65
Frequency of condom use with regular partners		
Always	861	49.65
Sometimes	844	48.67
Never	29	1.67
NON-REGULAR PARTNER		
Condom use with non-regular partner during last anal sex		
No	739	34.00
Yes	1379	63.45
Don't know	41	1.88
Prefer not to answer	14	0.67
Frequency of condom use with non - regular partners		
Always	801	36.69
Sometimes	1053	48.24
Never	269	12.32
Non –response	60	2.75
PAYING PARTNERS		
Ever received money or goods for sex		
No	1909	54.82
Yes	1547	44.40
Don't know	12	0.33
Prefer not to answer	15	0.44

Frequency of condom use among paying partners		
Always	517	34.19
Sometimes	769	50.86
Never	196	12.96
Non –response	30	1.98

Table 3 illustrates alcohol use among MSM. Over half of the participants, 58% (2,073/3,588) reported never drinking alcohol.

Table 3: Alcohol use among MSM

Variable	**Frequency**	**Percentage %**
How often do you drink alcohol		
Never	2073	57.78
Monthly or less	754	21.01
2-4 times a month	346	9.64
2-3 times a week	225	6.27
More times a week	56	1.56
Daily	28	0.78
Non- response	106	2.95

Table 4 shows the condom use and accessibility among MSM. 93% (3256/3484) reported that they can get themselves a male condom and, also 92% (3184/3457) can ask their regular partner to use condoms during sexual encounters. 52% (1798/3469) indicated that they do not have enough condoms to use for sex with their non-regular partners.

Table 4: Condom use and accessibility among study participants

Variable	Frequency, N	Percentage %
Self-obtained male condom		
No	228	6.54
Yes	3256	93.46
Condom negotiation with regular partner		
No	276	7.97
Yes	3184	92.03
Enough condoms to use each time for intercourse with a non-regular partner		
No	1798	51.84
Yes	1671	48.16

Table 5 shows the Chi-Square analysis for an association between the use of alcohol and consistent condom use among the different partner types. It also shows the same for sociodemographic factors and consistent condom use among these different partner types. The results also show that there is a significant association between educational level and consistent condom use among regular partners (χ^2 = 22.16, p <0.001), non-regular partners (χ^2 = 19.57, p <0.001), and paying partners (χ^2 = 15.49, p = 0.008). There is an association between age and consistent condom use among regular (χ^2 = 11.95, p = 0.008), non-regular (χ^2 = 12.04, p = 0.007) and paying partners (χ^2 = 11.03, p = 0.012). For MSM in regular relationships, there is a significant association between their marital status and the consistent use of condoms (χ^2 = 13.78, p = 0.008). Moreover, religion was a found to be significantly associated with condom use among all partner types (regular partners χ^2 = 14.32, p = 0.006, non-regular partners χ^2 = 11.88, p = 0.018, paying partners χ^2 = 11.72, p = 0.020). In addition, the results from the table showed that occupation was significantly associated with condom use (regular partners χ^2 = 41.16, p = 0.001, non-regular partners χ^2 = 61.36, p < 0.001, paying partners χ^2 =30.59, p = 0.015). Furthermore, geographical region was also found significantly associated with condom use among MSM (regular partners χ^2 = 145.63, p < 0.001, non-regular partners χ^2 =88.49, p < 0.001, paying partners χ^2 =28.98, p = 0.001). Lastly, sexual

attraction was significantly associated with consistent condom use among regular and non-regular MSM relationship.

Table 5: Chi –Square association between alcohol and other sociodemographic variables and condom use among different partner types

Variable	Consistent Condom Use- Regular partners			Consistent CondomUse- Non-regular partners			Consistent CondomUse-Paying partners		
	Yes (%)	**No (%)**	**χ^2 (p-value)**	**Yes (%)**	**No (%)**	**χ^2 (p-value)**	**Yes (%)**	**No (%)**	**χ^2 (p-value)**
Alcohol Use			**1.96 (0.161)**			**0.62 (0.430)**			**0.27 (0.61)**
Non-user	682 (26.19)	1,922 (73.81)		160 (38.37)	1125 (63.70)		403 (33.87)	787 (66.13)	
User	179 (28.96)	439 (71.04)		801 (36.69)	257 (61.63)		114 (35.40)	208 (64.60)	
Age			**11.95(0.008)**			**12.04(0.007)**			**11.03(0.012)**
Less than 20	88 (22.80)	298 (77.20)		78(28.06)	200(71.94)		64(30.48)	146(69.52)	
20-24	375(25.07)	1121(74.93)		371(36.66)	641(63.34)		228(31.23)	502(68.77)	
25-34	356(30.07)	828(69.93)		310(38.99)	485(61.01)		201(38.80)	317(61.20)	
35 and above	40(25.97)	114(74.03)		41(42.27)	56(57.73)		23(43.40)	30(56.60)	
Sexual orientation			**3.74 (0.291)**			**1.65 (0.647)**			**0.87 (0.83)**
Gay/Homosexual/ Lesbian	380 (25.52)	1109 (74.48)		374 (37.85)	614 (62.15)		250 (33.92)	487 (66.08)	
Bisexual	456 (27.98)	1174 (72.02)		408 (35.95)	727 (64.05)		258 (34.58)	488 (65.42)	
Transgender	5 (17.24)	24 (82.76)		8 (34.78)	15 (65.22)		3 (23.08)	10 (62.50)	
Other	20 (27.03)	54 (72.97)		11 (29.73)	26 (70.27)		6 (37.50)	10 (65.81)	

Self-identified gender			**40.34 (<0.001)**			**7.06 (0.029)**			**2.54 (0.280)**
Male	818 (28.43)	2059 (71.57)		709 (37.02)	1206 (62.98)		453 (34.95)	843 (65.05)	
Female	41 (12.77)	280 (87.23)		91 (36.25)	160 (63.75)		63 (29.86)	148 (70.14)	
Don't know	2 (8.33)	22 (91.67)		1 (5.88)	16 (94.12)		1 (20.00)	4 (80.00)	
Educational level			**22.16 (<0.001)**			**19.57 (0.001)**			**15.49 (0.008)**
No formal education	8 (18.18)	36 (81.82)		9 (25.00)	27 (75.00)		3 (18.75)	13 (81.25)	
Primary school	22 (18.03)	100 (81.97)		25 (30.86)	56 (69.14)		17 (27.42)	45 (72.58)	
Junior High School	153 (21.95)	544 (78.05)		146 (30.04)	340 (69.96)		103 (28.14)	263 (71.86)	
Secondary School	484 (28.45)	1217 (71.55)		455 (38.24)	735 (61.76)		299 (35.94)	533 (64.06)	
Tertiary /Higher	193 (29.38)	464 (70.62)		166 (42.56)	224 (57.44)		94 (40.00)	141 (60.00)	
Marital status			**13.78 (0.008)**			**3.34 (0.503)**			**2.48 (0.645)**
Single never married	791 (26.73)	2168 (73.27)		746 (36.88)	1277 (63.12)		484 (34.35)	925 (65.65)	
Married / Cohabiting	61 (28.77)	151 (71.23)		45 (35.71)	81 (64.29)		27 (32.14)	57 (67.86)	

Separated /Divorced	4 (11.11)	32 (88.89)		6 (23.08)	20 (76.92)		2 (20.00)	8 (80.00)	
Widowed	3 (100)	0 (0.00)		2 (66.67)	1 (33.33)		0 (0.00)	1 (100.0)	
Non-response	2 (16.67)	10 (83.33)		2 (40.00)	3 (60.00)		4 (50.00)	4 (50.00)	
Religion			**14.32 (0.006)**			**11.88 (0.018)**			**11.72 (0.020)**
No Religion	45 (23.94)	143 (76.06)		46 (33.33)	92 (66.67)		36 (39.56)	55 (60.44)	
Christian	634 (28.66)	1578 (71.34)		584 (38.99)	914 (61.01)		397 (35.61)	718 (64.39)	
Muslim	152 (21.97)	540 (78.03)		140 (30.43)	320 (69.57)		66 (26.29)	185 (73.71)	
Traditional	26 (22.03)	92 (77.97)		28 (35.90)	50 (64.10)		17 (34.69)	32 (65.31)	
Other	3 (27.27)	8 (72.73)		3 (33.33)	6 (66.67)		0 (0.00)	5 (100)	
Occupation			**41.16 (0.001)**			**61.36 (<0.001)**			**30.59 (0.015)**
None / Unemployed	241 (22.54)	828 (77.46)		207 (28.71)	514 (71.29)		144 (30.77)	325 (69.30)	
Professional/ Managerial	93 (30.29)	214 (69.71)		81 (37.50)	135 (62.50)		60 (37.97)	98 (62.03)	
Clerical	2 (22.22)	7 (77.78)		1 (14.29)	6 (85.71)		2 (25.00)	6 (75.00)	
Service	78 (29.77)	184 (70.23)		50 (38.17)	81 (61.83)		28(27.45)	74 (72.55)	
Artisan	131 (25.34)	386 (74.66)		144 (41.26)	205 (58.74)		74 (30.96)	165 (69.04)	
Agricultural / Fishing	8 (21.62)	29 (78.38)		10 (33.33)	20 (66.67)		4 (25.00)	12 (75.00)	
Uniform Service	4	18		6	12		4	6	

	(18.18)	(81.82)		(33.33)	(66.67)		(40.00)	(60.00)	
Sex worker	0 (0.00)	3 (100.00)		0 (0.00)	3 (100.0)		0 (0.00)	2 (100.0)	
Art/ Entertainment	11 (25.58)	32 (74.42)		11 (34.38)	21 (65.63)		6 (30.00)	14 (70.00)	
Commercial Driver	39 (31.45)	85 (68.55)		32 (34.04)	62 (65.96)		26 (41.94)	36 (58.06)	
Peer educator	35 (45.45)	42 (54.55)		36 (66.67)	18 (33.33)		26 (55.32)	21 (44.68)	
Student	69 (29.11)	168 (70.89)		78 (44.07)	99 (55.93)		43 (40.57)	63 (59.43)	
Trader	33 (38.37)	53 (61.63)		31 (50.00)	31 (50.00)		26 (53.06)	23 (46.94)	
Beauty/ Fashion	21 (23.60)	68 (76.40)		19 (33.33)	38 (66.67)		17 (36.17)	30 (63.83)	
Other	90 (28.04)	231 (71.96)		88 (39.82)	133 (60.18)		55 (31.98)	117 (68.02)	
Don't Know	0 (0.00)	5 (100)		2 (66.67)	1 (33.33)		0 (0.00)	1 (100.0)	
Prefer not to answer	5 (38.46)	8 (61.54)		5 (62.50)	3 (37.50)		1 (33.33)	2 (66.67)	
Region name			**145.63 (<0.001)**			**88.49 (<0.001)**			**28.98 (0.001)**
Greater Accra	130 (20.16)	515 (79.84)		127 (29.74)	300 (70.26)		139 (32.03)	`295 (67.97)	
Ashanti	124 (25.94)	354 (74.06)		151 (40.37)	223 (59.63)		99 (33.13)	200 (66.89)	
Volta	99 (38.98)	155 (61.02)		49 (41.18)	70 (58.82)		30 (33.71)	59 (66.29)	
Western	131 (39.82)	198 (60.18)		102 (49.76)	103 (50.24)		66 (43.42)	86 (56.58)	

Eastern	76(28.15)	194 (71.85)		79 (37.09)	134 (62.91)		56 (35.44)	102 (64.56)	
Central	107(33.97)	208 (66.03)		107 (43.32)	140 (56.68)		53 (43.80)	68 (56.20)	
Brong Ahafo	109 (34.94)	203 (65.06)		105 (47.30)	117 (52.70)		51 (38.06)	83 (61.94)	
Northern	44 (20.28)	173 (86.07)		40 (31.25)	88 (68.75)		12 (19.67)	49 (80.33)	
Upper East	28 (13.93)	173 (86.07)		14 (13.21)	92 (86.79)		8 (26.67)	22 (73.33)	
Upper West	13 (6.47)	188 (93.53)		27 (19.01)	115 (80.99)		3 (8.82)	31 (91.18)	
Cohabitation status			**4.12 (0.127)**			**6.06 (0.048)**			**3.99 (0.136)**
No	691 (26.05)	1962 (73.95)		638 (35.52)	1158 (64.48)		421 (33.90)	821 (66.10)	
Yes	167 (29.72)	395 (70.28)		162 (42.19)	222 (57.81)		94 (35.07)	174 (64.93)	
Sexual attraction			**16.18 (0.003)**			**13.81 (0.008)**			**2.46 (0.652)**
Only male	251 (27.11)	675 (72.89)		256 (40.89)	370 (59.11)		178 (35.89)	318 (64.11)	
Mostly male	276 (24.45)	853 (75.55)		265 (34.60)	501 (65.40)		159 (159)	344 (68.39)	
Equally male and female	288 (30.48)	657 (69.52)		229 (37.06)	389 (62.94)		144 (35.38)	263 (64.62)	
Mostly female	43 (22.51)	148 (77.49)		49 (32.03)	104 (67.97)		33 (34.38)	63 (65.63)	
Non- response	3 (9.68)	28 (90.32)		2 (10.00)	18 (90.00)		3 (30.00)	7 (70.00)	

Table 6 shows the results of a logistic regression of alcohol use, sociodemographic factors, and consistent condom use among regular partners. The result from both crude and adjusted model analysis on the table showed no association between alcohol and consistent condom use among regular partners (cOR: 1.15, 95% CI: 0.95 – 1.40, p=0.161; aOR: 1.08, 95% CI: 0.88 -1.33, p=0.451). MSM who are between 25 to 34 years are more likely to use condoms with their regular partners (aOR =1.37, 95%CI: 1.21-2.35). Peer educators (aOR: 2.53, 95% CI: 1.79–4.59, p < 0.000) are about thrice more likely to use condoms consistently, even in their regular partnership. The table also shows that geographical region is significantly associated with condom use, and thus, MSM from the various regions showed an increased odds of using condoms consistently.

Table 6: Logistic Regression of alcohol use, sociodemographic factors and condom use among regular partners

Variable	cOR (95% CI)	p-Value	aOR (95% CI)	p-Value
Alcohol use``				
No	Ref	Ref	Ref	Ref
Yes	1.15 (0.95-1.40)	0.161	1.08 (0.88-1.33)	0.451
Age				
Less than 20	Ref	Ref	Ref	Ref
20-24	1.13 (0.87-1.48)	0.356	1.03 (0.93-1.51)	0.444
25-34	1.46 (1.11-1.90)	0.006	1.37 (1.21-2.35)	0.013
35 and above	1.19(0.77-1.83)	0.434	1.11 (0.84- 1.55)	0.403
Self-identified gender				
Don't know	Ref	Ref	Ref	Ref
Male	4.37 (1.03 -18.63)	0.046	3.53 (0.42 - 29.41)	0.244
Female	1.61 (0.37 - 7.11)	0.529	1.45 (0.17 - 12.33)	0.734
Educational level				
No formal education	Ref	Ref	Ref	Ref
Primary school	0.99 (0.40 - 2.42)	0.982	0.88 (0.35 - 2.22)	0.791
Junior High School	1.27 (0.58 - 2.78)	0.557	1.03 (0.46 - 2.34)	0.936
Secondary School	1.79 (0.83 - 3.88)	0.140	1.47 (0.66 - 3.28)	0.351
Tertiary /Higher	1.87 (0.85 - 4.10)	0.117	1.58 (0.70 - 3.60)	0.273
Marital status				
Single never married	1.82 (0.40 - 8.34)	0.438	2.32 (0.28-18.94)	0.431
Married / Cohabiting	2.02 (0.43 - 9.49)	0.373	2.64 (0.32-21.96)	0.369
Separated /Divorced	0.62 (0.10 - 3.93)	0.617	0.84 (0.08 - 8.80)	0.887

Religion				
No Religion	Ref	Ref		
Christian	1.28 (0.90 - 1.81)	0.168	1.23 (0.84 - 1.77)	0.277
Muslim	0.89 (0.61 - 1.31)	0.565	1.46 (0.95 - 2.23)	0.084
Traditional	0.90 (0.52 - 1.56)	0.701	0.95 (0.53 - 1.70)	0.869
Other	1.19 (0.30 - 4.68)	0.802	1.20 (0.29 - 4.93)	0.805
Occupation				
None / Unemployed	Ref	Ref	Ref	Ref
Professional/ Managerial	1.49 (1.13-1.98)	0.005	1.29(0.96-1.75)	0.093
Clerical	0.98 (0.20 - 4.76)	0.982	0.78 (0.15 - 3.89)	0.757
Service	1.46 (1.08 - 1.97)	0.014	1.14 (0.83 - 1.57)	0.409
Artisan	1.17 (0.91 - 1.49)	0.219	0.99 (0.76 - 1.28)	0.926
Agricultural / Fishing	0.95 (0.43 - 2.10)	0.895	0.87 (0.38 - 1.98)	0.739
Uniform Service	0.76 (0.26 - 2.28)	0.628	0.61 (0.20 - 1.85)	0.379
Art/ Entertainment	1.18 (0.59 - 2.38)	0.641	1.40 (0.67 - 2.93)	0.365
Commercial Driver	1.58 (1.05 - 2.36)	0.028	1.34 (0.88-2.06)	0.173
Peer educator	2.86 (1.79 - 4.59)	< 0.000	2.52 (1.53-4.13)	<0.001
Student	1.41 (1.03 - 1.93)	0.032	1.15 (0.83-1.61)	0.400
Trader	2.13 (1.35 - 3.38)	0.001	1.76 (1.08-2.86)	0.023
Beauty/ Fashion	1.06 (0.64 - 1.77)	0.820	1.01 (0.59-1.71)	0.981
Other	1.34 (1.01 - 1.78)	0.043	1.34 (0.99-1.81)	0.062
Prefer not to answer	2.15 (0.70 - 6.62)	0.184	1.21 (0.38-3.87)	0.794
Region name				
Greater Accra	3.65 (2.02 - 6.61)	<0.001	3.89 (2.06 - 7.35)	<0.001
Ashanti	5.07 (2.79 - 9.21)	<0.001	5.72 (2.01 -10.86)	<0.001
Volta	9.24 (4.99 -17.10)	<0.001	9.72 (4.99 - 18.91)	<0.001
Western	9.57 (5.23 -17.50)	<0.001	10.75(5.66 - 20.41)	<0.001
Eastern	5.67 (3.04 - 10.55)	<0.001	5.42 (2.79 - 10.53)	<0.001
Central	7.44 (4.05 - 13.67)	<0.001	7.68 (3.98 - 14.80)	<0.001
Brong Ahafo	7.77 (4.23 - 14.27)	<0.001	7.49 (3.93 - 14.27)	<0.001
Northern	3.68 (1.92 - 7.86)	<0.001	3.54 (1.82 - 6.87)	<0.001
Upper East	2.34 (1.17 - 4.66)	0.016	3.56 (1.71 - 7.41)	0.001
Upper West	Ref	Ref	Ref	Ref
Sexual attraction				
Only male	3.47 (1.05 - 11.52)	0.042	2.12 (0.44 - 10.19)	0.346
Mostly male	3.02 (0.91 - 10.01)	0.071	1.86 (0.39 - 8.92)	0.435
Equally male and female	4.09 (1.23 - 13.57)	0.021	2.32 (0.48 - 11.09)	0.294
Mostly female	2.71 (0.79 - 9.35)	0.114	1.49 (0.30 - 7.42)	0.625

Table 7 presents logistic regression of alcohol use, sociodemographic factors, and condom use among non-regular partners. Likewise, results from both crude and adjusted model analyses on the table showed no association between alcohol use and the consistent use of condom among non-regular partners (cOR: 1.09, 95% CI: 0.88 – 1.36, p = 0.430; aOR: 1.02, 95% CI: 0.81 -1.29, p=0.840). The table shows that MSM with tertiary or higher education are twice more as likely to use condoms with their non-regular partners to those with no formal education (aOR: 2.22; 95% CI: 0.98–5.07). In terms of occupation, individuals who worked as peer educators had 4 times higher likelihood of using condoms with their non–regular partners to those who were unemployed (aOR: 4.11; 95% CI: 2.24 - 7.53; p-value < 0.001). MSM from all the regions, excluding the Upper East region (aOR: 0.64; 95% CI: 0.29 - 1.39), showed an increased odds of using condoms consistently in the adjusted model. Individuals who were predominantly attracted to females (aOR: 0.66;95% CI: 0.44 - 0.99) were 34% less likely to use condoms consistently than individuals who were attracted to mostly males.

Table 7: Logistic Regression of alcohol use, sociodemographic factors, and condom use among non-regular partners

Variable	cOR (95% CI)	p-value	aOR (95% CI)	p-value
Alcohol use``				
No	Ref	Ref	Ref	Ref
Yes	1.09(0.88-1.36)	0.430	1.02 (0.81-1.29)	0.840
Age				
Less than 20	Ref	Ref	Ref	Ref
20-24	1.48 (1.11-1.99)	0.008	1.33(0.92- 1.95)	0.411
25-34	1.64 (1.22-2.21)	0.001	1.58 (1.33- 2.75)	0.255
35 and above	1.88 (1.16-3.03)	0.010	1. 75(0.99 -2.88)	0.039
Self-identified gender				
Male	9.41 (1.24 - 71.08)	0.030	1.07 (0.79 - 1.45)	0.669
Female	9.10 (1.19 - 69.75)	0.034	0.42 (0.05 - 3.68)	0.436
Educational level				
No formal education	Ref	Ref	Ref	Ref
Primary school	1.34 (0.55 - 3.26)	0.520	1.25 (0.50 - 3.14)	0.636

Junior High School	1.28 (0.59 - 2.81)	0.524	1.16 (0.51 - 2.60)	0.724
Secondary School	1.86 (0.87 - 3.98)	0.112	1.72 (0.78 - 3.83)	0.182
Tertiary /Higher	2.22 (1.02 - 4.86)	0.045	2.22 (0.98 - 5.07)	0.053
Religion				
No Religion	Ref	Ref	Ref	Ref
Christian	1.28 (0.88 - 1.85)	0.193	1.09 (0.73 - 1.62)	0.670
Muslim	0.88 (0.58 - 1.31)	0.519	0.99 (0.62 - 1.57)	0.954
Traditional	1.12 (0.63 - 2.01)	0.703	1.25 (0.67 - 2.33)	0.484
Other	1.00 (0.24 - 4.18)	1.000	0.74 (0.16 - 3.45)	0.701
Occupation				
None / Unemployed	Ref	Ref	Ref	Ref
Professional/Managerial	1.49 (1.08 - 2.05)	0.014	1.24 (0.88 - 1.74)	0.212
Clerical	0.41 (0.05 - 3.46)	0.415	0.26 (0.03 - 2.25)	0.222
Service	1.53 (1.04 - 2.26)	0.031	1.31 (0.87 - 1.96)	0.194
Artisan	1.74 (1.34 - 2.28)	<0.001	1.61 (1.21 - 2.14)	0.001
Agricultural / Fishing	1.24 (0.57 - 2.70)	0.585	1.31 (0.58 - 2.94)	0.516
Uniform Service	1.24 (0.46 - 3.35)	0.669	1.01 (0.36 - 2.82)	0.992
Art/ Entertainment	1.30 (0.62 - 2.75)	0.490	1.45 (0.67 - 3.14)	0.351
Commercial Driver	1.28 (0.81 - 2.02)	0.286	1.14 (0.71 -1 .84)	0.588
Peer educator	4.97 (2.76 - 8.94)	<0.001	4.11 (2.24 - 7.53)	<0.001
Student	1.96 (1.40 - 2.74)	<0.001	1.50 (1.05 - 2.16)	0.027
Trader	2.48 (1.47 - 4.19)	0.001	2.11 (1.23 - 3.63)	0.007
Beauty/ Fashion	1.24 (0.70 - 2.20)	0.460	1.23 (0.68 - 2.25)	0.485
Other	1.64 (1.20 - 2.25)	0.002	1.66 (1.18 - 2.32)	0.003
Don't Know	4.96 (0.45 - 55.07)	0.192	6.77 (0.56 - 82.56)	0.134
Prefer not to answer	4.14 (0.98 - 17.47)	0.053	2.87 (0.63 - 13.13)	0.173
Region name (n= 3588)				
Greater Accra	1.80 (1.12 - 2.88)	0.013	1.33 (0.78 - 2.26)	0.297
Ashanti	2.88 (1.81 - 4.60)	<0.001	1.89 (1.01 - 3.22)	0.020
Volta	2.98 (1.71 - 5.20)	<0.001	2.19 (1.17 - 4.09)	0.014
Western	4.22 (2.56 - 6.96)	<0.001	3.62 (2.09 - 6.28)	<0.001
Eastern	2.51 (1.52 - 4.15)	<0.001	2.04 (1.17 - 3.56)	0.012
Central	3.26 (2.00 - 5.31)	<0.001	2.64 (1.51 - 4.60)	0.001
Brong Ahafo	3.82 (2.33 - 6.27)	<0.001	2.80 (1.62 - 4.85)	<0.001
Northern	1.94 (1.10 - 3.39)	0.021	1.73 (0.97 - 3.11)	0.065
Upper East	0.65 (0.32-1.31)	0.226	0.64 (0.29 - 1.39)	0.257
Upper West	Ref	Ref	Ref	Ref
Living with partner				
No	Ref	Ref	Ref	Ref
Yes	1.32 (1.06 - 1.66)	0.014	1.29 (1.01 - 1.64)	0.842
Sexual attraction				
Only male	Ref	Ref	Ref	Ref
Mostly male	0.76 (0.61 - 0.95)	0.016	0.78 (0.62 - 0.98)	0.034

Equally male and female	0.85 (0.68 - 1.07)	0.165	0.83 (0.65 - 1.06)	0.134
Mostly female	0.68 (0.04 - 0.70)	0.045	0.66 (0.44 - 0.99)	0.044

Table 8 shows logistic regression of condom use by alcohol use and sociodemographic factors among paying partners of MSM in Ghana. Similarly, results showed no association between alcohol use and consistent condom use among non-regular partners (cOR: 1.09, 95% CI: 0.88 – 1.36, p = 0.430; aOR: 1.02, 95% CI: 0.81 -1.29, p=0.840). MSM who are 35 and above are twice more likely to use condoms with their paying partners (aOR= 1.63 , 95% CI : 1.14- 2.76) .Peer educators were about 3 times more likely to use condoms with their paying partners (aOR:2.66, 95% C.I.:1.42- 4.99, p = 0.002). Finally, the results also showed that, MSM from Greater Accra , Volta , Western , Ashanti , Central , Upper West, Brong Ahafo and Eastern were more likely to use condoms consistently with their paying partners.

Table 8: Logistic regression of condom use by alcohol use and sociodemographic factors among paying partners of MSM in Ghana

Variable	cOR (95% CI)	p-value	aOR (95% CI)	p-value
Alcohol use				
No	Ref	Ref	Ref	Ref
Yes	1.07(0.83-1.39)	0.606	1.02(0.75-1.29)	0.893
Age				
Less than 20	Ref	Ref	Ref	Ref
20-24	1.48 (1.11-1.99)	0.008	1. 35 (0.77- 1.85)	0.082
25-34	1.64 (1.22-2.21)	0.001	1.44 (0.82- 3.03)	0. 061
35 and above	1.88 (1.16-3.03)	0.010	1.63(1.14- 2.76)	0. 022
Educational level				
No formal education	Ref	Ref	Ref	Ref
Primary school	1.64 (0.41 - 6.47)	0.482	1.97 (0.47 - 8.26)	0.353
Junior High School	1.70 (0.47 - 6.08)	0.417	1.97 (0.52 - 7.48)	0.320
Secondary School	2.43 (0.69 - 8.60)	0.168	2.89 (0.77 - 10.94)	0.116
Tertiary /Higher	2.89 (0.80 -10.41)	0.105	3.58 (0.92 -13.87)	0.065
Religion				
No Religion	Ref	Ref	Ref	Ref
Christian	0.84 (0.55 - 1.31)	0.450	0.83 (0.52 - 1.32)	0.438
Muslim	0.55 (0.33 - 0.90)	0.019	0.74 (0.43 - 1.28)	0.278
Traditional	0.81 (0.39 - 1.67)	0.571	0.88 (0.41- 1.87)	0.737
Occupation				
None / Unemployed	Ref	Ref	Ref	Ref
Professional/ Managerial	1.38 (0.95- 2.01)	0.092	1.32 (0.90-1.96)	0.159
Clerical	0.75 (0.15 - 3.77)	0.729	0.59 (1.12 - 3.04)	0.532

Service	0.85 (0.53 - 1.38)	0.517	0.84 (0.51 - 1.36)	0.468
Artisan	1.01 (0.72 - 1.42)	0.944	1.06 (0.75 - 1.51)	0.737
Agricultural / Fishing	0.75 (0.24 - 2.37)	0.627	0.85 (0.26 - 2.75)	0.785
Uniform Service	1.50 (0.42 - 5.41)	0.532	1.11 (0.30 - 4.07)	0.873
Art/ Entertainment	0.97 (0.36 - 2.57)	0.947	1.14 (0.41 - 3.71)	0.796
Commercial Driver	1.63 (0.95 - 2.80)	0.077	1.50 (0.86 - 2.62)	0.154
Peer educator	2.79 (1.52 - 5.13)	0.001	2.66 (1.42 - 4.99)	0.002
Student	1.54 (1.00 - 2.38)	0.051	1.36 (0.86 - 2.14)	0.186
Trader	2.55 (1.41 - 4.62)	0.002	2.55 (1.37- 4.75)	0.003
Beauty/ Fashion	1.28 (0.68 - 2.39)	0.441	1.24 (0.65 - 2.37)	0.506
Other	1.06 (0.73 - 1.54)	0.758	1.09 (0.73 - 1.62)	0.659
Prefer not to answer	1.13 (0.10 - 12.56)	0.922	0.87 (0.07 -10.43)	0.913
Region name				
Greater Accra	4.87 (1.46 -16.20)	0.010	4.66 (1.36 -16.01)	0.014
Ashanti	5.11 (1.53 - 17.14)	0.008	4.30 (1.24 -14.92)	0.022
Volta	5.25 (1.48 - 18.60)	0.010	5.21 (1.41 -19.20)	0.013
Western	7.93 (2.32 - 27.07)	0.001	7.56 (2.15 -26.59)	0.002
Eastern	5.67 (1.66 - 19.39)	0.006	4.73 (1.34 -16.75)	0.016
Central	8.05 (2.33 - 27.78)	0.001	7.87 (2.19 -28.31)	0.002
Brong Ahafo	6.35 (1.85 - 21.84)	0.003	5.77 (1.63 -20.39)	0.007
Northern	2.53 (0.66 - 9.69)	0.175	2.97 (0.76 -11.59)	0.117
Upper East	3.76 (0.89 - 15.78)	0.071	4.04 (0.93 - 17.42)	0.061
Upper West	Ref	Ref	Ref	Ref

CHAPTER FIVE

DISCUSSION

5.0 Introduction

The chapter presents findings, comparing them with existing literature and exploring their implications for understanding the correlation between the use of alcohol and consistent condom use.

The study found no association between alcohol use and consistent condom use among MSM in Ghana, regardless of partner type, whether regular, non-regular, or paying partners. The study also found that educational level, age, religious belief, occupation, and geographical region were significantly associated with consistent condom use among regular, non-regular, and paying partners. The findings showed that MSM with higher educational levels are twice more likely to use condoms consistently with their non-regular partners. The study found an association between sexual attraction and condom use among regular and non-regular MSM partner types. Also, the study found an association between age and consistent condom use across the partner types. Another notable finding was that MSM who worked as peer educators were 4 times more likely to use condoms with their non-regular partners.

The lack of association between alcohol and consistent condom use is consistent with some previous research stating that alcohol use is not a significant predictor of condom use among MSM. Martinez et al., 2017 found that alcohol use was not significantly linked to condom use among MSM; instead, factors like access to condoms and the number of sexual partners were more influential. Further reinforcing these findings, a review by Allen et al. (2015), which examined ten studies on the subject, concluded that the majority did not observe a significant association

between alcohol use and consistent condom use. Collectively, these research works suggest that alcohol use may not play a decisive role in determining condom use behavior among MSM, regardless of partner type. Several factors, such as the use of PrEP and PEP, perceived pleasure reduction, mental health challenges, condom fatigue, power dynamics, and condom negotiation skills, might explain this unexpected lack of association. The absence of a link between alcohol use and condom consistency suggests that interventions should prioritize other, more impactful determinants, such as education, occupation, and regional context. Non-Governmental Organizations that work with key populations, like West African AIDs Foundation (WAAF), West African Programme to Combat HIV/STIs (WAPCAS), Center for Popular Education and Human Rights (CEPEHRG), and other stakeholders, can integrate educational and economic empowerment programs in the delivery of their HIV prevention interventions. MSM in Ghana can be provided with vocational skills and other life skills training to empower them to make bold sexual risk reduction choices.

Across all partner types, MSM with higher levels of education were more likely to use condoms consistently. The finding aligns with the study by Kim et al., 2016) , conducted in Uganda, which similarly found that MSM with higher educational attainment reported greater condom use. These results underscore the potential protective role of education in shaping positive sexual health behaviors. Prior research supports this notion, suggesting that higher educational levels are often associated with increased awareness of HIV/STI prevention strategies and safer sexual practices. Consequently, this highlights the importance of educational interventions as a key component in promoting sexual health among MSM. An innovative approach could be the use of online or mobile applications, where information on condom use, discussion forums, quizzes, and videos can be accessed .

Religion also emerged as a significant factor influencing condom use across different partner categories. Although the study did not find this particular association, Ahinkorah et al, 2020 identified a link between religious affiliation and consistent condom use, reporting that Muslim men were less likely (aOR = 0.71) to use condoms consistently during paid sexual encounters compared to their Christian counterparts. Religious beliefs and teachings may play a critical role in shaping attitudes and behaviors related to sex and condom use. As such, engaging religious leaders and institutions in culturally sensitive sexual health campaigns could be a promising approach to improving condom use and the overall reproductive sexual health of MSM.

In addition to this, occupation was found to be significantly associated with the consistent use of condoms, potentially as a result of factors such as income stability, access to workplace-based health education, and varying degrees of exposure to sexual health information across different occupational sectors. Ahinkorah et al. (2020) had similar findings that showed that occupational status, which is one determinant of socioeconomic status, influences HIV preventive behaviors, specifically consistent condom use. Notably, the study emphasized the role of peer educators in promoting good sexual health behaviors. MSM who were employed as peer educators demonstrated a higher likelihood of condom use with different partner types. This association remained significant in both adjusted and unadjusted models, reinforcing the effectiveness of peer-led interventions in promoting safer sexual practices among MSM. The enhanced condom use among peer educators may be attributed to their active participation in health education, their role in disseminating HIV prevention messages, and their improved access to resources such as condoms and lubricants. As trusted members of the community, peer educators can serve as impactful agents of behavioral change. These findings highlight the importance of expanding peer

education programs and warrant further investigation into how peer education interacts with other social and structural determinants of condom use within the MSM population.

The found association between geographical region and consistent condom use among all partner types may reflect differences in accessing condoms, healthcare services, sexual health education, and cultural attitudes towards condom use. It also highlights the need for interventions that are targeted to consider the local cultural, social, and health service factors influencing condom use. More interventions need to be done in the Northern , Central and Western regions of Ghana. Hence, regional differences in infrastructure, healthcare access, cultural norms, and stigma levels could be contributing factors affecting these patterns. These show the importance of region-specific interventions that can address the barriers and facilitators to condom use in different parts of Ghana.

MSM who were attracted predominantly to females had a lower likelihood of consistent condom use than those exclusively attracted to males who identify as homosexuals. This contrasts with a study by Abu-Ba'are et al. (2023) which explored awareness and willingness to use condoms and PrEP among GBMSM in slum communities in Ghana and found that MSM who identified as bisexual or had sexual attraction to both men and women demonstrated higher awareness to use HIV prevention strategies, including condoms and PrEP. This suggests that sexual attraction plays a role in HIV prevention behaviors.

It is also possible that MSM in Ghana, despite the potential negative effects of alcohol, may prioritize condom use for HIV and STI prevention due to awareness campaigns, peer support, or personal health concerns. Educational programs and interventions that emphasize the importance of consistent condom use regardless of alcohol use may help reduce risky behaviours associated

with alcohol consumption. Additionally, the study's findings may reflect the diversity in the motivations and attitudes towards condom use among MSM in Ghana. MSM may adopt different risk-reduction strategies based on their social networks, personal experiences, and perceptions of HIV risk. This variation in behaviour could explain the absence of a strong, consistent association between the use of alcohol and condom use. In interpreting findings, it was crucial to consider the different sociocultural context of MSM in Ghana.

Homosexuality is criminalized in Ghana, and MSM often face social stigma and discrimination. These factors may affect both the willingness of MSM to disclose their sexual behaviours and their access to sexual health education and resources (G. M. Abubakari et al., 2021). In Ghana where MSM are marginalized, the impact of alcohol on condom use may be shaped by factors such as fear of disclosure, lack of access to healthcare services, and social isolation. Alcohol use may be more strongly associated with condom use in certain types of partnerships, such as paying partners, yet this was not evident in the statistical analyses.

Moreover, the level of alcohol consumption among MSM in Ghana might be too low to produce a noticeable impact on sexual behavior. The lack of a significant association between alcohol use and condom use suggests that interventions targeting alcohol use alone may not be enough to address condom use behaviours. Instead, comprehensive strategies that address both alcohol use and other social determinants of sexual health are necessary. Public health campaigns should emphasize the essence of consistent condom use, regardless of alcohol consumption, and consider the broader context of MSM's sexual health decisions. Educational initiatives and peer-led intervention approaches may help to increase condom use and reduce the risks associated with alcohol consumption. Furthermore, future research could investigate other factors that might

mediate or moderate the link between alcohol consumption and consistent use of condoms. Qualitative studies could provide deeper insights into the motivations, attitudes, and contextual factors that affect condom usage among MSM living in Ghana. Understanding the specific barriers to condom use, such as stigma, partner dynamics, and alcohol-related decision-making, will be critical for developing more effective interventions. The strong association between higher educational attainment and increased condom use, particularly with non-regular partners, underscores the need to incorporate educational outreach and literacy components into sexual health programs. Moreover, the significantly higher condom use among peer educators highlights the value of peer-led interventions in promoting safer sexual practices. Tailoring interventions to address regional disparities and leveraging religious and occupational networks could further enhance the effectiveness of behavior change efforts. These findings should inform the design of context-specific, culturally sensitive public health strategies to promote consistent condom use and reduce HIV transmission among MSM in Ghana.

In summary, the study provides valuable insights into the various interplays of factors affecting condom use behaviors among MSM. While alcohol use did not demonstrate an association with consistent condom use, other demographic, socio-cultural, and contextual factors were found to play crucial roles. These findings underscore the necessity of adopting multifaceted approaches in prevention programs, designed to address the diverse challenges and circumstances of this population. Further investigation should be done to explore the nuanced relationships between these factors to prompt the development of culturally appropriate interventions.

5.1 Limitation of the study

The research had some limitations. First of all, the sample may under - represent the broader MSM population in Ghana, as individuals not actively engaged with the gay community were excluded. Secondly, s, particularly concerning sensitive topics like alcohol consumption and risky behavior. There may also be underreporting as alcohol use is often stigmatized and under-disclosed. Moreover, to mitigate recall bias, questions were restricted to experiences within the past six months. In addition, a cross-sectional design restricts the ability to find causal relationships between alcohol use and consistent condom use. Longitudinal studies would be ideal to investigate the causal connections between the use of alcohol and condom use consistency among MSM in Ghana.

CHAPTER SIX

CONCLUSION AND RECOMMENDATIONS

6.0 Introduction

This area talks about the conclusions of the research, along with practical recommendations. It outlines the strengths and limitations of the study and suggests areas for future investigation.

6.1 Conclusion

In conclusion, the analysis found no significant association between alcohol use and consistent condom use among MSM in Ghana, across different partner types. The study also found that educational level, religious belief, occupation, and geographical region were significantly associated with consistent condom use among regular, non-regular, and paying partners. Based on the study's findings, it is evident that educational level, religious belief, occupation, and geographical region play a significant role in shaping consistent condom use among MSM across all partner types—regular, non-regular, and paying partners. These socio-demographic factors highlight the need for targeted interventions that are sensitive to the contextual realities of different subgroups within the MSM population. For instance, improving access to education and integrating sexual health content into both formal and informal educational platforms, such as the use of social media applications, may enhance consistent condom use. Additionally, engaging religious and community leaders, considering occupational dynamics, and addressing regional disparities in access to sexual health resources can strengthen the effectiveness of public health strategies aimed at reducing HIV transmission. These findings emphasize the importance of multi-faceted, context-specific approaches in promoting safer sexual behaviors.

The results highlight the complexity of sexual health behaviors in this population and imply that factors beyond alcohol consumption may play a more substantial part in determining condom use

patterns. Public health efforts should focus on multifaceted approaches that consider the unique challenges. Public health campaigns focusing on HIV prevention and safe sex practices should emphasize the importance of condoms, regardless of alcohol consumption(UNAIDS, 2021).

Given that alcohol may be influencing risky behaviors for certain individuals or situations, it may be important to incorporate strategies that address alcohol use in conjunction with other factors that affect sexual decision-making, such as stigma and access to healthcare.

In summary, the study provides valuable insights into the correlation between the use of alcohol and the consistent use of condoms among MSM. The findings have indicated that alcohol consumption is not associated with condom use in this population, which indicates that other factors, such as economic factors, relationship dynamics, and access to health resources, may have a more critical influence in shaping sexual health behaviors. Future interventions should continue to address condom use as a priority in HIV prevention programs, but also consider the broader array of influences on sexual health behaviors.

6.2 Recommendations

The results of this study point to several areas where further research could provide more comprehensive insights into the association between alcohol and the use of condoms among MSM in Ghana. Future studies could explore the role of other psychosocial factors, behavioral factors such as self-efficacy, peer influence, other social and demographical factors, stigma, education, availability of condoms, and relationship dynamics, which may interact with alcohol use to influence condom use.

Additionally, qualitative research could help understand the experiences of MSM in Ghana regarding alcohol consumption, sexual behaviors, and condom use. It would also be beneficial to

conduct longitudinal studies to assess how alcohol use over time might impact changes in sexual behaviors, as well as to investigate how alcohol use interacts with other risk factors for HIV transmission. Given that MSM in Ghana may face unique challenges, future research should aim to contextualize findings within the broader socio-political landscape of Ghana, considering factors such as the criminalization of same-sex sexual behaviors, discrimination, and access to sexual health services (Atuguba, 2019).

Stakeholders such as the Ghana AIDS Commission, Civil Society Organizations, Ghana Health Service, public and private universities, UNAIDS, Global Fund, and PEPFAR can help to implement a holistic intervention to address this gap. Specifically, these stakeholders could collaborate to design and deliver MSM-centered health education campaigns, integrate MSM-friendly services into existing health infrastructure, train healthcare workers on stigma-free service delivery, and create safe spaces where MSM can access condoms, alcohol harm-reduction counseling, and comprehensive sexual health services. Establishing monitoring and evaluation systems to track the impact of these interventions would further enhance their effectiveness and sustainability within Ghana's public health framework.

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