PERCEPTIONS OF PERSONAL RISK OF HIV INFECTION AMONG FEMALE PRISONERS IN GHANA

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DECLARATION

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I, the undersigned, declare that this dissertation is the result of my independent and original investigation in accordance with the rules of good academic practice, and that it has not been submitted in substance for any other degree nor is it concurrently being submitted in candidature or achievement of any other degree at any other university. I further declare that I have not previously made attempts to do a doctorate at any national or international university.

Reference to, quotation from and discussions of the work of all other authors have been appropriately acknowledged and cited within the dissertation. I fully take responsibility for all errors and omissions identified in this dissertation.

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Sheila Atogiba

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DEDICATION

To the glory of God, I gladly dedicate this dissertation to my children, Marcel Nana Kwame Anim and Mitchell Kwadwo Boahene Anim, who were both born during the pursuit of this doctoral study. For bearing with me in love.

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LIST OF ABBREVIATIONS AND ACRONYMS

AIDS	Acquired Immunodeficiency Syndrome
ARRM	AIDS Risk Reduction Model
ART	Antiretroviral Therapy
BBV	Blood Borne Viruses
CDC	Center for Disease Control and Prevention
CI	Confidence Interval
EALPR	Elevated Actual but Low Perceived Risk
e.g.	exempli gratia
et al.	et alia
etc.	et cetera
FHI	Family Health International
FSW	Female Sex Workers
GAC	Ghana AIDS Commission
GDHS	Ghana Demographic and Health Survey
GHS	Ghana Health Service
GPS	Ghana Prisons Service
GSS	Ghana Statistical Service
HAART	Highly Active Antiretroviral Treatment
HBV	Hepatitis B Virus
HBM	Health Belief Model
HCV	Hepatitis C Virus
HIV	Human Immunodeficiency Virus
HTC	HIV Testing and Counselling
ICPS	International Center for Prison Studies
IDU(s)	Injecting Drug User(s)
IEC	Information, Education and Communication
KABP	Knowledge, Attitudes, Behaviours, Practices
KP(s)	Key Population(s)
KPAR	Key Population at Risk of HIV
MATOD	Medication Assisted Treatment for Opioid Dependence
MENA	Middle East and North Africa
MOE	Ministry of Education
MOH	Ministry of Health
MOJ	Ministry of Justice
MSM	Men having sex with men
MTCT	Mother to Child Transmission
NAP	National AIDS Programme
NGO(s)	Non-Governmental Organisation (s)

NSP	Needle and Syringe Programme
NTP	National TB Programme
NYSDOH	New York State Department of Health
PEP	Post Exposition Prophylaxis
PI	Principal Investigator
PLHIV	People Living With HIV
PMTCT	Prevention of Mother to Child Transmission
PWID	People Who Inject Drugs
SCM	Stages of Change Model
STI	Sexually Transmitted Infection
SW(s)	Sex Worker(s)
TB	Tuberculosis
TRA	Theory of Reasoned Action
TTM	Transtheoretical Model
UNAIDS	Joint Programme of the United Nations on HIV/AIDS
UNFPA	United Nations Population Fund
UNODC	United Nations Office on Drugs and Crime
USAID	United States Agency for International Development
UNGASS	United Nations General Assembly Special Session on AIDS
USDJBJS	United States Department of Justice, Bureau of Justice Statistics
USDJNIJ	United States Department of Justice, National Institute of Justice
VIF	Variance Inflation Factor
VCT	Voluntary Counselling and Testing
WHO	World Health Organisation
WP-DI	Within Prison Drug Injection
WSW	Women having Sex with Women

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ABSTRACT

Background to the study

Prison populations are considered by many to be at greater risk of HIV infection than the general population. It is also apparent that high-risk HIV transmission behaviours may occur in prisons. Generally, women constitute a small proportion of the overall prison population as women and girls make up 6.9% of the global and 3.4% of the African prison populations. Furthermore, the HIV and AIDS epidemic in prisons across the world presents a major challenge. However, when it comes to tackling it, prisoners, especially females, are often neglected and overlooked. The success of efforts to achieve an AIDS-free generation will include reaching out to limit spread in prisons and among prisoners.

Objectives of the study

The general objective of this study was to examine the personal HIV risk perception among female prisoners in Ghana. This was achieved by examining the accuracy of personal HIV risk perception and their correlates among female prisoners in Ghana; the level of comprehensive knowledge of HIV/AIDS prevention and transmission; the influence of HIV-risky behaviour on personal HIV risk perception; the coping strategies used/adopted by female prisoners to reduce their risk of contracting HIV infection in prison; and the available HIV-related services in female prisons in Ghana.

Theoretical framework

The study was guided by the AIDS Risk Reduction Model (ARRM). The ARRM model posits behaviour change to be a process in which individuals move from one step to the next as a result of a given stimulus. The ARRM hypothesises that behaviour change is a process occurring in three stages: labeling one's behaviour as problematic, making a commitment to change behaviour and taking action to accomplish that change.

Methodology

The study was a census of female prisoners from all the female prisons in Ghana. It applied a quantitative research method which utilised data collected confidentially through a one-on-one survey using a standardised questionnaire. The questionnaire consisted of seven sections including

socio-demographic characteristics, prison environment, HIV risk related to blood contact, HIV risk related to injection drug use, HIV risk related to sexual contact/activity, HIV/AIDS knowledge, attitude and health and personal HIV risk perception. The data was processed and analysed using SPSS and STATA software version 13.0. The three major dependent variables that were used for analysis were comprehensive knowledge of HIV/AIDS transmission and prevention, HIV-risky behaviour in prison and personal HIV risk perception. Descriptive statistics were used to describe the basic features of the data. Bivariate and multivariable logistic regression analyses were conducted to establish associations. The level of significance was accepted at $p<0.05$ at 95% confidence interval.

Key findings

A majority (99%) of female prisoners participated in the study. The findings revealed that 73% had ever tested for HIV before this survey and 31% had tested positive for HIV. A low proportion (2%) did not know of their HIV results/status after the HIV test. Out of the 312 female prisoners who participated in this study, only 241 who were considered as potentially HIV negative were included/used for further analysis. In this subsample (241), the results revealed that 67% of female prisoners were between the ages of 20 and 39 years and 41% had no formal education. A majority (54%) of the potentially HIV negative female prisoners perceived themselves to be at a high risk for HIV infection in prison. Tattooing/body piercing, injection drug use, sharing of sharp instruments and sexual risk behaviour were the common HIV-related risk behaviours in female prisons. The level of comprehensive knowledge of HIV/AIDS transmission and prevention among the potentially HIV negative female prisoners was low (19.9%).

The findings revealed that 42.3% did not engage in HIV-risky behaviour in prison while more than half (57.7%) of the potentially HIV negative female population had engaged in, at least, one HIV-risky behaviour in prison. A major finding was that a female prisoner who had engaged in HIV-risky behaviour in prison was more likely to perceive herself of being at risk for HIV infection in prison (OR=2.81, $p<0.001$ 95% CI 1.57-5.01). A majority (65%) of the female prisoners reported that HIV services were offered in their prisons.

Discussion

Most of the female prisoners perceived themselves to be at a high risk for HIV infection in prison. Generally, this finding was consistent with studies conducted in other parts of the world. However, there were some substantial variations in terms of the study population. The level of overall knowledge of HIV/AIDS among the female prisoners was universal as all female prisoners had heard of HIV/AIDS. This contrasted with the fact that comprehensive knowledge of HIV/AIDS transmission and prevention among female prisoners in this study was low (19.9%) due to some HIV misconceptions. Internationally, similar findings were reported among prisoners where 20.5% had comprehensive knowledge of the routes of HIV transmission and preventive measures in Iran. Previous studies also reported that misconceptions of HIV transmission were high in Africa.

Female prisoners who had engaged in HIV-risky behaviour in prison were more likely to accurately appraise their HIV risk which was consistent with previous studies. Most female prisoners in Ghana reported that HIV-related services were offered in their respective female prisons even though provision of HIV testing and treatment was not adequately implemented within the prison-based health services. Similar findings were reported in other prisons in Sub-Saharan Africa.

Conclusion

This study was the first attempt of its kind to examine HIV-risky behaviour and HIV risk perception among only female prisoners in Ghana. The high HIV risk perception reported among female prisoners may have been overestimated due to information bias because most female prisoners who had not engaged in HIV-risky behaviour in prison had perceived a high HIV risk. However, female prisoners who engaged in HIV-risky behaviour in prison accurately appraised their HIV risk. These findings call for concerted efforts by stakeholders to implement strategies to improve accurate perceptions regarding HIV/AIDS and to eliminate risky behaviours among female prisoners that expose them to HIV infection.

CHAPTER ONE

INTRODUCTION

1.0. Background to the study

Globally, there are more than 10 million people who are incarcerated. This number has increased considerably to about a million in the past decade (Fazel & Baillargeon, 2011). Data available showed that there were more than 2.1 million prisoners in the United States of America, 1.65 million in China (plus unknown numbers in pre-trial detention and other forms of detention), 690,000 in Brazil, 583,000 in the Russian Federation, 420,000 in India, 364,000 in Thailand, 249,000 in Indonesia, 233,000 in Turkey, 230,000 in Iran, 204,000 in Mexico and 188,000 in the Philippines as of the end of September, 2018 (Walmsley, 2020a).

The International Centre for Prison Studies (ICPS) reported that there were about 9 million men, women and children (under 18 years of age) held in penal institutions around the world, with over 2 million (22%) in USA which had the highest prison population rate of 714 prisoners for every 100,000 persons as of 2007 (International Centre for Prison Studies (ICPS), 2008). Additionally, about 668,000 men and women were incarcerated in Sub-Saharan Africa with South Africa having the highest prison population in the region (Mushayabasa & Bhunu, 2011). For example, in USA, the ratio was 6:1; in France, it was 10:1; in Switzerland, it was 27:1 and in Mauritius, it was 50:1 as of 2003 (Macher and Goosby, 2004).

Walmsley (2020a) showed that more than 714,000 women and girls were held in penal institutions throughout the world, either as pre-trial detainees/remand prisoners or having been convicted and sentenced as of the end of September, 2018. It may be assumed that women have always constituted a very small proportion of the overall prison population worldwide as women and girls make up 6.9% and 3.4% of the global and African prison populations respectively (see United Nations Office on Drugs and Crime (UNODC), 2010; Walmsley, 2020a). Additionally, there are significant differences between continents, countries and regions in the proportions of female prison populations (Walmsley, 2020b). Walmsley (2020b) observed that the lowest levels were

found in Africa where the overall rate per 100,000 of the national population was 3.2% as of the end of September, 2017. In Asia, the rate was 6.2%, in Oceania (11.3%), in Europe (12.1% - 7.7% excluding Russia) and in the Americas (31.4% - 14.6% excluding USA) as of the end of September, 2017 (Walmsley, 2020b).

However, women's prison population is expected to be increasing, at least, in those countries where substance abuse is a major issue (United Nations Office on Drugs and Crime (UNODC), 2010). For instance, in the United States, there was an increase in the female prison population of about three times the increase in the general population (Walmsley, 2020b). Evidence available shows that the worldwide female prison population may still be increasing at a faster rate than the worldwide male prison population because the increase of about 50.2% for female prisoners and 18.1% for male prisoners in 2000 had reached about 53.3% and 19.6% respectively (Walmsley, 2020b).

The human immunodeficiency virus (HIV) is also infecting the prison population as available data showed that its prevalence among prisoners was between six and fifty times higher than that of the general adult population in 2003 (Macher & Goosby, 2004). Evidence showed that overall, female prisoners had higher HIV prevalence than male prisoners, although there were significant variations between regions (Dolan *et al*., 2016; Walmsley, 2020a; Avert, 2020). Statistics showed that in West and Central Africa, HIV prevalence among female prisoners was almost double that of male (13.1% vs. 7.1%) and in Eastern Europe and Central Asia, it was almost three times higher (22.1% vs. 8.5%) (Dolan *et al*., 2016; Walmsley, 2020a; Avert, 2020).

1.1. Problem statement

The challenge to preventing the spread of HIV infection among prisoners, especially female prisoners, is how they perceive themselves to be at risk of HIV/AIDS (Strathdee *et al*., 2015). Strathdee *et al*. (2015) confirm that female sex workers (FSWs) and female prisoners experience elevated HIV prevalence relative to the general population because of unprotected sex and unsafe drug use practices but the antecedents of these behaviours are often structural in nature. The prison

populations are considered by many to be at greater risk of HIV infection than the general population (see Jürgens, Nowak & Day, 2011). Jürgens *et al*. (2011) argue that the high prevalence of HIV infection among prisoners and pre-trial detainees combined with overcrowding and sub-standard living conditions, sometimes amounting to inhuman or degrading treatment in violation of international law, make prisons and other detention centres a high risk environment for the transmission of HIV. Thus, it is also apparent that high risk HIV transmission behaviours may occur inside prisons. Some researchers observe that incarcerated men and women differ in their views on HIV prevalence rates and susceptibility and their ability to prevent HIV infection (Titilayo *et al*., 2008).

Furthermore, the HIV and AIDS epidemic in prisons across the world presents a major challenge, however, when it comes to tackling it, prisoners are often neglected and overlooked (Avert, 2020). An Avert (2020) document indicates that prison grounds offer ideal conditions for the transmission of many infectious diseases including tuberculosis (TB), hepatitis (A, B and C), sexually transmitted diseases (STD's) and HIV. In addition, mental disorders and infectious diseases are more common in prisoners than in the general population (Fazel & Baillargeon, 2011).

Studies report that overcrowded and unsafe premises where injection drug use and unprotected sex are common make correctional facilities ideal breeding grounds for HIV infection as prisoners are not sealed off; they are often in close contact with the general population. This makes the prison population a significant vector of inward and outward transmission of HIV (United Nations Office on Drugs and Crime (UNODC), 2010; Avert, 2020).

It is argued that in the closed environment of prisons, women prisoners are, especially, vulnerable to sexual abuse including rape by both staff and other prisoners (United Nations Office on Drugs and Crime (UNODC), 2010). A study argued that while depressive complaints, irritability and risk of self-harm were all predicted by both importation and deprivation factors, the evidence suggested that deprivation factors had a greater impact on measures of well-being than importation factors, noting that the most important deprivation factors were treatment by staff and other inmates and environmental stress in prisons in the Netherlands (Slotboom, Kruttschnitt, Bijleveld, & Menting,

2011). This could be attributed to the fact that in many countries, women prisoners are held in small facilities immediately; adjacent to or located in male prisons.

In rare instances, women and young girls may not be separated from the male prison population at all (United Nations Office on Drugs and Crime (UNODC, 2010). Moreover, most prison systems are designed with male inmates in mind which explains why living conditions for women prisoners are often not tailored to their specific needs (Reyes, 2000; United Nations Office on Drugs and Crime (UNODC), 2010).

The challenge is also that in some countries, female prisoners may be supervised exclusively or mainly by male prison officers/staff (United Nations Office on Drugs and Crime (UNODC), 2010). Smith (2011) confirms that it is well known that sexual abuse occurs within the correctional system. Other studies throw more light on this issue by explaining that women in prison are also vulnerable to sexual exploitation and may trade or be forced to trade sex for food, goods or drugs with other prisoners or staff. They may engage in HIV-related risk behaviours (United Nations Office on Drugs and Crime (UNODC), 2010).

The idea is that with the HIV/AIDS epidemic confronting humanity, a new problem has arisen for women prisoners (Reyes, 2000). Reyes (2000) contends that HIV and AIDS have specific manifestations in women, therefore, the prison environment may considerably complicate proper administration of medical care and follow-up for women with HIV. Although failings in treatment and aftercare provision contribute to adverse outcomes, it appears that the contribution of prisons to illness is unknown (Fazel & Baillargeon, 2011). Fazel and Baillargeon (2011) highlighted that women prisoners aged 55 years and older and juveniles present higher rates of many disorders than other prisoners do. Moreover, female prisoners are much more likely to have a drug problem (than male prisoners) and a higher HIV prevalence yet are much less likely to have access to HIV prevention and treatment and access to drug treatment in prison (Strathdee *et al*., 2015).

Against this backdrop, it is recommended that an important component of HIV prevention is to encourage people to appreciate their personal risk of HIV infection and to educate them on how to

reduce their risk (Adebayo *et al*., 2010). A dimension that should not be ignored in this kind of education is that women who trade sex or are imprisoned and engage in substance use should not be considered in separate silos because sex workers have high rates of incarceration and many female prisoners have a history of sex work (Strathdee *et al*., 2015). This also brings to the fore the need to identify factors which may influence the personal risk perception of HIV infection among female prisoners.

The problem with the personal risk perception of HIV infection among female prisoners is caused by HIV risk related behaviours (Gilchrist, Blazquez, & Torrens, 2011). Gilchrist *et al*. (2011) found that female drug users reported greater psychopathology and risk behaviours than male drug users, putting them at greater risk for HIV. Studies have indicated that the heightened HIV prevalence could be attributed to risk-taking behaviours prior to incarceration such as higher frequencies of injection drug use (United States Department of Justice, Bureau of Justice Statistics (USDJBJS), 1948; United States Department of Justice, National Institute of Justice (USDJNIJ), 1995).

Other researchers have also reported that the problem is due to unprotected sexual intercourse with multiple and high risk partners, needle sharing and substance use during sex (Braithwaite, Hammett, & Mayberry, 1996; Titilayo *et al*., 2009). Again, it is indicated that inmates also engage in similar high risk activities during incarceration as well as sexual intercourse, use of drugs or alcohol and tattooing and body piercing using unsterilised instruments (Braithwaite *et al*., 1996; Titilayo *et al*., 2009).

Another issue with the problem of female prisoners contracting HIV infection is the inability of the prison system to ensure that male prisoners are separated from female prisoners, leading to HIV-related risk behaviours (Wise *et al*., 2017). This is why a study argued that women involved in the criminal justice system experience multiple risk factors that increase the likelihood of acquiring HIV infection (Wise *et al*., 2017). Wise *et al*. (2017) found that of 5,154 women, 11% were incarcerated within the previous year, 36% were ever incarcerated but not in the past 12 months and 53% were never incarcerated, indicating that prevalence of exchange sex, multiple

casual partners, multiple casual condomless partners and sexually transmitted infection diagnosis were all higher among recently incarcerated women compared with those never incarcerated.

Despite the challenges caused by lack of separate facilities for female prisoners, the United Nations Standard Minimum Rules acknowledge that separate provision of facilities for women can be disproportionately costly (Reyes, 2000; United Nations Office on Drugs and Crime (UNODC), 2010). Researchers have argued that whatever the reasons or arrangements found for separation of the sexes, the fundamental issue of addressing women's specific needs is often neglected (Reyes, 2000; United Nations Office on Drugs and Crime (UNODC), 2010). These researchers explain that basic requirements such as greater access to showers when women prisoners have their monthly periods or making sanitary napkins available are often simply not provided for.

For instance, not all women's prisons cater for prisoners who are pregnant although some of them do provide for mothers with newborn babies or infants (Reyes, 2000; United Nations Office on Drugs and Crime (UNODC), 2010). All these events make female prisoners vulnerable to HIV infection. This view is confirmed by a study which observed that recent incarceration was associated with several factors that increased the risk of HIV acquisition in the United States of America (Wise *et al*., 2017).

Female prisoners' exposure to HIV infection could be caused by the seeming lack of healthcare facilities in the prisons and infirmaries (see Adjei *et al*., 2006, 2008). Adjei and a team of researchers referred to anecdotal reports which showed that a great deal of unsafe sexual activities including sodomy, homosexual and lesbian activities, paid sex and sexual favors to prison officers, drug injection and needle sharing occurred among prisoners in Ghana (Adjei *et al*., 2006, 2008). However, recent evidence shows that there are inadequate medical facilities and staff in prisons in Ghana and access to appropriate care outside the Ghana prison system is very difficult for the inmates (Adjei *et al*., 2006, 2008). Adjei and colleagues reported that inmates and officers of correctional facilities in Ghana constitute a high risk group for HIV, HBV, HCV and syphilis infections and recommended counselling, routine screening and HBV vaccination and treatment (Adjei *et al*., 2006, 2008).

Despite the fact that women prisoners constitute a very small proportion of the prison population, it is also clear that they present specific challenges (e.g. lack of adequate knowledge of HIV infection) for correctional authorities (United Nations Office on Drugs and Crime (UNODC), 2010). Mutai (2011) found that associated risk factors for HIV infection included ignorance of transmission modes, ignorance of prevention modes, illiteracy and injection drug use. Thus, the inability of the correctional authorities to handle or provide education on hygiene has been assumed to be contributing to the high prevalence of HIV infection among prisoners, especially female prisoners (Kabwama & Berg-Beckhoff, 2015). Kabwama and Berg-Beckhoff (2015) examined the association between what people know about HIV/AIDS and how they perceived their risk of infection and concluded that the association between HIV/AIDS knowledge and risk perception might follow a continuum from positive to no association and finally to negative.

The problem related to individual female prisoners' lack of appreciation of their perception of HIV infection subsists on inadequate healthcare provision and individual (female prisoners in this case) behaviours that could expose them to acquiring HIV infection (Larsman, Eklöf & Törner, 2012). The seeming lack of healthcare provision in the prison system deprives the inmates access to behavioural change strategies that would minimise their exposure to HIV risk infections. Larsman *et al*. (2012) found that there was evidence, although inconsistent, for both a negative and positive association between risk perceptions and risk behaviour.

1.2. Justification / Public health relevance of the study

Although the high prevalence of blood-borne viral infections and syphilis in correctional facilities had been well documented globally, such data were sparse from Africa (Adjei *et al*., 2006, 2008). Additionally, while HIV in female prisons had been identified, this had yet to be fully explored for various reasons including the lack of statistics and the fact that female prisoners are generally marginalised, despised and politically helpless (Reyes, 2000; United Nations Office on Drugs and Crime (UNODC), 2010).

Despite the tremendous importance of HIV/AIDS in public health policy formulation, there was scarcity of published data on HIV/AIDS among female prisoners in Ghana (Adjei *et al*., 2006,

2008). Hence, this study was conducted to fill the gaps with regards to the situation of HIV infection among female prisoners in Ghana.

In spite of the reality that there are problems associated with female prisoners' perceptions about risk of HIV infection, there appears to be a considerable knowledge gap in understanding the magnitude of the HIV epidemic in prison communities and its multiplier effect on the non-prison population in Ghana in particular and the African sub-region in general (Mutai, 2011). Mutai (2011) notes that prisoners are a vulnerable group and require special attention when addressing the needs of populations most at risk in HIV programmes. Therefore, the need for collaboration between academic institutions and policy makers to develop policies that will contribute towards minimising HIV transmission and sustain the current low HIV prevalence within the prison has been recommended (Mutai, 2011).

It was seen that this recommendation was not adhered to in terms of conducting separate studies among female prisoners to provide evidence for policy development towards reducing HIV-related risk behaviours in Ghanaian prisons (Adjei *et al*., 2006, 2008). Thus, this research was aimed at filling the gaps in knowledge by identifying the possible areas that could be used as the basis to develop a suitable policy to address HIV infections among female prisoners.

Although a study reported that respondents perceived the risk of contracting HIV infection to be four times higher before prison than in prison (see Kabwama, & Berg-Beckhoff, 2015), there was the urgent need to examine the personal risk perception of HIV infection among prisoners, especially female prisoners, so as to gather evidence to be able to bridge the gap in the literature regarding the case of Ghana.

Studying HIV-related risk behaviours was necessary to be able to understand how female prisoners perceived their own perceptions of personal risk of HIV infection. This was important in filling the research gap since evidence showed that patterns of sexual behaviour of men and women prisoners, the nature of circumstances leading to high risk sexual activity in prison environments as well as the risk behaviours associated with the injection of drugs or tattooing were largely

unknown in Africa in general and Ghana in particular (United Nations Office on Drugs and Crime (UNODC), 2010).

Given that previous studies had reported the transmission of HIV and other infectious diseases in prisons (Adjei *et al*., 2006, 2008), assessing the HIV-related risk behaviours of female inmates would provide information about the characteristics of inmates who engaged in these behaviours and their prevention needs. Such information could be used to inform interventions that would reduce HIV transmission within the prison population as well as in the community upon release from prison.

The absence of recognised data on HIV-related risk behaviours among female prisoners compels organisations aiming to initiate HIV programmes in female prisons to improvise, often 'reinventing the wheel' (Fisher, Foreit, Laing, Stoeckel & Townsend, 2002). This study sought to provide important data on HIV-related risk behaviours among female prisoners in Ghana in the light of these unexamined issues. This would respond to the need for evidence-based intervention to aid in the development of prison policy, legislation and programmes aimed at reducing the risk of HIV transmissions and improving the health of female prisoners in Ghana and elsewhere.

Despite compelling evidences that women prisoners are susceptible to all types of infections including HIV, no study had yet been conducted to assess the HIV-related risk behaviours among only female prisoners in Ghana (Adjei *et al*., 2006, 2008). This study sought to help address this deficiency in literature.

It is important for female prisoners to be knowledgeable of HIV infection and its transmission so as to reduce their risk while in prison. Nonetheless, it was viewed that no study had examined the level of knowledge of HIV among female prisoners in Ghana (see Adjei *et al*., 2006, 2008). Even though some studies had been conducted among prisoners in Accra and Nsawam, these studies did not look at the comprehensive knowledge of HIV/AIDS transmission and prevention among female prisoners (Adjei *et al*., 2006, 2008).

This gap was a major impediment to scaling up HIV interventions for women who are incarcerated. It was expected that evidence from this study showing female prisoners' awareness or otherwise of comprehensive knowledge of HIV/AIDS transmission and prevention would help in designing appropriate interventions to target present and future HIV epidemic among female prisoners in Ghana and elsewhere.

The provision of evidence on the availability of HIV health facilities in relation to the healthcare needs of female prisoners would help in designing suitable healthcare facilities (Fisher *et al*., 2002). Such data based on evidence illuminating crucial healthcare risks among female prisoners could help health policymakers and other service providers to tailor services to address and lessen these risks (Fisher *et al*., 2002). This would help lessen the healthcare inconveniences faced by women prisoners. However, literature on this was lacking. Therefore, the aim of this study was to identify the challenges associated with the provision of appropriate healthcare facilities for female prisoners due to their peculiar HIV infection needs in Ghana in particular and Africa in general.

1.3. Review of related studies/literature on HIV/AIDS

1.3.1. Introduction

This section presents the review of related literature on the key concepts supporting this research. The chapter is presented in sections. Section one presents Human Immunodeficiency Virus (HIV) and Acquired Immune Deficiency Syndrome (AIDS). Section two presents epidemiology and dynamics of HIV/AIDS. Section three presents HIV/AIDS and prisoners. Section four presents level of knowledge of HIV. Section five presents HIV risk perceptions. Section six presents HIV-related risk behaviours. Section seven presents female prisoners and the availability of HIV-related health facilities.

1.3.2. Human Immunodeficiency Virus (HIV) and Acquired Immune Deficiency Syndrome (AIDS)

A document describes that Human Immunodeficiency Virus (HIV) is the virus that causes Acquired Immune Deficiency Syndrome (AIDS) and that Human Immunodeficiency Virus (HIV) infection can cause a broad spectrum of clinical manifestations, ranging from an asymptomatic carrier state to severe immunodeficiency (Kamga *et al*., 2011). What happens is that HIV destroys the biological ability of the human body to fight off opportunistic infections such as pneumonia and tuberculosis (TB); and a person can be infected with HIV for a long time without showing any symptoms of the disease (Simon, Ho & Abdool Karim, 2006). Nonetheless, during that period before a person develops symptoms, he or she can transmit the infection through sexual contact to other people (Simon *et al*., 2006).

A World Health Organisation document notes that an infected woman can also transmit the disease to her infant during pregnancy or delivery or while breastfeeding; and HIV can also be spread by transfusions of contaminated blood and by sharing needles used for injections and drug use (World Health Organisation (WHO), 2005).

A report indicates that AIDS is defined in terms of how much deterioration of the immune system has taken place as seen by the presence of opportunistic infections (Simon *et al*., 2006; Zhang *et al*., 2017). Simon *et al*. (2006) observe that virtually all infected persons die from the disease as AIDS stands for Acquired Immune Deficiency Syndrome. These researchers note that AIDS is a disease caused by Human Immunodeficiency Virus or HIV and acts by weakening the immune system, making the body susceptible to and unable to recover from other diseases.

It has been explained that Human Immunodeficiency Virus (HIV) transmission risk is primarily dependent on behaviour (sexual and injection drug use) and HIV viral load (Skarbinski *et al*., 2015). Skarbinski *et al*. (2015) show evidence that more than 25 million people have died of Acquired Immune Deficiency Syndrome (AIDS) since 1981 and as of 2009, UNAIDS estimated that 33.4 million were living with Human Immunodeficiency Virus type-1 (HIV-1) infection and

2 million were newly diagnosed with HIV-1 each year. Sub-Saharan Africa continues to bear the major burden with 22 million HIV infected persons.

1.3.3. Epidemiology and dynamics of HIV/AIDS

This section presents the epidemiological basis and the dynamics of HIV/AIDS, looking at the statistics from the global, Sub-Saharan Africa and Ghanaian contexts.

1.3.4. Global HIV/AIDS epidemiology and surveillance

A study observes that the HIV pandemic is a public health crisis since there is currently no region in the world untouched by HIV (Simon *et al*., 2006). For instance, globally, about 36.9 million people were living with HIV infection, including 35.1 million adults and 1.8 million children younger than 15 years of age as of the end of 2017 (UNAIDS, 2018). Additionally, a Center for Disease Control and Prevention (CDC) report showed that about 1,140,400 persons who were 13 years of age and older were living with HIV infection in the United States, including 977,900 persons with diagnosed HIV and 162,500 whose infection had not yet been diagnosed (undiagnosed HIV) with about 77% being males as of the end of 2016 (Linley *et al*., 2019). Some researchers revealed that all countries in North America, Western Europe and Oceania have had stable or increasing numbers of People Living with HIV (PLHIV) from 2006 to 2011 (UNAIDS, 2013; Fettig, Swaminathan, Murrill & Kaplan, 2014).

The global statistics continue to show that about 42% of women were infected with HIV with more than 70% of HIV infected women living in Sub-Saharan Africa (UNAIDS, 2006; Simon *et al*., 2006). Other researchers note that females constitute about 60% of People Living with HIV (PLHIV) in Latin America and the Caribbean than in any other region of the world (Platt *et al*., 2016). Generally, there has been an increasing burden of HIV infections in women and this has additional implications for Mother-to-Child Transmission (MTCT) (Quinn & Overbaugh, 2005; Simon *et al*., 2006). Other researchers are also of the view that most countries have many HIV infected men with approximately 2.5 men infected with HIV for every woman infected with HIV

and Germany had the highest disparity with 5.6 HIV infected men for every 1.0 infected woman (Sullivan, Jones, & Baral, 2014; Fettig *et al*., 2014).

Data showed that the HIV pandemic had shifted over the past 30 years from the first reported cases in the early 1980s to an estimated high of 3.7 million new infections in 1997. New infections and AIDS-related mortality declined throughout the 2000s (UNAIDS, 2013; Fettig *et al*., 2014). Evidence showed that globally, there were fewer HIV-related deaths in 2015 than at any point in almost two decades and fewer people became newly infected with HIV than in any year since 1991 (World Health Organisation (WHO), 2016). Additionally, global statistics showed that there were about 940,000 AIDS-related deaths in 2017, representing a 34% decline from 2010 rate (UNAIDS, 2018).

There are different modes of transmission including the fact that heterosexual transmission is still the main mode of HIV transmission and accounts for about 85% of all HIV infections (Simon *et al*., 2006). It should also be noted that the epidemiologic methods for HIV surveillance are different in the high-income countries of North America, Western Europe and Oceania as compared to other regions of the world (Sullivan *et al*., 2014). This gives the idea that less-resourced countries usually use health survey or sentinel surveillance data to estimate HIV prevalence, incidence and mortality while high-income countries have case-based surveillance systems to describe HIV epidemiology (Sullivan *et al*., 2014; Fettig *et al*., 2014).

A combination of HIV and other related diseases have been assumed to cause deaths in people with HIV/AIDS (Del Rio, 2017). Del Rio (2017) notes that tuberculosis is still the most common cause of death in persons with HIV infection, accounting for about one-third of all global AIDS-related deaths. The recent decline in the numbers of infected people could be attributed to the proliferation of drugs that could suppress the CD4 count (Simon *et al*., 2006). For instance, some researchers report that there were about 9.7 million people in low and middle-income countries on antiretroviral drugs (ART) in 2012 (Fettig *et al*., 2014). Globally, the decline in AIDS-related deaths has been attributed to the expanded availability and use of antiretroviral therapy in many

regions of the world (UNAIDS, 2018). For instance, about 21.7 million persons living with HIV infection globally were taking antiretroviral in 2017 (UNAIDS, 2018).

Fettig and colleagues argue that even though PLHIV are living longer, the incidence of new infections continues to decline — an estimated 2.3 million new HIV infections occurred in 2012 which was a 34% decrease from 2000 rate (Fettig *et al*., 2014). It was reported that the greatest decrease in HIV incidence was among children and this had been reduced by 52% in 10 years (Fettig *et al*., 2014). Other evidence available indicated that a unique feature of the HIV epidemic in Western Europe was that about 35% of AIDS cases (which were reported through 2006) were among migrants, with majority from Sub-Saharan Africa (Del Amo *et al*., 2011; Fettig *et al*., 2014).

1.3.5. Sub-Saharan Africa HIV/AIDS epidemiology and surveillance

The evidence available indicates that HIV prevalence and incidence estimates in many developing countries, including countries in Sub-Saharan Africa, are calculated using statistical models based on either sentinel surveys among pregnant women or household surveys (UNAIDS, 2013; Fettig *et al*., 2014). A UNAIDS report reveals that Sub-Saharan Africa (SSA) has been the hardest hit region of the world with the HIV pandemic based on the analysis that HIV prevalence increased from 23.5 million in 2010 to 25.5 million in 2015 and then stabilised at 25.7 million in 2017 (UNAIDS, 2016). Additionally, recent evidence showed that the HIV prevalence rates were highest in Sub-Saharan Africa with 6.8% in Eastern and Southern Africa and 1.9% in Western and Central Africa (UNAIDS, 2018).

Therefore, some analysts contend that Southern Africa has been the epicenter of HIV and continues to have high rates of new HIV infections (Hayes & Weiss, 2006; Simon *et al*., 2006). Nonetheless, other researchers also argue that the overall trends in HIV epidemiology in Sub-Saharan Africa showed less new infections and reduced AIDS-related mortality (UNAIDS, 2013; Fettig *et al*., 2014). Furthermore, there was a 25% decline (from 1.6 million to 1.2 million) in HIV new infections from 2012 to 2017. Sub-Saharan Africa led the way (UNAIDS, 2018). A World Health

Organisation (WHO, 2011) report suggested that access to ART had reduced mortality rates and contributed to reduced HIV infection rates in most countries.

A global indication was that about 50% of PLHIV constituted women and 59% of this proportion was in Sub-Saharan Africa (UNAIDS, 2013; Fettig *et al*., 2014). Some researchers confirmed this assertion by noting that the prevalence and incidence of HIV infection had been consistently higher among women than men in Sub-Saharan Africa (Psaros, Remmert, Bangsberg, Safren & Smit, 2015; Mutabazi, Zarowsky & Trottier, 2017). This was because of the reality that women are more likely to be infected with HIV as compared to their male counterparts (Ramjee & Daniels, 2013). Ramjee and Daniels (2013) argue that the main mode of HIV transmission in Sub-Saharan Africa has been through unprotected heterosexual intercourse.

A different perspective to the mode of transmission in Sub-Saharan Africa was suggested to be injection drug use (IDU) which is increasingly contributing to the HIV epidemic across Sub-Saharan Africa even though data on injection drug users is limited (Asher, Hahn, Couture, Maher & Page, 2013). For instance, injection drug use has been observed to be a significant mode of transmission in the Middle East and North Africa (MENA) where heroin is produced, supplied and trafficked (Mumtaz *et al*., 2014).

It has been indicated that majority of women in Sub-Saharan Africa are diagnosed during pregnancy or at delivery through antenatal and perinatal care (Psaros *et al*., 2015; Mutabazi *et al*., 2017). It is against this backdrop that efforts have been made to increase global antiretroviral therapy (ART) coverage for the Prevention of Mother-to-Child Transmission (PMTCT) with almost universal coverage in some high-income countries (see World Health Organisation (WHO), 2010). The Mother-to-Child Transmission (MTCT) of HIV refers to the transmission of HIV from an HIV positive woman to her baby or child either during pregnancy, childbirth (labor, delivery) or breastfeeding (Mutabazi *et al*., 2017).

Nonetheless, it was shown that only 53% of pregnant women and 35% of infants in Sub-Saharan Africa who were in need of ARVs were able to receive the treatment in 2009 (WHO, 2010;

Gourlay, Birdthistle, Mburu, Iorpenda & Wringe, 2013). Perhaps, it is about time that much attention was refocused on MTCT because it is the most common way of transmission of HIV to children (Mutabazi *et al*., 2017). Mutabazi *et al*. (2017) provided one of the possible justifications to be that of a positive impact of PMTCT on mothers and children in Sub-Saharan Africa. This claim has been confirmed in a recent document that MTCT accounts for most HIV infections in children between 0 to 14 years of age (Avert, 2020).

1.3.6. Ghana's HIV epidemiology and surveillance

Historically, the first AIDS case in Ghana was reported in March 1986 which sharply increased to 26 by the end of 1986 (Amofah, 1992). Amofah (1992) showed that since the first case in 1986, about 90,000 AIDS cases had been reported by December 2004 in Ghana. Currently, quite a lot is known about HIV and Ghana's response to it as far as awareness is concerned is near universal (Laar & DeBruin, 2017). Epidemiologically, Ghana is classified as having a generalised HIV epidemic (Baum, Gollust, Goold & Jacobson, 2007; Laar & DeBruin, 2017). A nationally representative population-based survey found that HIV prevalence in Ghana was 2.0% in 2014, having decreased marginally from a high 3.2% in 2006 (Ghana Statistical Service (GSS), 2015; Laar & DeBruin, 2017).

However, the 2016 HIV Sentinel Survey reported a national HIV prevalence of 2.4%, a second consecutive increase from 1.6% in 2014 and 1.8% in 2015 (Ghana AIDS Commission (GAC), 2017; Laar & DeBruin, 2017). Statistics showed that HIV prevalence in the general population in Ghana was 1.6% with the following regional variation — highest prevalence in Eastern (2.8%), Western (2.7%) and Greater Accra (2.5%) regions; and lowest in the three northern regions: Northern, Upper East and Upper West (<1%) (Ghana Statistical Service (GSS), 2015; Ali *et al*., 2019).

Some researchers argued that among women and girls selling sex, the prevalence was 12.9% compared to 2.1% among pregnant women and 2.2% in the general female population (Ghana AIDS Commission (GAC), 2012; Family Health International (FHI) 360, 2012; Onyango *et al*.,

2012). Nonetheless, there had been a reduction in new HIV infections by 57% and AIDS-related deaths by 33% between 2000 and 2015 while HIV testing among women had doubled since 2008 (Ali *et al*., 2019). Ali *et al*. (2019) showed that Ghana has a low-level HIV epidemic with disproportionately high prevalence of HIV in key populations (KPs) such as female sex workers (FSW) and men who have sex with men (MSM). Confirming this, local estimates demonstrated that the prevalence of HIV among key populations in Ghana was over ten-fold higher than in the general population in Ghana (Ministry of Health (MOH), 2011; Laar & DeBruin, 2017).

Kass (2005) explains that key populations include men who have sex with men (MSM), persons who inject drugs (PWID), transgender persons, prisoners and sex workers (SWs) because they are key to the HIV epidemic's dynamics and its response (Kass, 2005; Laar & DeBruin, 2017). In Ghana, these key populations/groups are considered to be deviants in the Ghanaian culture. These groups are at the receiving end of restrictive and arguably rights-restricting penal codes (Williamson, Wondergem & Amenyah, 2014; Laar & DeBruin, 2017).

Ghana is striving towards achieving the goal of the United Nations Programme on HIV/AIDS' 90-90-90 agenda which targets/aims at achieving 90% of HIV positive people knowing their status, 90% of those diagnosed being on treatment and 90% of those on treatment being virally suppressed like many other countries (UNAIDS, 2014; Ali *et al*., 2019). In September 2016, the Government of Ghana adopted the World Health Organisation's (WHO) policy on "treat all" which is the provision of antiretroviral treatment (ART) to all people living with HIV (PLHIV) irrespective of their CD4 count. This was previously used as a cut off to start treatment (WHO, 2015; Ali *et al*., 2015).

In line with its half century old penal code, Ghana criminalises and penalises behaviours of some key populations — those deemed to be at higher risk of acquiring or transmitting Human Immunodeficiency Virus (HIV) (Appiahene-Gyamfi, 2009). Appiahene-Gyamfi (2009) explains that men who have sex with men (MSM) and sex workers (SWs) fit into this categorisation. For instance, same sex relationships, solicitation for sex and sex work are criminalised and penalised in Ghana (Republic of Ghana, 1960; Laar & DeBruin, 2017).

A report showed that the key populations (KPs) were disproportionately affected by HIV in Ghana as there were about 65,000 female sex workers (FSWs) and about 55,000 men who sleep with men (MSM) in the country (Ghana AIDS Commission (GAC), 2016; Ali *et al*., 2019). Statistics showed that prevalence of HIV was 6.9% in FSWs in 2015 and 18.1% in MSM in 2017. FSW and their clients and MSM accounted for 28% of all new infections in the country (Ghana AIDS Commission (GAC), 2016; Ali *et al*., 2019). Laar and DeBruin (2017) noted that despite restrictive laws, key populations in Ghana continue to receive HIV testing without serious hindrances.

In spite of the above, the argument is put across that the Ghana Demographic and Health Survey (which is one of the main sources of data on HIV in Ghana) does not include data on key populations (KPs) and there was no data on the number of HIV positive KPs linked to care and treatment (Ghana Statistical Service (GSS), 2015; Laar & DeBruin, 2017). The latest modes of transmission study (MoT) showed that majority of new HIV infections (72.3%) was occurring among the general population but regular partners of FSWs together accounted for nearly one-quarter (23.0%) of new HIV infections in Ghana (Ghana AIDS Commission (GAC), 2014).

In Ghana, the two transmission channels which accounted for most of the new HIV infections were through heterosexual contact and mother-to-child (MTC) transmission (Ministry of Health (MOH), 2001). It has been observed that besides sexual contact and MTC transfer, HIV can also be transmitted through contaminated blood, for example, through transfusions or the sharing of needles or blades that have been in contact with the blood of an HIV-infected person. This debunks the misconception that HIV is transmitted by mosquitoes or casual contact such as shaking hands or kissing or by sharing bowls or utensils (Ghana Statistical Service (GSS), 2015). Since HIV/AIDS knows no bounds, it could affect any population group, prisoners inclusive (see Spaulding *et al*., 2011; World Health Organisation (WHO), 2014) as described below.

1.4. HIV/AIDS and prisoners

This section focuses on HIV/AIDS among prisoners. Dolan (1997) explained that HIV transmission in prison is difficult to document due to uncertainties regarding precise date of infection, the rapid turnover of inmates, low levels of HIV testing and inmates' reluctance to report risk behaviours to prison authorities (Dolan, 1997; Dolan *et al*., 2015). Nevertheless, there are reports of HIV transmission in prisons (Horsburgh, Jarvis, MacArthur & Ignacio, 1990; Mutter, Grimes & Labarthe, 1994; Dolan *et al*., 2015). Based on this argument, it was necessary to examine HIV/AIDS infection among prisoners as documented in literature so as to put this study into perspective.

Das and Horton (2016) argue that people who are incarcerated are the most neglected and vulnerable of all populations in the global HIV/AIDS response. Therefore, it is not surprising that the prison populations are at a higher risk of HIV infection because of risk factors that are at play both before incarceration and in prison where there are frequent opportunities for further transmission (Das & Horton, 2016).

Wirtz and colleagues report that prisons and other closed facilities such as jails, compulsory drug detention centres and other detention settings present opportunities for the transmission and acquisition of Human Immunodeficiency Virus (HIV) and viral hepatitis during detention and after their release (Wirtz, Yeh, Flath, Beyrer & Dolan, 2018).

There are different means by which HIV can be transmitted in a prison setting (Zamani *et al*., 2010; Dolan *et al*., 2015, 2016). One point of view is that it can be transmitted in prisons through sexual activities, rape, unsafe medical practices, tattooing, blood sharing rituals, sharing of injection equipment and other sharp instruments and from mother to child if the needed interventions are not put in place (United Nations Office on Drugs and Crime (UNODC), 2010).

In addition, prisons are a high-risk environment for HIV transmission since drug use and needle sharing, tattooing with homemade and unsterilised equipment, high-risk sex and rape are commonplace for these HIV-related risk behaviours (Dolan *et al*., 2016; Avert, 2020). Wirtz *et al*.

(2018) support this by arguing that prisons lack adequate space, drinking water, good nutrition, natural light and fresh air. There is also poor sanitation. Thus, most of these factors increase both the chances of being infected with HIV and TB in a prison setting (UNODC, 2010; Wirtz *et al.*, 2018).

Some researchers argued that HIV/AIDS had reached alarming proportions in correctional facilities worldwide and continues to ravage the lives of inmates in these centres (Ncoyo, 2012; Doyal, 2013). A systematic review estimated that 389,000 (3.8%) people in prisons were living with HIV, 1.55 million were living with HCV (15.1%), 492,500 with chronic HBV infection (4.8%) and 286,000 with active tuberculosis (2.8%) (Dolan *et al*., 2016; UNAIDS, 2017). As prisoners are part of the broader community, the health threat of HIV within prisons is inseparably associated with the outside world since they can infect people on their release, hence, there is the need for coordinated action (UNODC, 2010). Against this background, a study argues that any intervention programme against HIV/AIDS in prison must involve not only the prisoners but the prison officials and the entire community from which they come (Akeke, Mokgatle & Oguntibeju, 2007).

Some studies recommended the need for support of the government, non-governmental organisations (NGOs) and all other stakeholders in the campaign against HIV/AIDS in the prison and community (Akeke *et al.*, 2007; Avert, 2020). This is relevant because evidence available shows that in many cases, incarcerated women are low-income earners and have limited education and sporadic employment histories (Akeke *et al*., 2007; Western, Braga, Davis & Sirois, 2015). In comparison with men, women are less likely to be incarcerated for a violent crime and more likely to be incarcerated for a drug or property offence (Freiburger, 2011). Similarly, research has highlighted that female prisoners aged 55 years and older and juveniles have higher rates of many disorders than do other prisoners (Fazel & Baillargeon, 2011).

1.4.1. Level of HIV/AIDS knowledge among prisoners

This section presents analysis of literature that focused on knowledge of HIV among the prison population. The World Health Organisation (WHO) advocates for an important role for education in spreading knowledge of HIV/AIDS transmission (World Health Organisation (WHO), 2012). This is because some researchers argue that knowledge and attitude studies are generally used in designing health promotion and health education programme interventions to impact knowledge, alter attitudes and behaviour that are risky to health (Hadlaczky, Hökby, Mkrtchian, Carli & Wasserman, 2014). To this end, other researchers suggested that understanding the dynamics of HIV infection within a country, how it changes over time and who is currently at greatest risk were essential for guiding decisions about effective prevention programmes (Majdi *et al*., 2011; Case *et al*., 2012).

Consequently, Jürgens and colleagues also proposed that prisons and prison inmates were important targets for HIV/AIDS prevention interventions as inmates often have a history of high risk behaviour that place them at risk of contracting HIV/AIDS; and rates of HIV/AIDS tend to be much higher in this population (Jürgens, Nowak & Day, 2011). Majdi *et al*. (2011) found that prisoners in Mazandaran province in Iran demonstrated average to good knowledge of HIV/AIDS. Even with this, these analysts contended that misconceptions were present as the respondents showed limited knowledge of how HIV and AIDS could be transmitted.

However, Saliu and Akintunde (2014) found that knowledge of HIV was high (94.6%). Nonetheless, these researchers observed that there were still misconceptions as 68.9% of respondents believed that people with the disease should be avoided while 70% also believed that AIDS could be cured. The researchers noted that even though knowledge of HIV/AIDS among inmates was high, misconceptions were still rife among prison inmates in Ogbomoso Prison in Oyo State, Nigeria (Saliu & Akintunde, 2014).

Adjei *et al*. (2006) argued that knowledge of the prevalence and distribution of blood-borne viruses and sexually transmitted diseases (STDs) in different parts of the world, and particularly in Africa, are important for the planning of preventive measures and the development of vaccination programmes. These analysts explained further that the comparison of the blood-borne viruses and prevalence of STDs among prisoners, prison officers and the general population in the same geographical area was important in providing a basis for action and the needed changes in public health policy, education and clinical practice (Adjei *et al*., 2006, 2008).

1.4.2. HIV-risk perception

This section presents evidence of studies that examined HIV risk perception among prisoners. Adebayo and colleagues explained that a major component of HIV prevention is to encourage individuals to appreciate their personal risk of contracting the virus with the aim of encouraging them to take steps to reduce the risks (Adebayo, Anyanti, Ankomah, Omoregie & Mamman-Daura, 2010). Another perspective is that the behaviours that lead to incarceration could also put women at increased risk of HIV infection (Paxton, Williams, Bolden, Guzman & Harawa, 2013). The evidence showed that these risk factors were present in abundance among female inmates (Gilchrist, Blazquez & Torrens, 2011).

To resolve this challenge, a view proposed was that in order to protect individuals against HIV and manage their risk, accurate information and an understanding of the HIV risk were needed (Diaz, 2013). However, other researchers showed a contrary view that knowledge alone was not enough because even with complete knowledge and an accurate perception of risk, an individual may not have the behavioural skills or motivation to implement protective behaviour (Ajzen, Joyce, Sheikh & Cote, 2011).

Akeke *et al*. (2007) found that among the inmates who had heard of HIV/AIDS, 95.8% thought that it was a disease caused by a virus while 2.1% believed that it was a disease caused by witchcraft and another 2.1% thought that the cause was unknown in Lesotho. A study conducted among prison inmates showed that perception of HIV risk was an area that yielded statistically

significant differences in Maryland, USA (Long, 2011). Long (2011) revealed that inmates were substantially more likely to perceive themselves as being at risk of infection when compared to the general population. Contrarily, a study reported that sex workers even felt that their risk of infection was far lower than the general population, apparently because they had the opportunity to be educated about HIV preventive measures compared with other women who might have never had heard about condoms in Nigeria (Ankomah *et al*., 2011). `

A study in Nigeria showed that among the respondents with risk behaviours, being single, Christian, male and listening to the Society for Family Health (SFH) radio campaigns were associated with a higher perception of risk of contracting HIV (Adebayo *et al*., 2010). In addition, a researcher found that male and female inmates were similar in terms of perceptions of risk outside of prison but women were significantly more fearful than men while incarcerated in the USA (Long, 2011). In a different study, female inmates were found to be higher in perceptions of risk when compared to men (Harris & Glaser, 2006). This explains why Long (2011) suggests that prison-based AIDS education programmes must also be tailored towards reducing inmates' level of perceived risk when it is exaggerated.

Some researchers reported that most of the sex workers in Nigeria chose to emphasise that sex was not the only means of HIV transmission (Ankomah *et al*., 2011). Ankomah *et al*. (2011) observed that many of the sex workers played down the sexual transmission aspect and drew attention to the other modes of transmission as a means of ensuring that their behaviour was consistent with their beliefs. These analysts suggested that a key strategy in reducing dissonance among sex workers was through risk-leveling, that is, the strong belief that "everybody was at risk."

1.4.3. HIV-related risk behaviours

This section presents literature on HIV-related risk behaviours among prisoners. It must be noted that there is limited literature on HIV-related risk behaviours among female prisoners as various studies have looked at both male and female prisoners' use of drugs and HIV-related risk behaviours (Jahani *et al*., 2009; Zamani *et al*., 2010). There is a dearth of literature on this topic in

Ghana's case as well (Adjei *et al*., 2006, 2008). This means that it was difficult to get studies that had specifically examined the HIV-related risk behaviours among only female incarcerated persons. Therefore, the analysis here covers studies done on both male and female prisoners.

To start with, it should be understood that substance abuse and risky sexual behaviours are prevalent among prisoners (Hudson *et al*., 2011). Hudson *et al*. (2011) confirmed that substance abuse was a risk factor for risky sexual behaviours and the acquisition of HIV and hepatitis was particularly prevalent among US prisoners.

Sometimes, prisoners acquire infection before incarceration (see Weinbaum & Margolis, 2003). For instance, a survey found that 57% of state prisoners reported the use of illicit drugs in the month before their offense in the US (Weinbaum & Margolis, 2003; Hudson *et al*., 2011). Another study which investigated pre-incarceration and post-release HIV risk behaviours among male and female inmates in a Northern Virginia jail found that although there was a significant decrease in risky behaviour from pre-incarceration to post-incarceration, participants reported high levels of unprotected sexual activity and risky intravenous (IV) drug behaviours at both time points (Adams *et al*., 2013). Adams *et al*. (2013) emphasised the need for prevention programming among this at-risk population.

A study found that HIV-related risk behaviours could be influence-driven by predisposing sexual and socioeconomic risk factors (Adjei *et al*., 2008). Therefore, gender differences have also been a key factor in assessing the HIV-related risk behaviours among prisoners' pre and post incarcerated periods (Adams *et al*., 2013). Adams *et al*. (2013) found an evidence of participants' pre-incarceration and post-release HIV-related risk behaviours and suggested the need for gender-specific interventions to reduce overall HIV risk (Adams *et al*., 2013).

Other studies have compared HIV-related risk behaviours between the general and prison populations (see Glaser & Greifinger 1993). A study among incarcerated persons reported that there were more injection drug use and unsafe sexual practices than the general population in the US (Glaser & Greifinger 1993; Hudson *et al*., 2011). Similarly, a study documented that HIV

outbreaks among drug users in prisons adversely affected HIV prevalence among injection drug users (IDUs) in the general community and there was still evidence of the elevated risk of HIV incidence among prisoners in Tehran, Iran (Zamani *et al*., 2006; Jahani *et al*., 2009; Zamani *et al*., 2010).

Zamani *et al*. (2010) found remarkably high proportions of prisoners in Iran reporting the use of illicit drugs inside prison and that HIV-related risk behaviours they were involved in included shared drug injection. This is the reason why a study suggested that identifying specific HIV-risk behaviours of jail inmates was vital to improving treatment and intervention efforts inside and outside of correctional settings (Adams *et al*., 2013).

Another perspective to why there may be HIV-related risk behaviours in the prison setting could be due to either threat of violence perpetuated by fellow prisoners or intimidation from prison staff (Avert, 2020). The explanation to this is that prisoners commonly operate in an atmosphere of violence and fear since tensions in prisons are often high, including sexual tensions; prisoners often tend to consume drugs or engage in sex to release tensions and the boredom of prison life. (Harm Reduction International, 2018; Avert, 2020). In agreement with this assertion, many studies have reported high levels of risky behaviours and HIV transmission in prisons (Jürgens, Nowak & Day, 2011; Izenberg *et al*., 2014). Other studies have also shown that prisoners tend to be engaged in risky behaviours such as drug use involving sharing contaminated injection equipment, unprotected sex with multiple partners and unsafe tattooing practices (Hunt & Saab, 2009; Peña-Orellana, Hernández-Viver, Caraballo-Correa & Albizu-García, 2011).

A similar observation of HIV risky behaviours was made between Ghana and the southern parts of the United States of America where a high prevalence of blood-borne and sexually transmitted infections were reported among female prison inmates and officers (Farley, 2006; Adjei *et al*., 2008; Fazel & Baillargeon, 2011). The selected HIV-related risk behaviours among female prisoners that could contribute to HIV infection have been explained below;

Drug use and drug injecting

One of the HIV-related risk behaviours that could be adopted in prison is drug use and drug injection use. Some studies showed that imprisonment was a common event for people who injected drugs, with studies reporting that between 56% and 90% of people who injected drugs had been imprisoned at some stage (Beyrer *et al*., 2003; Jürgens, Csete, Amon, Baral & Beyrer, 2010; Jürgens *et al*., 2011). Dolan *et al*. (2015) reported that multiple prison sentences were more common for prisoners who injected drugs than for other prisoners. Other researchers argued that prisons were also places where drug use was initiated, often to release tension and to cope with being in an overcrowded and often violent environment (Chu & Peddle, 2010; Jürgens *et al*., 2011). Some researchers also argued that many drug users stopped using and injecting drugs when imprisoned and other prisoners began to use drugs or would switch the route of drug administration if their preferred drug was unavailable (Fazel *et al*., 2006; Dolan *et al.*, 2015).

There are differences between males and females when it comes to the use of drugs (Iakobishvili, 2012). Some researchers reported that incarcerated women were much more likely to have a drug problem than male prisoners. They are more likely to have been imprisoned for a drug offence than incarcerated men (Iakobishvili, 2012; Strathdee *et al*., 2015). Dolan *et al*. (2015) argued that the prevalence of drug use among female prisoners was much higher than their male counterparts and drug treatment options were usually more limited for female prisoners than for male prisoners.

It could be realised that many studies have reported high levels of injection drug use among female prisoners (DiCenso, Dias & Gahagan, 2003; Martin *et al*., 2005; Jürgens *et al*., 2011). This was confirmed in various researches conducted on injection drug use in prisons in high, low and middle income countries; all reporting similar results (Jürgens *et al*., 2011). For instance, studies from developing countries such as Pakistan and Nepal indicated high levels of injecting and sharing of equipment (Zindagi, 2009; Dolan & Larney, 2009; Dolan *et al*., 2015). Contrarily, other researchers reported low levels of injection drug use (IDU) in prisons in selected African geographical regions (i.e., East and Southern Africa and West and Central Africa) (da Rosa *et al*., 2012; Moazen *et al*., 2018).

Jürgens *et al*. (2011) contended that people who injected drugs in prisons often shared needles and syringes and other injecting equipment. This was an efficient way of transmitting HIV (Jürgens *et al*., 2011). Similarly, other researchers explained that sharing of equipment used for injection drug use (IDU) was a substantial cause of disease burden and a contributor to blood-borne virus transmission (Degenhardt *et al*., 2017).

The reason why equipment such as needles and syringes could be used/re-used is due to the reality that such equipment is limited in the prison setup (Dolan *et al*., 2016). Dolan *et al*. (2016) confirmed this view that needles and syringes are scarce in the prison setting. Consequently, the assumption is that, with a few needles and syringes circulating among many drug-injecting inmates, sharing of same or similar equipment could be inevitable and obviously up to 15 or 20 individuals may inject with the same equipment (Dolan *et al*., 2016).

A study observed that in the absence of sterilised injecting equipment, women, like men, injected with either used needles or home-made syringes (Walker, Seear, Higgs, Stoové & Wilson, 2019). Similarly, other studies reported that some prisoners made their own syringes with needle substitutes fashioned out of hardened plastic and ball-point pens, often causing damage to veins and scarring (EMCDDA, 2012; Dolan *et al*., 2016). All these improvisations hamper any efforts to decontaminate the equipment (Dolan *et al*., 2016). As a result, studies showed that women who injected drugs were more likely to become infected with HIV than men who injected drugs, as they had limited access to information, health services and safe injecting equipment (Fazel *et al*., 2006; Degenhardt *et al*., 2010).

Tattooing / Body piercing

Tattooing and body piercing have also been reported as one of the HIV-related risk behaviours that could be adopted in prison (Tran, Dubost, Baggio, Gétaz & Wolff, 2018). Tran and colleagues (2018) reported that about 60% of prisoners had secretly had tattoos in prison and this practice was associated with risks of blood-borne infections. Similarly, other researchers argued that tattooing and body piercing practices existed in prison and could constitute risks of transmission of blood-

borne viral infections (Abiona, Balogun, Adefuye & Sloan, 2010). Abiona *et al*. (2010) contended that getting tattoos while in detention was reported to be a common practice among both men and women (see Tran *et al*., 2018).

In addition, tattooing in prison represents a unique combination of risk factors for blood-borne virus transmission because it is illicitly performed by untrained people with home-made, unsterilised and frequently shared equipment (Hellard, Aitken & Hocking, 2007). Hellard *et al*. (2007) reported that acquiring a tattoo in prison was common and the reports of sharing the tattooing needle and ink was high, placing prisoners at risk of acquiring hepatitis C virus (HCV) through tattooing.

Tran *et al*. (2018) reported that people who were tattooed in prison rarely reported a single use of tattoo equipment, arguing that even if cleaning took place, it was reportedly done with water and/or heat. For instance, a survey involving 4,425 participants across Canadian prisons showed that about 13% had a tattoo done in prison and were unsure about equipment safety (Robinson & Mirabelli, 1996; Tran *et al*., 2018). Similarly, another study reported that prisoners had a variety of reasons for getting body art. The equipment used was often shared and cleansing agents were not readily available (Abiona *et al*., 2010).

Other researchers argued that regardless of the purpose for tattooing or piercing, once a sharp tool (needle, razor, knife and so forth) pierces a person's skin, blood and tissue fragments will adhere to the tool and while the same tool is being used on another, the blood and fragments will specifically be exchanged into the circulatory system of the next individual (Amuche, Emmanuel & Innocent, 2017). Similarly, a study contended that tattooing involves skin piercing and potential blood contact, noting that unsafe tattooing carries an increased risk of poor health outcomes (Tran *et al*., 2018).

Studies also showed that people who had ever injected drugs were twice more likely to get tattooed in prison than those who had never injected drugs (Dolan *et al*., 2016; Tran *et al*., 2018). This was confirmed in another study which reported that prisoners with a history of drug injection were

more likely to have a tattoo and to have acquired a tattoo in prison (Hellard *et al*., 2007). Hellard and colleagues (2004) also reported that tattooing was significantly associated with being tested positive to hepatitis C virus (HCV) even when adjusting for other risk behaviours (see Moazen *et al*., 2018). In addition, tattooing was identified as an independent risk factor for in-prison HCV transmission (Hellard, Hocking & Crofts, 2004; Moazen *et al*., 2018). This could be the reason why some researchers argued that piercing in prison and the insertion of beads under the skin could transmit HIV (Yap *et al*., 2013; Bjekić, 2013; Moazen *et al*., 2018).

Sexual violence and high-risk sexual behaviour

Other HIV-related risk behaviours that could be adopted in prison are sexual violence and high-risk sexual behaviour. For instance, documents have revealed that the prevalence of sexual activity in prisons was largely unknown and believed to be significantly underreported due to denial, fear of stigma, homophobia and the criminalisation of same sex conduct in some jurisdictions (Joint United Nations Programme on HIV/AIDS (UNAIDS), 2015; Avert, 2020). However, some researchers argue that the HIV epidemic is driven by injection drug use and sexual behaviour. Estimates of prison-based sexual behaviour vary widely (Prejean *et al*. 2011; Rowell-Cunsolo, Szeto, Sampong & Larson, 2016).

Rowell-Cunsolo and colleagues (2016) contend that sexual behaviour during incarceration is an institutional misconduct and punishable, regardless of whether it is consensual or non-consensual, and can result in a variety of sanctions. Prisoners are sexually active during imprisonment (Fleisher & Krienert, 2009; Rowell-Cunsolo *et al*., 2016) and life during detention also alters the pattern of sexual activity with couples (Ammar *et al*., 2015; Nugrahani, Kusumaningsih, Kholida, Kholifah & Yusuf, 2018). A review of studies conducted between 2007 and 2017 reported that the highest levels of sexual activity in prison (both consensual and non-consensual) took place in Europe and North America (about 12% of prisoners) and West and Central Africa (about 14%) while prisoners in the Middle East and North Africa were less likely to be sexually active (1.5%) (Moazen *et al*., 2018; Avert, 2020).

A study confirmed that inmates actively engaged in sexual activity during their time of punishment (Rowell-Cunsolo *et al*., 2016; Nugrahani *et al*., 2018). That notwithstanding, the other argument adduced regarding the conduct of HIV-related risk behaviours was that since sexual activities were often forbidden in prisons, with some believing that the provision of condoms condones such behaviours, it could mean that the lack of such preventive measures could lead to an increase in HIV infection when inmates engaged in sexual acts without condom (Avert, 2020).

However, various studies have found this not to be the case since an Australian study of prisons in New South Wales (where condoms were freely distributed) and Queensland (where they were not) found no evidence that condom provision could increase consensual or non-consensual sexual activity in prisons (Butler, Richters, Yap & Donovan, 2013; Avert, 2020). Nevertheless, this study found evidence that where condoms were available, they were used by prisoners who engaged in anal sex (see Butler *et al*., 2013; Avert, 2020).

Contrarily, a survey of more than 2,000 Australian prisoners found that about 7% reported having sex without a condom in prison with other prisoners and around 3% admitted to being coerced into sexual acts (Avert, 2020). Similarly, two large US surveys found that between 2% and 4% of prisoners reported being sexually victimised while other studies conducted in African prisons reported that sex was being exchanged for food, sleeping space and commodities (Kamarulzaman *et al*., 2016; Avert, 2020). Other researchers argued that sexual behaviour in prison could also be affected by using drugs and sexual activity could also lead to violent behaviour as well as stigmatisation in the prison environment (Rowell-Cunsolo *et al*., 2016; Nugrahani *et al*., 2018).

Some researchers found that characteristics such as race, age, sexual orientation and gender could consistently affect sexual activity and that certain characteristics could increase the likelihood of engaging in sexual behaviour in prison environments (Gibson & Hensley, 2013; Rowell-Cunsolo *et al*., 2016; Nugrahani *et al*., 2018). Rowell-Cunsolo *et al*. (2016) observed that sexual behaviour between female prisoners and male prisoners was different as 46% of male prisoners had actively engaged in sexual activity while 44% of female detainees had performed sexual activity during imprisonment (Rowell-Cunsolo *et al.,* 2016).

In addition to gender, past sexual activity and sexual orientation prior to prison may possibly influence sexual activity during the period of detention (Rowell-Cunsolo *et al*., 2016; Nugrahani *et al*., 2018). It was also documented in previous studies that incarceration duration was associated with prison-based sexual behaviour (Abiona *et al*., 2009; Rowell-Cunsolo *et al*., 2016). Rowell-Cunsolo *et al*. (2016) confirmed that only findings in the multivariable logistic regression analyses with male participants supported this relationship. Some researchers explained that the longer a convict served a sentence and stayed in prison, the more likely the prisoner engaged in sexual activity with a deviant sexual orientation (Gibson & Hensley, 2013; Nugrahani *et al*., 2018). Nugrahani *et al*. (2018) reported that unlike women who experienced a decrease in sexual desire, male prisoners tend to continue to have these desires.

Some researchers observed that while some sexual activities in prisons are consensual, rape and sexual abuse are used to exercise dominance over other prisoners (Stevens, 2017; Avert, 2020). Other researchers reported that sexual activity in male prisoners might include rape, oral sex, fondling, sex through fingers as well as sexual activity affected by drugs (Banbury, Lusher & Morgan, 2016; Nugrahani *et al*., 2018). Conversely, female prisoners are also vulnerable to sexual assault including rape by both male prisoners and male prison staff (Avert, 2020). Furthermore, they are at risk of sexual exploitation and may engage in sex for the exchange of goods (United Nations Office on Drugs and Crime (UNODC), 2008; Avert, 2020). A review found that women prisoners in Sub-Saharan Africa were at 'extreme risk' of physical abuse by other female prisoners, the police and prison officials (Van Hout & Mhlanga-Gunda, 2018).

Van Hout and Mhlanga-Gunda (2018) reported that while evidence of physical and sexual abuse perpetrated by police and prison officers were found in Malawi, Zambia and Nigeria, sexual abuse and sexual exploitation were reported in South Africa, Zambia and Nigeria (see Avert, 2020). Similar evidence was indicated in a study that 22% of female inmates reported being subjected to prisoner-on-prisoner sexual victimisation (most often abusive sexual contact such as inappropriate touching) in the last 6 months and, at least, a type of staff-on-prisoner sexual victimisation was reported by 8% of female inmates in the USA (Wolff, Blitz & Shi, 2007; Strathdee *et al*., 2015).

1.4.4. Female prisoners and the availability of HIV-related health facilities

This section presents analysis of studies that have analysed the availability of HIV-related health facilities for prisoners, especially female prisoners. This has implications on the health promotion education and treatment of conditions such as HIV/AIDS. There appears to be a challenge with the provision of adequate healthcare facilities in the prisons due to structural issues (Reyes, 2000). Reyes (2000) argued that most prison systems were designed with male inmates in mind. This explains why living conditions for women prisoners are often not tailored to their specific needs.

Other researchers have argued that existing prison facilities, programmes and services for women inmates initially were developed for men who account for the larger proportion of prison populations (Strathdee *et al*., 2015). Coyle and Fair (2018) agreed to this assertion by explaining that this is because there are more men in prison than women. These researchers argued that one of the consequences of the small proportion of female prisoners was that prisons and prison systems tend to be organised based on the needs and requirements of male prisoners. This applies to the architecture, security and all other facilities. Therefore, any special provision for women prisoners is usually an addition to the normal male provision (Coyle & Fair, 2018). Nonetheless, this has not been provided in many prisons around the world as the United Nations' standard minimum rules acknowledged that separate provision of facilities for women in prison could be expensive (Huber, 2016).

The challenge is compounded by the fact that health services in prison settings are generally poor or substandard and usually under-funded (UNODC, 2010). The United Nations Office on Drugs and Crime concedes that these health services are mostly characterized by shortage of staff and essential medications and often healthcare provision in prison settings is isolated from the general healthcare system, hampering the quality of health care (UNODC, 2010). Another facet of the challenge is the limited funding for HIV prevention and treatment, harm reduction in prisons and

the lack of funding for appropriate training of correctional staff which have become important economic barriers (Sumartojo, 2000; Strathdee *et al*., 2015).

Against these levels of deficiencies in the provision of healthcare in the prison environment, some analysts have demonstrated the need to provide adequate health infrastructure for prison settings in order to ensure equity and equality in access (Coyle & Fair, 2018). This point is made cogent by Coyle and Fair (2018) who argued on the basis of the rights of the prisoner that those who are imprisoned should also retain their fundamental right to enjoy good health, both physical and mental, and they should retain their entitlement to a standard of medical care which is, at least, the equivalent to that which is provided in the wider community.

In the absence of such a provision, it is reported that prisoners experience high HIV disease burdens (Das & Horton, 2016). Das and Horton (2016) argued that prisoners have little or no access to HIV treatment, prevention and care and due to their legal status as prisoners, they are discriminated against by the criminal justice system. This in turn perpetuates the high HIV transmission rates.

Other researchers also suggested that there was the need for correctional facilities to offer an opportunity to provide women with HIV testing and prevention services so that they would know their status and receive counselling for HIV/sexually transmitted diseases (STDs), risk reduction and other preventive services (Fleming, LeBlanc & Reid, 2013). Similarly, Luther and colleagues argued that since HIV-positive women prisoners may have little access to HIV/AIDS services in the community, their time in prison or jail may present an important opportunity to learn about their HIV infection, cope with their diagnosis, understand their medical options and develop the skills to avoid passing on the virus to anyone else (Luther, Reichert, Holloway, Roth & Aalsma, 2011). This is further supported by other researchers who contend on the grounds that this provision is needed since incarcerated women are often poor, have limited access to healthcare in both jails and prison settings and are convicted primarily of drug-related crimes (Mauer, 2013; Kramer & Comfort, 2011; Fleming *et al*., 2013).

Despite the high risk of HIV transmission among prisoners, HIV prevention and treatment programmes are often limited in prisons and other closed settings (Avert, 2020). The argument available shows that even where HIV prevention and treatment programmes do exist, they rarely link to national HIV prevention programmes (Avert, 2020). Similarly, this point is explained in terms of other healthcare interventions like reproductive healthcare which might be limited or unavailable and health promotion materials, information and treatment (including for HIV and drug dependence) are often more limited in women's prisons than in prisons for men (UNODC, 2008).

Nonetheless, it is reported that the prison setting presents not only challenges but also opportunities for the prevention and treatment of HIV, viral hepatitis and tuberculosis (Dolan *et al*., 2016). Dwyer *et al*. (2011) argued that caring for HIV-infected patients who are incarcerated is a complex and challenging task because for many of these patients, the prison health service provides their first opportunity for access to consistent healthcare, where available.

Further arguments advanced in this direction showed that there was the need to make HIV testing and counselling (HTC) readily available on entry to prison and throughout incarceration (Avert, 2020). Contrarily, the seeming challenge to this proposal is how to address HIV counselling and testing with adequate protection of confidentiality and consent in view of the reality that the provision of antiretroviral treatment and treatment for opportunistic infections such as tuberculosis (TB) and of psychosocial support for the inmates are not adequately implemented as part of prison health services (UNODC, 2008). Another perspective to this challenge is the issue of seeming lack of social support for women prisoners (Strathdee *et al*., 2015). Strathdee *et al*. (2015) confirmed this notion by arguing that since women's usual social support networks are disrupted or absent within prison settings, it could lead them to resist HIV testing or be discouraged from seeking HIV care and treatment (Strathdee *et al*., 2015).

Ideally, HIV testing of prisoners should involve pre and post-test counselling in order to provide information about the test results, risk assessment, partner notification and treatment options (Centers for Disease Prevention and Control (CDC), 2006; Zaller, Thurmond & Rich, 2007). On

the contrary, this is not the case in some prisons where there is compulsory or mandatory testing which requires that all prisoners should have an HIV test, as a means of identifying those who are living with HIV (UNODC, 2006; Avert, 2020). Other analysts have attempted to provide a justification for this approach, noting that mandatory testing serves as a means of identifying inmates who need HIV treatment (Hammett, 2006). Hammett (2006) argued that mandatory HIV testing and segregation of prisoners based on their HIV status were adopted primarily to prevent HIV transmission, nonetheless, there were serious shortcomings in this regard, including the harmful effects of stigma, discrimination and mistreatment.

Supporting this view, some researchers reported that close to a quarter of participants from a prison with compulsory testing did not report of receiving an HIV test, suggesting they might not have been aware that an HIV test was performed (MacGowan et al., 2006). This could be explained by the reason that consent was not obtained for an HIV test or participants were not notified of their test results or both (MacGowan *et al*., 2006; UNODC, 2009). Another supporting evidence was that HIV prevention programmes were rarely made available to prisoners and many prisoners with HIV were unable to access lifesaving Antiretroviral Treatment (ART), meaning that these services are very limited for prisoners in general and for women (UNAIDS, 2019; Avert, 2020).

The human rights proponents also showed that mandatory testing and segregation of prisoners living with HIV breach human rights by taking away the right of the individual to make their own decisions and it is also costly and inefficient (Hammett, 2006; Avert, 2020). In addition, this contravenes the international prison recommendations which state that voluntary and confidential HIV counselling and testing (VCT) should be available to prisoners and mandatory or compulsory HIV testing should be rejected (UNODC, 2006). A document explained this in details by informing that voluntary testing should only be carried out with the informed consent of the prisoner and effective support should be available when prisoners are notified of test results as well as ensuring medical confidentiality of HIV test results of prisoners (WHO, 1993; UNODC, 2006).

The other point of view to this rejection is on ethical grounds; the ethical problems and potential disadvantages of mandatory testing seem to outweigh the advantages (Hammett, 2006). Hammett

(2006) posits that since people in the general community are not subjected to mandatory testing, inmates should also have the right to make their own informed choices. This is confirmed by an international document which stated that compulsory testing of prisoners for HIV was unethical and ineffective and should be prohibited (World Health Organisation (WHO), 1993).

Above all the issues discussed in relation to the testing of prisoners, there is an issue of a lack of adequate nutrition during treatment. The poor nutritional status of prisoners and, especially of women, could, in some countries, become a hindering factor to providing adequate treatment to HIV positive prisoners (United Nations Office on Drugs and Crime (UNODC), 2008). Strathdee and colleagues argued that a few countries could provide the type and coverage of HIV programmes in prison which would be similar to what was provided in the community (Strathdee *et al*., 2015). For instance, few countries provided ART, Medication Assisted Treatment for Opioid Dependence (MATOD), prevention of mother-to-child HIV transmission or operated Needle and Syringe Programmes (NSPs) in prison, demonstrating a missed opportunity for HIV prevention and treatment (Dolan, 2014; Strathdee *et al*., 2015).

This is also exacerbated by the fact that female prisoner population is usually low to warrant a specific HIV intervention (Strathdee *et al*., 2015). On this score, Strathdee *et al*. (2015) contended that women prisoners present specific challenges for correctional authorities because they constitute a very small proportion of the prison population. These researches argued that the profile, background and reasons for which women are imprisoned differ from those of incarcerated men.

In view of the above, it has been recommended that prison facilities, programmes and services must be tailored to meet the needs of women offenders (Strathdee et al, 2015). Similarly, other researchers recommended that to be gender responsive, HIV/AIDS programming for women and girls also need to be fully gender inclusive (Sevelius, Keatley & Gutierrez-Mock, 2011).

1.5. Chapter summary

In this chapter, the concepts underlying the study and a review of related literature on the topic under study have been presented. The key sections of this chapter, which included HIV and AIDS, the epidemiology and dynamics of HIV/AIDS, HIV and prisoners, level of HIV/AIDS knowledge, HIV-risk perception, HIV-related risk behaviours, female prisoners and availability of HIV-related health facilities, helped to show the extent to which earlier researchers had addressed some of the issues based on which the gaps were identified to justify the need for this current study. In the next chapter, the theoretical framework and public health concepts have been presented.

CHAPTER TWO

THEORETICAL FRAMEWORK AND PUBLIC HEALTH CONCEPTS

2.0. Introduction

This chapter presents the theoretical perspectives underlying the study of HIV/AIDS based on literature analysis. The chapter is presented according to sections covering four (4) theoretical frameworks guiding the study. These are; the Health Belief Model, AIDS Risk Reduction Model, Stages of Change Theory and Theory of Reasoned Action. The review of the theoretical frameworks brings out their key arguments and applicability to the present study. The chapter ends with a summary where the main ideas have been summed up.

2.1. Theoretical framework

Generally, knowledge and attitude studies are used in designing health promotion and education programmes used to impact knowledge and alter attitudes and risky behaviours (Marais & Wilson, 2002; Akeke, Mokgatle & Oguntibeju, 2007). To this end, Pisani *et al*. (2003) argue that understanding the dynamics of HIV infection within a country, how it changes over time and who is currently at greatest risk are essential for guiding decisions about effective prevention programmes (Pisani *et al*., 2003). Nonetheless, some researchers note that several attempts have been made to slow the HIV epidemic globally which have led to a clearer understanding that the HIV battle is not just about using condoms or adherence to medication (Bertozzi *et al*., 2006; Kaufman, Cornish, Zimmerman & Johnson, 2014).

Several studies have shown that HIV risk and AIDS care involve complex behaviours influenced from multiple levels such as from an individual's knowledge, attitudes, emotions and risk perception to power dynamics between partners, accessibility of services, economic inequalities, criminalisation of vulnerable groups as well as policies that make HIV a priority health issue (Gupta, Parkhurst, Ogden, Aggleton & Mahal, 2008; Campbell & Cornish, 2010; Seeley *et al*., 2012; Kaufman *et al*., 2014). However, traditional approaches to HIV prevention have been vital in educating populations about HIV risk factors and risk reduction strategies. Additionally, many

of these interventions have been found to be cost-effective even though they have yielded little success in slowing the AIDS epidemic (Avert, 2020). Therefore, some researchers have highlighted the need for new combination approaches to complement existing prevention efforts as well as efforts to stimulate individual demand for prevention (Coates, Richter & Caceres, 2008; Gupta *et al*., 2008; Avert, 2020).

HIV prevention programmes are usually based on theories about why people change their behaviours (see Gallant & Maticka-Tyndale, 2004). Gallant and Maticka-Tyndale (2004) noted that the high rate of HIV infection among the youth in Africa has prompted both national and international attention calling for the need to educate more often because education and prevention programmes are seen as the primary way of decreasing this rate, suggesting that knowledge and attitudes are easier to change but behaviours are much more challenging. Though these underlying principles may not be formally recognised as theories, they focus on HIV prevention elements believed to be essential for individuals to apply and sustain behaviour change (Gupta *et al*., 2008).

Kaufman *et al.* (2014) argue that a lot of individual-level theories have played prominent roles in past behavioural interventions which focused on HIV prevention and AIDS care. These theories include mainly the Social Cognitive Theory, Theories of Reasoned Action and Planned Behaviour, Transtheoretical Model and Information, Motivation, Behavioural Skills Model (Kaufman *et al*., 2014). Though these models mainly focus on the individual level, they have been associated with significant behavioural change across a range of groups with varying risk levels (Johnson, Scott-Sheldon & Carey, 2010; Kaufman *et al*., 2014).

Traube and colleagues argue that in the presence of numerous health behaviour theories, it is difficult to determine which of the many theories is most precise in explaining health-related behaviour. In addition, new models continue to be introduced despite existing difference, overlap and lack of unification among health promotion theories (Traube, Holloway & Smith, 2011). Nonetheless, the four (4) commonly cited behaviour change theories found in HIV/AIDS prevention literature used in this analysis are; Health Belief Model (HBM), AIDS Risk Reduction

Model, Stages of Change and Theory of Reasoned Action (Family Health International (FHI360), 2020; Kaufman *et al*., 2014).

2.1.1. Health Belief Model

Generally, the Health Belief Model (HBM) was one of the first models adapted from the behavioural sciences to health-related problems and has been one of the most widely recognised conceptual frameworks of health behaviour (Rosenstock, Stretcher, & Becker, 1994; Orji, Vassileva & Mandryk, 2012). Other researchers argue that the Health Belief Model (HBM) is one of the oldest models but still provides an important framework for designing theory-based interventions (Becker, Maiman, Kirscht, Haefner & Drachman, 1977; Hammond, & Niedermann, 2010).

Some researchers have observed that the Health Belief Model emerged in the early 1950s by social scientists during a time in history when a number of preventive health services were available. This was to understand why people fail to adopt disease prevention strategies or practice preventive health measures (see Orji *et al*., 2012; LaMorte, 2018). Laranjo (2016) argues that the HBM suggests that people are most likely to take preventative action if they perceive the threat of a health risk to be serious, if they feel they are personally susceptible and if there are fewer costs than benefits in engaging in it.

Rosenstock *et al*. (1994) explained that the HBM was designed to explain beliefs that should be targeted in communication campaigns to cause positive health behaviours. Other researchers have observed that the Health Belief Model is a theoretical structure developed to explain why and under what conditions people will take preventive actions (Skinner, Tiro & Champion, 2015). Snetselaar and Delahanty (2017) argued that the health belief model attempts to explain and predict health behaviours by focusing on the attitudes and beliefs of individuals.

Furthermore, the HBM was developed to address behaviours that evoke health concerns and it was based on an assumption that people fear diseases (Glanz, 2001; LaMorte, 2018). It is explained

that health actions are motivated in relation to the degree of fear (perceived threat) and expected actions that have the potential to reduce that fear, as long as that potential outweighs the practical and psychological obstacles when such actions have been taken (net benefits) (see Glanz, 2001; LaMorte, 2018).

Similarly, other analysts have argued that the HBM assumes that health-related behaviours depend on the combination of several factors namely perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action and self-efficacy (Kagee & Freeman, 2017). The first four (4) concepts were developed as the original creeds of the HBM while the last two were added as research as the HBM evolved (LaMorte, 2018). Other researchers explained that the Health Belief Model (HBM) tries to conceptualise two types of health beliefs that make a behaviour in response to an illness more or less attractive: perceptions of the threat of illness and evaluation of the effectiveness of behaviours to counter this threat (Abraham & Sheeran, 2015). The six (6) key concepts of the Health Belief Model have been explained below.

Perceived susceptibility

The perceived susceptibility refers to an individual's view of the chances of contracting the illness or health condition (Glanz, 1995; Kagee & Freeman, 2017). LaMorte (2018) explained that perceived susceptibility of the Health Belief Model refers to a person's personal perception of the risk of acquiring an illness or disease and that there is a wide variation in a person's feeling of personal vulnerability to an illness or disease. Some researchers argue that perceived susceptibility is a stronger predictor of preventive health behaviour (Becker, 1974; Janz & Becker, 1984; Jones *et al*., 2015).

Perceived benefits

Some researchers argue that both perceived susceptibility and perceived benefits are important predictors of protective health behaviour (Becker, 1974; Janz & Becker, 1984; Jones *et al*., 2015). Therefore, the concept of perceived benefits refers to an individual's belief in the effectiveness of the recommended health behaviour or intervention in reducing the risk or seriousness of the condition (Kagee & Freeman, 2017). Jones *et al*. (2015) argue that the concept of perceived

benefits of the HBM posits that people will take action to prevent illness if they believe that a particular course of action available to them would reduce the susceptibility or severity or lead to other positive outcomes (Jones *et al*., 2015).

Perceived severity

Kagee and Freeman (2017) argue that the perceived severity of the HBM refers to an individual's view about the seriousness of contracting an illness or a health condition and its consequences. LaMorte (2018) observed that there is a wide variation in a person's feeling of severity. Often, a person considers the medical consequences (e.g., death, disability) and social consequences (e.g., family life, social relationships) when evaluating the severity.

Perceived barriers

The concept of perceived barriers refers to the perception of cost associated with adhering to a recommended health behaviour if it is likely to be beneficial in reducing or eradicating the perceived threat (Kagee & Freeman, 2017). Jones and colleagues argue that the concept of perceived barriers of the HBM posits that people will take action if they perceive few negative attributes related to the health actions (Jones *et al*., 2015). In addition, studies reveal that perceived barriers are the strongest predictors of a health behaviour (Janz & Becker, 1984; Carpenter, 2010; Jones *et al*., 2015). Jones *et al*. (2015) reported that perceived barriers consistently mediated the relationship between exposure and behaviour, implying that researchers and practitioners should focus their efforts on identifying and countering perceived barriers to condom use.

Cues to action

The concept of cues to action refers to an individual's exposure to factors that prompt an action (Kagee & Freeman, 2017). Generally, the HBM suggests that specific cues such as factors in an individual's environment can impact the final action one takes (Champion & Skinner, 2008; Jones *et al*., 2015). Bish and Michie (2010) observe that the cues to action of the HBM can be internal or external, ranging from experiencing symptoms of an illness to exposure to a campaign (see Jones *et al*., 2015). Some researchers argue that the concept of cues to action has not been

systematically evaluated, considering its often brief nature (Champion & Skinner, 2008; Jones *et al*., 2015).

Jones *et al*. (2015) observe that the cues to action remain a small construct within the larger HBM framework, hence, continued clarification of the construct should examine whether it is beneficial to separate external and internal cues to action as well as manipulated cues (e.g., campaigns, interventions) and naturally occurring cues (e.g., news stories, sudden illness in the family).

Self-efficacy

The concept of self-efficacy refers to the level of confidence in an individual's ability to perform the new health behaviour in question (Bandura, 1977). Furthermore, persons who have low self-efficacy will have low confidence in their ability which will have an effect on the likelihood of the behaviour being performed (Glanz, 1995; Kagee *et al*., 2017). In addition, self-efficacy is the belief that an individual can successfully complete the behaviour of interest despite the considered barriers (Rosenstock *et al*., 1988; Jones *et al*., 2015).

Some researchers argue that self-efficacy is rarely included in the HBM studies (Carpenter, 2010; Jones *et al*., 2015). Snetselaar and Delahanty (2017) observe that the motivation for change depends on the presence of a sufficient degree of perceived risk in combination with sufficient self-efficacy relative to achieving behavioural change. Perceived risk without self-efficacy tends to result in defensive cognitive coping such as denial and rationalisation, rather than behaviour change (Snetselaar, & Delahanty, 2017).

The above-mentioned six health constructs identified by the HBM together provide a useful framework for designing both long and short-term health behaviour interventions (Glanz, 1995). Laranjo (2016) explains that behaviour change interventions are more effective if they address an individual’s specific perceptions of susceptibility, benefits, barriers and self-efficacy. Additionally, the most promising use of the health belief model in designing interventions is that it serves as a foundation for developing messages that may persuade individuals to make healthy decisions (Glanz, 2001). The HBM has been adapted and applied successfully in the design of

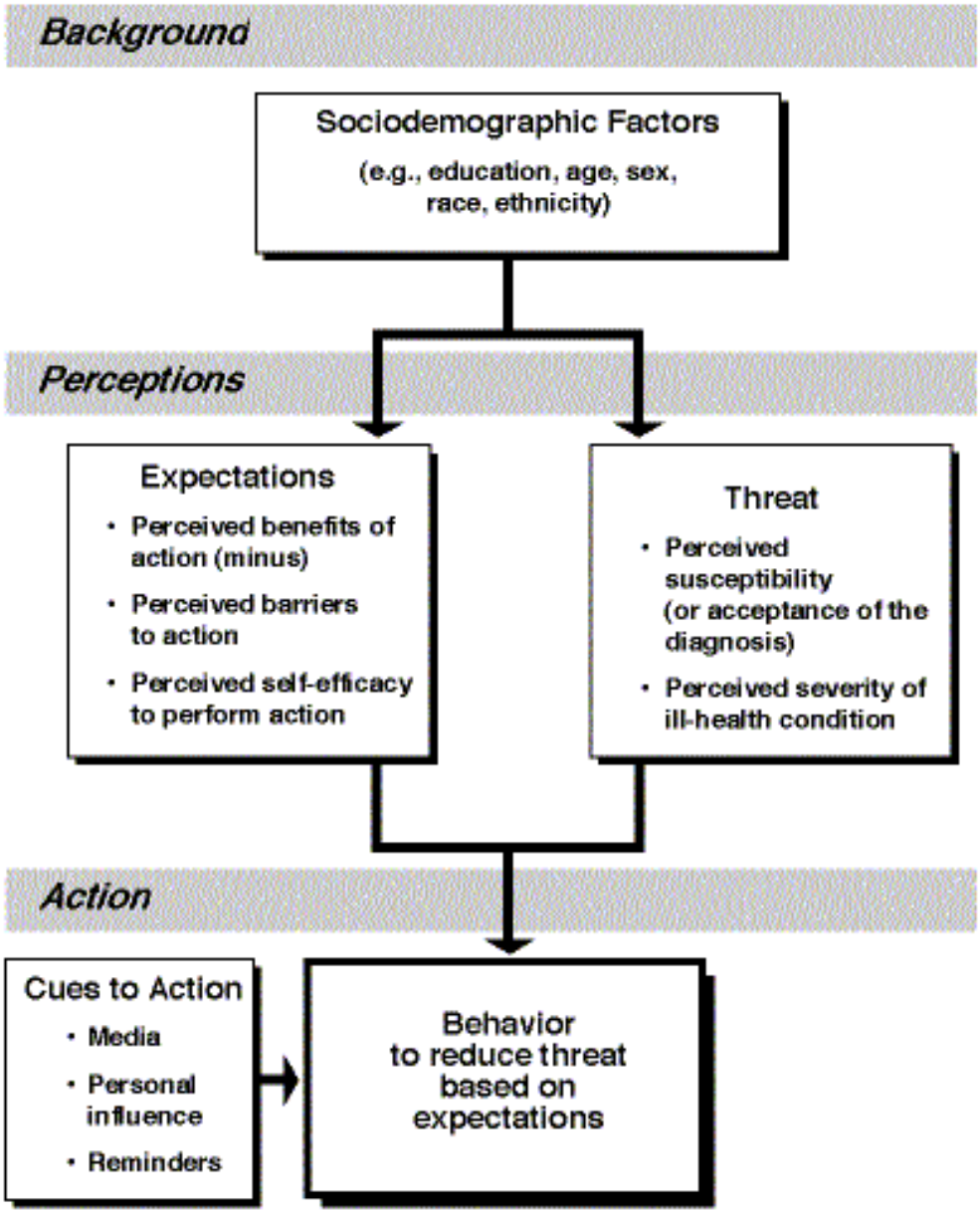
health interventions for a range of health behaviours and populations (see Peng, 2009; Orji *et al*., 2012; Kagee and Friedman, 2017).

Nonetheless, it has been explained that the HBM has several limitations which limit its utility in public health (LaMorte, 2018). For instance, the HBM does not take into account behaviours that are habitual and, thus, may influence the decision-making process to accept a recommended action (e.g., smoking). In addition, the HBM does not take into account Behaviours that are performed for non-health related reasons such as social acceptability (LaMorte, 2018).

Some researchers have argued that the HBM fails to specify variable organization and this limitation is important for researchers interested in using the HBM to understand communication processes as numerous process-oriented questions are raised by the model that have no answers (Champion & Skinner, 2008; Jones *et al*., 2015). In addition, the HBM does not account for environmental or economic factors that may forbid or promote the recommended action and assumes that everyone has access to equal amounts of information on an illness or a disease (LaMorte, 2018).

Furthermore, some researchers note that the HBM has been critiqued for not completely addressing several behavioural determinants including socio-cultural factors and assuming that health is a priority for most individuals, thus, it may not be applicable to those who do not value their health (Mimiaga, Reisner, Reilly, Soroudi & Safren, 2009). LaMorte (2018) argues that the HBM is most effective when it is integrated with other models that account for the environmental context and suggest strategies for change (LaMorte, 2018). Therefore, there is the need to look at other models or frameworks. The AIDS Risk Reduction Model is described below.

Figure 2.1: Health Belief Model (HBM)



(Rosenstock, Stretcher & Becker, 1994).

2.1.2. AIDS Risk Reduction Model

The AIDS Risk Reduction Model (ARRM) was introduced in 1990 to provide a framework for explaining and predicting the behaviour change efforts of individuals with regards to the sexual transmission of HIV/AIDS (Catania, Kegeles & Coates, 1990). Mimiaga and colleagues note that the AIDS Risk Reduction Model (ARRM) is one of numerous stages of change models that posit behaviour change to be a process in which individuals move from one step to the next as a result of a given stimulus (Mimiaga *et al*., 2009).

Some researchers argue that the AIDS Risk Reduction Model (ARRM) is a conceptual model designed to explain the influence of knowledge and attitudes about AIDS/HIV on risk-related behaviours (Lanier & Gates, 1996). Other researchers explain that the ARRM hypothesises that behaviour change is a process occurring in three stages: labeling one's behaviour as problematic, making a commitment to behaviour change and taking action to accomplish that change (Kowalewski, Longshore & Anglin 1994). These have been explained below.

Stage 1: Recognition and labeling of one's behaviour as high risk

Durojaiye (2011) notes that the first stage of ARRM is recognising and labeling an individual's behaviour as high risk and it is influenced by knowledge of HIV transmission methods, belief that one is susceptible and that AIDS is undesirable. Some researchers argue that for individuals who accurately exhibit high risk behaviours, three factors are hypothesised to influence labeling of their sexual behaviours as problematic: knowledge of sexual activities associated with HIV transmission, believing that one is personally susceptible to contracting HIV and believing that having AIDS is undesirable (Catania *et al*., 1990; Mustanski, Newcomb, Du Bois, Garcia & Grov, 2011).

Durojaiye (2011) reports that individuals who have accurate knowledge of HIV/AIDS are more likely to view HIV as unwanted/undesirable and will use condoms for protection. Other researchers argue that relatively high knowledge of sexual transmission of HIV does not translate into personal susceptibility to HIV (Oster, 2012; Connell, Crawford, Dowsett & Kippax, 2013).

Durojaiye (2011) argues that social networks and norms influence individuals by disapproving high-risk behaviours and approving safe alternatives.

Some researchers report that an individual's sexual partner(s) and friends may significantly impact the recognition and labeling of one's behaviour as high risk; this is a labeling process (Catania *et al*., 1990; FHI360, 2020). In addition, the labeling process may be influenced by subsequent relabeling of high risk behaviours as being low risk or use of other cognitive coping strategies such as denial and avoidance (Catania *et al*., 1990). A study revealed that social networks and norms may have prevented the use of safer alternatives among students as some of them find buying condoms embarrassing and are influenced to have sex by peer pressure (Durojaiye, 2011).

Stage 2: Making a commitment to behaviour change / Making a commitment to reduce high-risk sexual contacts and to increase low-risk activities

Generally, stage two of ARRM reflects the decision-making approach which is the next step in the process of changing high-risk behaviours which involve reaching a firm decision to make behavioural changes and strongly committing to that decision (Catania *et al*., 1990). In addition, this decision-making process may include the alternative outcomes of remaining undecided, waiting for the problem to rectify itself or resigning one's self to the problem situation (Catania *et al*., 1990; FHI360, 2020).

Durojaiye (2011) notes that individuals make a commitment to change their sexual behaviours and practices through a series of actions by comparing the perceived cost and benefits. For instance, enjoyment (e.g., will the changes affect my enjoyment of sex?), response efficacy (e.g., will the changes successfully reduce my risk of HIV infection?), self-efficacy, knowledge of the health utility and enjoying a sexual practice as well as social factors (group norms and social support) are hypothesised as influences to commit to behaviour change (FHI360, 2020).

Durojaiye (2011) argues that the success in reducing the risk of an infection and the belief in an individual's ability to execute the actions are crucial in making commitment to change sexual practices. Even in other disciplines, it is observed that the ability to influence behaviour is central

to many of the key policy challenges in areas such as health, finance and climate change (Dolan *et al*., 2012). Dolan *et al*. (2012) found that the usual route to behaviour change in economics and psychology has been to attempt to 'change minds' by influencing the way people think through information and incentives.

Durojaiye (2011) found that most of the sexually active students had had sex for fun and enjoyment and some believed that sex was more enjoyable without a condom. In addition, some of them did not believe in their ability to use condoms as they felt it was their partners' responsibility, meaning that the students had not moved from stage one to make commitments to increase low-risk activities and reduce high-risk sexual contacts (Durojaiye, 2011).

Stage 3: Taking action

The third stage is broken down into three phases. In the phase one is information seeking; phase two is obtaining remedies; and phase three is enacting solutions and depending on an individual, however, phases may occur concurrently or may be skipped (FHI360, 2020). This is confirmed by other researchers that actions are taken to change behaviours through three phases: information seeking, finding solutions and enacting the solutions. These phases may take place at the same time or a phase omitted (see Durojaiye, 2011).

Durojaiye (2011) notes that the third stage of the AIDS Risk Reduction Model (ARRM) may be influenced by self-help, informal and formal help. For instance, in a study, students were actively provided with the information, solutions and ways to enact solutions in order to change sexual behaviours as regards HIV/AIDS control (Durojaiye, 2011). Durojaiye (2011) informed that virtually all the students had heard of HIV/AIDS and were knowledgeable of ways to prevent transmission. Generally, it is argued that some stage three actions may have taken place without having moved through the first and second stages of the ARRM probably as a result of positive attitudes toward HIV/AIDS prevention programmes (Durojaiye, 2011).

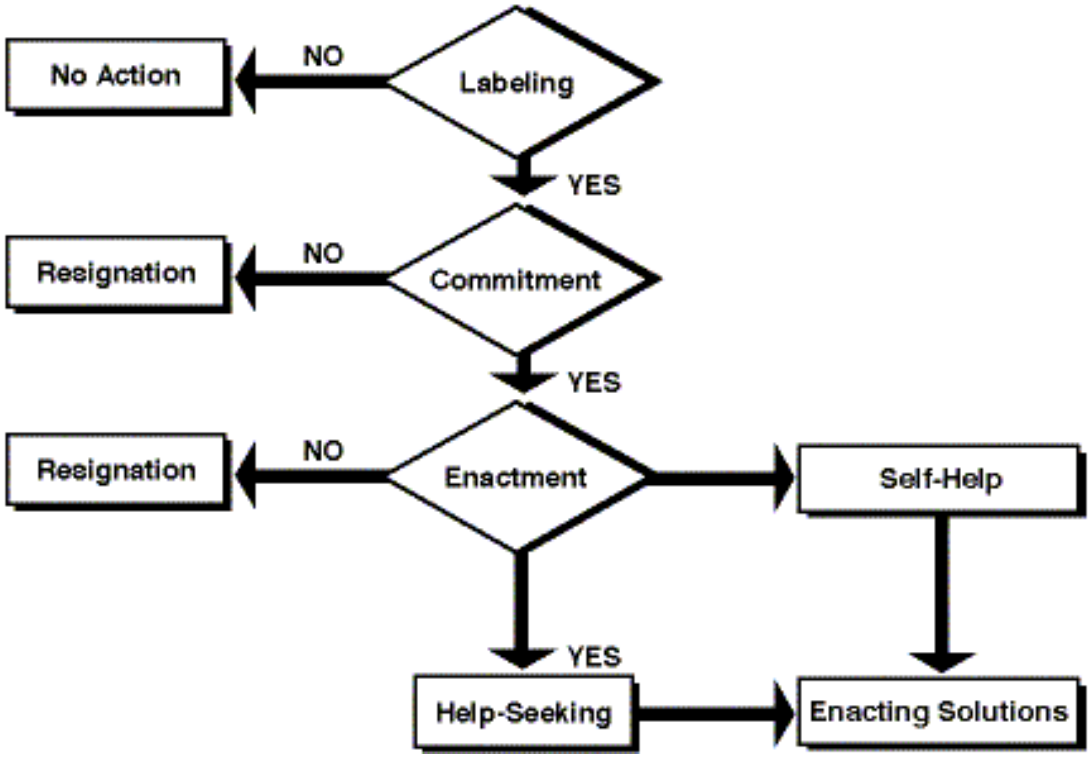
In addition, the ARRM combines aspects of the health belief model, dispersion of innovation theory and social cognitive theory (Mimiaga *et al*., 2009). Mimiaga *et al*. (2009) explained that

interventions using this model focus on conducting an individual risk assessment, influencing the decision to reduce risk through perceptions of enjoyment or self-efficacy and assisting the individual with support to enact the change.

It is anticipated that development of appropriate prevention programmes could represent a significant challenge to social and public health scientists. Studies report that changing high risk behaviours is the only means of preventing transmission of Human Immunodeficiency Virus (HIV) (Chin *et al*., 2012). Coates, Richter and Caceres (2008) argue that the aggregate effect of radical and sustained behavioural changes in a sufficient number of individuals potentially at risk of HIV infection is needed for successful reductions in HIV transmission. These analyses note that these could include what they called combination prevention which is essential as HIV prevention is neither simple nor can be simplified.

Generally, the ARRM emphasises the goal of understanding why people fail to progress over the change process and it is the focus of several studies (Catania *et al*., 1990). Other studies reveal that the ARRM is effective for understanding the factors that influence prevention or avoidance of HIV/AIDS risk (Lanier & Gates, 1996). Lanier and Gates (1996) suggested that previous life experiences should be formally integrated into the model. It is recommended that using the ARRM as a framework would provide valuable information that would help in developing appropriate interventions to effectively encourage positive sexual practices (Durojaiye, 2011).

Figure 2.2: AIDS Risk Reduction Model (ARRM)



(Catania, Kegeles, & Coates, 1990).

2.1.3. Stages of Change Theory (SCM)

The Stages of Change Model (SCM) was developed as a framework to describe the five phases through which an individual progresses during a health-related behaviour change (Prochaska & DiClemente, 1983). Shaffer (2013) argues that the stages of change model is part of the broader Transtheoretical Model (TTM) which not only assesses an individual's willingness to act to eliminate a behaviour but also includes strategies and processes of change that guide the individual through the stages. Some researchers explain that the stages of change model was initially used to change smoking or alcohol addiction behaviours but has been diversified to improve various nutritional and health-related behaviours (Prochaska & DiClemente, 1983; Kim *et al*., 2012).

Generally, the rationale for "staging" individuals was to tailor a therapy to an individual's needs at a particular point in the change process (FHI360, 2020). Other researchers note that the stages

of change model originated in research and was related to psychotherapy and the cessation of addictive behaviours such as smoking, alcohol and substance abuse and issues related to weight management (Buxton, Wyse, & Mercer, 1996; Shaffer, 2013). The stages of change model has been found to be an effective aid in understanding how people go through a change in behaviour (Prochaska, Redding & Evers, 2015).

The stages of change theory originally had four components which were identified and presented as a linear process of change namely; precontemplation, contemplation, preparation for action and maintenance (Prochaska & DiClemente, 1983; FHI360, 2020). In addition, a fifth stage which is preparation for action was incorporated into the theory as well as ten processes that help predict and motivate individual movement across the stages (Prochaska, DiClemente & Norcross, 1993; FHI360, 2020). The stages of change and processes theory have been explained below.

Precontemplation

Generally, the precontemplation stage means that an individual has the problem; whether he/she recognises it or not and has no intention of changing (Prochaska *et al*., 1993; FHI360, 2020). Kim *et al*. (2012) argue that the precontemplation stage involves a process where an individual has either very little knowledge or is not aware of the subject matter and has no intention to take actions to change the current lifestyle. Some researchers argue that achieving lifestyle behaviour change is particularly difficult for 'non-clinical' individuals who have not been diagnosed with a specific illness or experienced a motivating life event (Lacey & Street, 2017). Hence, this group of 'precontemplators' lack the understanding of the consequences of their behaviour, self-efficacy or motivation to change. They will be the least likely to volunteer to participate in an obesity prevention intervention (Lacey & Street, 2017).

Chee Yen and colleagues report that individuals in precontemplation stage had perceived barriers that outweigh perceived benefits and low self-efficacy as compared to individuals in other stages (see Chee Yen, Mohd Shariff, Kandiah & Mohd Taib, 2014).

Contemplation

Kim *et al*. (2012) observe that in the contemplation stage, an individual is supposed to be aware of the current lifestyle and that individual's plan to take action over the next six months. Some researchers argue that during the contemplation stage, individuals are aware of the consequences of their behaviour and are open to change (Lacey & Street, 2017).

Preparation for action

During the preparation for action stage, an individual is expected to recognise the problem and intend to change the behaviour within the next month (Prochaska *et al*., 1993). In addition, some behaviour change efforts may be reported such as inconsistent condom usage. However, at this stage, it is expected that the defined behaviour change criterion has not yet been reached, for instance, consistent condom usage (Prochaska *et al*., 1993; FHI360, 2020). Lacey and Street (2017) argue that individuals in this stage of change show anticipation and willingness to change within the next six months.

This third stage of the stages of change model could be used in conjunction with other constructs such as self-efficacy, perceived benefits and perceived barriers (see Greene *et al*., 2004; Chee Yen *et al*., 2014). For instance, a study determined stages of change in increasing fruit and vegetable intake and its relationship with self-efficacy, perceived benefits and perceived barriers. It was reported that perceived benefits tended to outweigh perceived barriers prior to taking an action (Chee Yen *et al*., 2014). Hence, it is assumed that individuals will take an action when they rate the benefits of eating more fruits and vegetables (i.e. health benefits, social influence) as more important than the barriers (i.e. safety, satiety and storage of fruits and vegetables) (Chee *Yen et al*., 2014).

Action

Some researchers note that the action stage includes people who are currently taking an action in the particular area of concern (Kim *et al*., 2012). The idea is that individuals in this stage have enacted consistent behaviour change such as consistent condom use for less than six months (Prochaska *et al*., 1993; FHI360, 2020).

Maintenance

Lacey and Street (2017) note that individuals at the maintenance stage would have sustained the new behaviour for more than six months and would be showing perseverance in maintaining the change or new behaviour. Moreover, in some versions of the stages of change model, the sixth stage could include the termination stage and this refers to the cessation of an unhealthy behaviour with no temptation to relapse (Lacey & Street, 2017).

Shaffer (2013) notes that the stages of change model was initially hypothesised that individuals progress linearly through a series of distinct stages of change. However, some researchers observe that this is not usually the case since a change process could take a cyclical or "spiral" pattern which may represent how most people change unhealthy behaviours over time (Whitelaw, Baldwin, Bunton, & Flynn, 2000; Shaffer, 2013). This is supported by other observations including the fact that the vision of behaviour change as a cyclical 'staged' process has stuck and that most of the literature associated with the model portrays it as being effective (Whitelaw *et al*., 2000). In addition, other evidences confirm that the stages are no longer considered to be linear. Rather, they are components of a cyclical process that varies for each individual (FHI360, 2020).

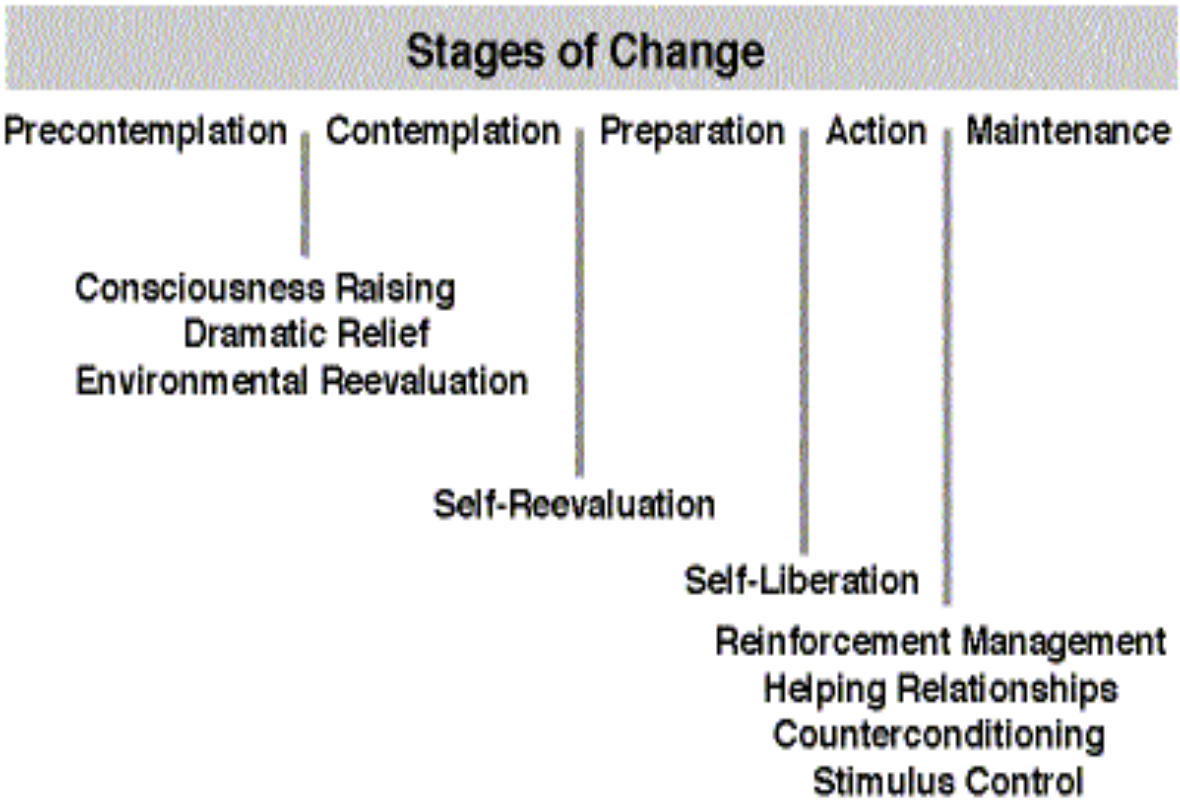
Generally, the stages of change model (Transtheoretical model) is more focused on decisional balance and self-efficacy in predicting behaviour change (Kim *et al*., 2012). A major benefit of the stages of change model is its potential concision of assessment, making it attractive to health practitioners as compared with other models of behaviour change such as the Health Belief Model and Theory of Planned Behaviours that typically require assessment of many variables for the purpose of categorisation (Rosenstock, 1974; Ajzen, 1991; Lacey & Street, 2017). In addition, the stages of change model have become a prominent feature within the field of health promotion (Sharma, 2016).

In general, the stages of change model assesses change as a temporary dimension occurring over time rather than a singular event, for example, a temporary change in an individual's transition between smoking and non-smoking behaviours (Michie, 2008; Lacey & Street, 2017). Michie

(2008) recommends that when assessing behaviours, it is important to consider the process of preparing to change over time as well as the behaviour itself (Michie, 2008; Lacey & Street, 2017).

Nonetheless, some researchers highlight some ethical difficulties associated with stages of change interventions and these include the potential for the model to exclude precontemplative individuals from interventions and the potential for the model to act as a subtle form of coercive control (see Whitelaw *et al*., 2000). Whitelaw and colleagues argue that the model may be particularly useful when it is used sensitively, flexibly and guardedly in association with a range of other theoretical resources (Whitelaw *et al*., 2000; Lacey & Street, 2017). Abramsky (2012) reports that the stages of change model has led to the development of community level HIV intervention that has been shown to reduce behaviours that put people at greater risk for HIV (Abramsky, 2012).

Figure 2.3: Stages of Change



(Prochaska, DiClemente, & Norcross, 1993).

2.1.4. Theory of Reasoned Action (TRA)

Generally, the Theory of Reasoned Action (TRA) and its extension, the Theory of Planned Behaviour (TPB), are cognitive theories that offer a conceptual framework for understanding human behaviour in a specific context (Ajzen & Fishbein, 1980; Ajzen, 1991; LaCaille, 2013). Some researchers argue that the TRA suggests that an individual's behaviour is determined by their intention to perform that behaviour and this intention is a function of their attitude towards the behaviour and subjective norms (Fishbein & Ajzen, 1980; Silverman, Hanrahan, Huang, Rabinowitz & Lim, 2016). Hammond and Niedermann (2010) note that the TRA and TPB consider intention and perceived control as other important determinants for health behaviour.

Generally, the central construct of the theory of reasoned action is intention which is a motivational construct that is considered the most proximal determinant of behaviour (Hagger, 2019). Hagger (2019) observes that intention reflects the extent to which an individual is likely to plan to do and invest effort in pursuing a given behaviour. Hence, an intention to engage in a certain behaviour is considered the best predictor of whether or not an individual will actually engage in that behaviour (LaCaille, 2013). Silverman and colleagues explain that the best predictor of behaviour is intention and that is the belief that behaviour will lead to the intended outcome. Moreover, these researchers inform that intention is determined by three things: attitude towards the specific behaviour, the subjective norms and the perceived behavioural control (Silverman *et al*., 2016).

Hagger (2019) argues that intention is conceptualised as a function of two belief-based constructs: attitudes and subjective norms. This is explained to mean that attitudes are positive or negative evaluations of performing a behaviour in the future while subjective norms also reflect the beliefs that significant others (other interest groups) would want them to perform the said behaviour. Supporting this argument, other researchers contend that an intention towards a behaviour is shaped by an individual's attitudes and subjective norms such as expectations from the social environment which could act as pros and cons towards a particular behaviour (Hammond & Niedermann, 2010). For instance, another study confirms this point that the more positively a person regards a particular behaviour or action and the more they perceive the behaviour as being

important to their friends, family or society, the more likely they are to form intentions to engage in the said behaviour (LaCaille, 2013).

In addition, it is expected that if people evaluate a suggested behaviour as positive (attitude) and if they think others want them to perform the behaviour (subjective norm), this could result in a higher intention (motivation) and they are more likely to perform the suggested behaviour (Mimiaga *et al.*, 2009). Other researchers report that the more favourable the attitude and subjective norms and the greater the perceived control, the stronger the person's intention to perform the behaviour (Silverman *et al*., 2016). Hammond and Niedermann (2010) note that perceived control emerged from research on locus of control and perceived self-efficacy and it was assumed that intention and perceived control interact (Hammond & Niedermann, 2010).

Hagger (2019) contends that the theory of reasoned action (TRA) demonstrated effectiveness in predicting variability in people's behaviour across many contexts, populations and behaviours. Supporting its success, a researcher argued that in general terms, the TRA is most successful when it is applied to behaviours that are under an individual's voluntary control (Shaw, 2016). Shaw (2016) continued that if behaviours are not fully under voluntary control, even though individuals may be highly motivated by their own attitudes and subjective norms, they may not actually perform the behaviour due to intervening environmental conditions.

Showing the relationship between the theory of reasoned action and theory of planned behaviour, some researchers explain that the theory of planned Behaviour (TPB) was an attempt to extend the theory of reasoned action (TRA) to include other behaviours such as giving up smoking or using a condom that are not under the complete control of an individual (Sutton, 2001; Hagger, 2019).

Generally, the theory of reasoned action (TRA) has emerged as the dominant conceptual framework for predicting, explaining and changing human social behaviour and the most popular model in this tradition, the theory of planned behaviour, has generated a great deal of empirical research supporting the premises of this approach (Ajzen, 2012). Ajzen (2012) supports this by

noting that researchers have been able to design effective behaviour change interventions based on the TRA.

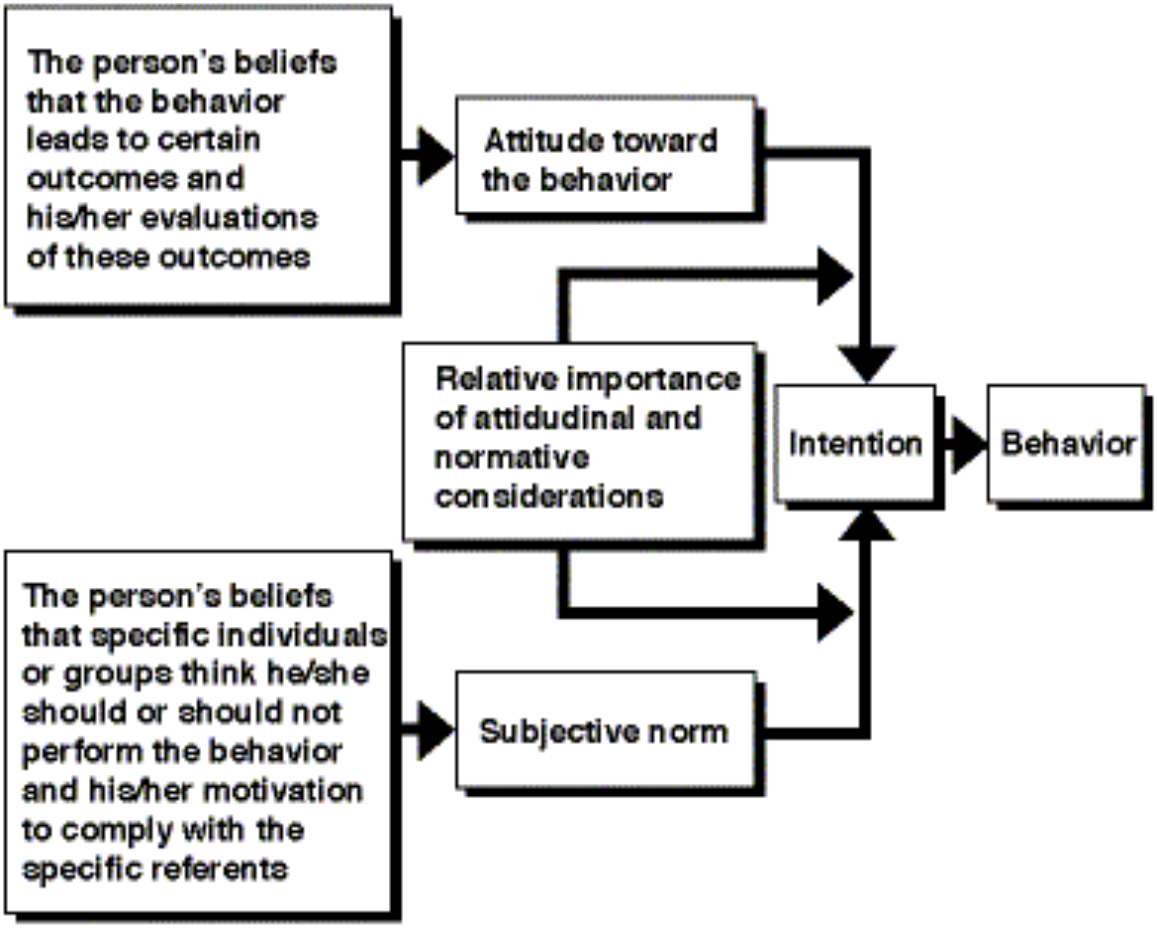
Hagger (2019) argues in favour of this success story by suggestion that the TRA and TPB are popular due to their relative simplicity and flexibility as well as their effectiveness in accounting for substantive variance in behaviour. In addition, the theories have also served as the basis for extended theories that encompass new constructs towards developing more comprehensive explanations of behaviour and to test salient processes that determine action such as the relationship between intentions and behaviour (Hagger, 2019). Furthermore, it has provided a theoretical framework for health studies including slimming and eating behaviour, addiction to smoking and alcohol abuse and condom use and HIV (see Taylor *et al*., 2007; Nguyen, 2018).

However, the result of some studies with regards to the limitation of the TRA was that behavioural intention does not always lead to actual behaviour (see Sniehotta, Presseau & Araújo-Soares, 2014). A counter-argument against the strong relationship between behavioural intention and actual behaviour led to the evolution of the theory of planned behaviour; a model which includes the impact of non-volitional factors on behaviour (Mimiaga *et al*., 2009). Other criticisms against this theory relate to its exclusive focus on rational reasoning, excluding unconscious influences on behaviour (Sheeran, Gollwitzer & Bargh, 2013) and the role of emotions beyond anticipated affective outcomes (Conner, Gaston, Sheeran & Germain, 2013).

Some researchers explain that the Theory of Reasoned Actions (TRA) fails to consider the role of environmental and structural issues and this is because of its individualistic approach as well as the linearity of the theory components (Kippax & Crawford, 1993; FHI360). Furthermore, an important constraint is the 'intention–behaviour gap' in which a major change in intention only leads to a limited change in behaviour. This shows that behaviour is not only driven by intentions (Hall & Fong, 2007; Nguyen, 2018). For instance, a growing body of research shows that previous behaviour is a significant predictor of intentions (Sommer, 2011; Nguyen, 2018).

Generally, in view of the above discussions, it could be argued that progress is being made in broadening behaviour change theories and models. Nonetheless, much work remains to be done (Kaufman *et al*., 2014). Much will be gained in improving HIV prevention and care if more comprehensive models of behaviour change could be considered (Kaufman *et al*., 2014).

Figure 2.4: Theory of Reasoned Action (TRA)



(Fishbein, 1980).

2.1.5. Justification for the choice of the AIDS Risk Reduction Model (ARRM)

After assessing all the four most commonly used models in HIV/AIDS studies, it was considered that the AIDS Risk Reduction Model (ARRM) was relevant to this current study. Thus, it was the basis upon which the conceptual framework of the study was developed.

This theory was deemed applicable because the purpose of the study was to examine the personal perceptions of HIV infection among female prisoners in Ghana. This was due to the proposition by the ARRM that it is a conceptual model designed to explain the influence of knowledge and attitudes towards HIV/AIDS on risk-related behaviours (Lanier & Gates, 1996; FHI360).

Similarly, the idea for the choice of this model was that since knowledge of HIV may influence HIV related-risk behaviours, responses by female prisoners in this study were expected to be informed largely by how they would appraise their personal HIV risk. Given that the first stage of ARRM is to recognize and label an individual's behaviour as high risk and it being influenced by knowledge of HIV transmission methods, it was expected that female prisoners would be able to admit that they were susceptible to HIV/AIDS and that having HIV/AIDS was undesirable as documented in the literature (Durojaiye, 2011).

In addition, the choice of the model was suitable since the assumption was that female prisoners' personal HIV risk appraisal could also vary based on their sociodemographic characteristics such as age, level of education, religion and country of residence as well as type of prison sentence and duration of stay in prison. This argument has been made in earlier studies (see Rosen *et al*., 2009). Rosen *et al*. (2009), using a similar basis, found that the strongest risk factors for HIV infection among inmates in the North Carolina Prison system included those aged 35 years to 44 years.

In general terms, stage two of ARRM reflects the decision-making approach which is the next step in the process of changing high risk behaviours and this involves reaching a firm decision to make behavioural changes and strongly committing to that decision (Catania *et al*., 1990). Therefore, it was expected that female prisoners would make a commitment to change their HIV-related risk behaviours and practices through a series of actions by comparing the perceived costs and benefits (see Kacanek *et al*., 2007).

Furthermore, the need to apply ARRM was muted by the opinion that after female prisoners have accurately appraised their personal HIV risk perception, they would take the appropriate actions to reduce contracting HIV in prison. Nonetheless, it was obvious that the 3rd stage of the AIDS Risk Reduction Model (ARRM) might be influenced by self-help, informal and formal help because of the presence of prison officers and security regulations (Mimiaga *et al*., 2009). Mimiaga *et al*. (2009) explained that interventions using this model focus on conducting an individual risk assessment, influencing the decision to reduce risk through perceptions of enjoyment or self-efficacy and assisting the individual with support to enact the change.

In addition, the use of this model was motivated by the fact that comprehensive knowledge of HIV transmission and prevention would likely lead to accurate appraisal of personal HIV risk in prison by female prisoners in Ghana. It was expected that the effects of HIV misconceptions could be overcome through provision of HIV education by trained health professionals in prisons which could also lead to appropriate appraisal of personal HIV risk by the prisoners while in prison (see Arora, Thornton, Jenkusky, Parish & Scaletti, 2007).

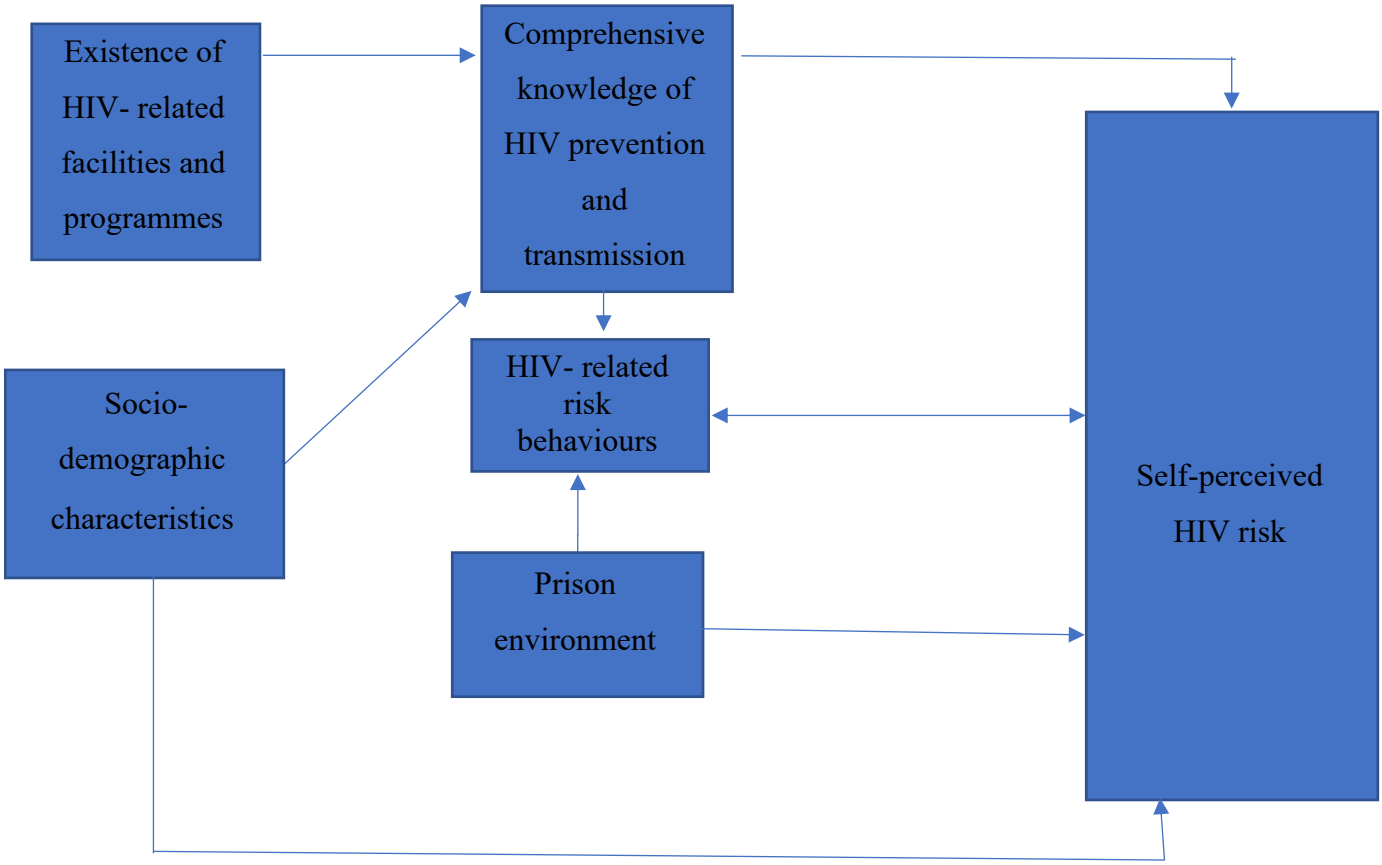
The choice of the ARRM was based on the acknowledgement by the construct of the model (ARRM) that the prison environment, other prisoners and prison officers play a significant role with regards to HIV-related risk behaviours in prison, emphasising that these social networks and norms could influence individual prisoners to disapprove of high-risk behaviours and approve of safe alternatives (see Durojaiye, 2011).

The decision to adopt the AIDS Risk Reduction Model (ARRM) in the conduct of this study was based on the need to examine the personal risk perception of HIV infection among female prisoners in Ghana so as to establish the factors that could influence such perceptions. Hence, the study was interested in assessing comprehensive knowledge of HIV transmission and prevention, HIV-related risk behaviours and availability of HIV-related facilities in prison. This was facilitated by collecting the perceptions of prisoners on these factors using a structured questionnaire, after which data collected was analysed to arrive at the results.

2.2. Conceptual framework for HIV risk perception among female prisoners

Based on the theoretical analysis and literature review, the conceptual framework in figure 2.5 was designed. That is to say that this conceptual framework was developed for this study based on findings from previous research to explain the impact of independent variables such as socio-demographics, comprehensive knowledge of HIV transmission and prevention, HIV-related risk behaviours, prison environment and HIV-related health facilities on personal risk perception of HIV infection as the dependent variable. This conceptual framework shows that in assessing the HIV risk perception among female prisoners in the context of Ghana, there is the need to show the interrelationship between these variables as enumerated. This framework was used to develop the questionnaire used for this study as shown in Appendix B. Generally, the significance of this conceptual framework was assessed through the collection of empirical information.

Figure 2.5: Conceptual framework for HIV risk perception among female prisoners



2.3. Chapter summary

This chapter aimed to assess the theoretical and public health importance of the study. This was achieved by examining the four key models that could lead to behaviour change in the HIV/AIDS literature. Through this analysis, it was seen that there were four main models: Health Belief Model (HBM), Stages of Change Model (SCM), AIDS Risk Reduction Model (ARRM) and Theory of Reasoned Action (TRA). On the basis of their benefits and criticisms, it was deemed appropriate to adopt the ARRM to frame the conceptual framework of this study. In the next chapter, the materials and methods including the research design, data collection methods and approaches to data analysis have been presented.

CHAPTER THREE

RESEARCH MATERIALS AND METHODS

3.0. Introduction

This chapter outlines the research objectives and questions of this study. Additionally, this chapter presents the epistemological considerations, including the research design and methodology for this study. The chapter then describes the strategies adopted in collecting empirical data, the study area and study population and preparation for field research. The analytic strategy and how the findings have been presented, interpreted and explained are then laid out. Finally, an outline of the research process from the beginning to the end is presented. The chapter is divided into sections.

3.1. Objectives of the study

The objectives of the study were grouped into general and specific as outlined below.

3.1.1. General Objective

The general objective of the study was to examine the personal risk perception for HIV infection among female prisoners in Ghana.

3.1.2. Specific objectives

The following specific objectives were to help address the general objectives:

1. To assess the level of comprehensive knowledge of HIV/AIDS transmission and prevention among female prisoners in Ghana.
2. To identify the correlates of personal HIV-risk perception among female prisoners in Ghana.
3. To examine HIV-related risk behaviours among female prisoners in Ghana.
4. To examine the correlates of HIV risky behaviour among female prisoners in Ghana.
5. To assess the availability of HIV-related facilities in female prisons in Ghana.

3.2. General research question

The general research question that helped to find answers to address the general objective was, "To what extent do female prisoners in Ghana perceive themselves to be at risk for HIV infection?"

3.2.1. Specific research questions

The following specific questions assisted in finding answers to respond to the specific objectives:

1. What is the level of comprehensive knowledge of HIV prevention and transmission among female prisoners in Ghana?
2. What are the correlates of personal HIV-risk perception among female prisoners in Ghana?
3. To what extent do female prisoners in Ghana engage in HIV-related risk behaviours?
4. What are the correlates of HIV risky behaviour among female prisoners in Ghana?
5. What are the available HIV-related facilities in female prisons in Ghana?

3.3. Philosophical assumption

This section presents positivism as the philosophical assumption underlying the choice of the research methodology for the study. The other paradigms are interpretivism/constructionism and post-positivisms/postmodernism (Johnson & Duberley, 2011). This is necessary to inform the assessor on the perspective from which the study was conducted. Arguably, some analysts contend that there is diversity among the schools of thought which has come about as a result of competition (Johnson et al., 2003; Goduka, 2012). Therefore, quantitative research involves measurement and assumes that the phenomenon under study can be measured (Goduka, 2012).

Quantitative research sets out to gather data using measurement, analyse this data for trends and relationships and verify the measurements made; a thought which has come about as a result of competition (Johnson et al., 2003; Goduka, 2012). Debatably, analysts suggest that it is unwise to conduct research without an awareness of the philosophical and political issues that lie in the background (Easterby-Smith et al., 2002; Bahari, 2010). These assumptions have been presented below.

Positivism

The positivism assumption is a research paradigm that is very well known and well-established in universities worldwide because scientific research paradigm strives to investigate, confirm and predict law-like patterns of behaviour and is commonly used in graduate research to test theories or hypotheses (Taylor, & Medina, 2011).

Goduka (2012) argues that research approaches and procedures in social science were rooted in the positivist paradigm which is concerned with investigating phenomena that are de-contextualised, observable and measured using objective methods within the quantitative approach. The position of some analysts is that positivism assumes that there are social facts with an objective reality apart from the beliefs of individuals (Bahari, 2010). For this reason, other researchers posit that knowledge is only of significance if it is based on observations of this external reality (Easterby-Smith et al., 2002; Bahari, 2010).

Bahari (2010) argues that the main ideas of positivists can be regarded, as the social world exists externally, since the positivists' approach to research is that the research is undertaken as far as possible, in a value-free way. However, Goduka (2012) draws attention to the reality that this can restrict the possibility of gaining knowledge of what can be known using other research world views, paradigms and approaches that include constructivist and qualitative approach, participatory research paradigm and indigenous-based scientific methods.

The support from other researchers on the need for positivists' position is that positivist researchers believe that there is a clear-cut relationship between things and events in the outside world and people's knowledge of them (Staiton-Rogers, 2006; Bahari, 2010). Nonetheless, the counter-argument is that knowledge through the positivist paradigm is, therefore, none other than the result of Western-based science that is associated with its ontological, epistemological, axiological, methodological and rhetorical assumptions (Goduka, 2012).

To provide the reader with some level of insight into the other paradigms, the interpretivism, constructionist and post-positivists paradigms have been explained below.

Interpretivism/Constructionism

Theoretically, it is believed that interpretive paradigm allows researchers to view the world from the perceptions and experiences of the participants (Thanh, & Thanh, 2015). It is argued that subjectivism is normally related with the term constructionism or social constructionism (Saunders et al., 2007; Goduka, 2012). Indicatively, other analysts suggest that the new paradigm, which has been developed by philosophers during the last half century, largely in reaction to the application of positivism to the social sciences, stems from the view that 'reality' is not objective and exterior but is socially constructed and given meaning by people (Easterby-Smith et al., 2002; Goduka, 2012).

Goduka (2012) argues that the focus of constructivist researchers mainly is on what people think and feel, how they communicate with each other (verbal or non-verbal) and attempts to understand and explain why people have different experiences. Thus, the central view of constructionism is that the researcher's role is to appreciate/interpret the different constructions and meanings based on people's experience (David & Sutton, 2004; Goduka, 2012).

Post-positivism / Postmodernism

The idea of post-positivistic approaches is that they offer the opportunity to examine the phenomenon by placing emphasis on a range of its dimensions and the interplays between dimensions (Karatas-Ozkan, Anderson, Fayolle, Howells & Condor, 2014). Another point of post-positivism is that it is a milder form of positivism that follows the same principles but allows more interaction between the researcher and his/her research participants (Taylor, & Medina, 2011). Additionally, it is argued that post-positivists use additional methods such as survey research and qualitative methods such as interviewing and participant observation (Willis, 2007; Creswell, 2008; Taylor & Medina, 2011).

Taylor and Medina (2011) explain that the post-positivist paradigm is the modified scientific method for the social sciences which aims to produce objective and generalisable knowledge of social patterns, seeking to affirm the presence of universal properties/laws in relationships among pre-defined variables.

Justification for the choice of philosophical assumption

As indicated earlier, the researcher's philosophical assumption was based on the positivist paradigm. This choice was based on a consideration of several factors. Firstly, this paradigm was suitable for this study since it assisted in achieving the overall objective which was to assess the perceptions of personal risk of HIV infection among female prisoners in Ghana. The idea of conducting a study among female incarcerated people was a sensitive one. However, the choice of the positivists' paradigm and associated quantitative research method helped the participants to freely answer pre-determined questions with answers without providing further explanation.

Therefore, using the interpretivist or post-positivist perspectives would have been considered as a bit intrusive of their private life and experiences. This position is further supported by the argument that the positivist paradigm mostly involves quantitative methodology, utilizing experimental methods involving experimental (or treatment) and control groups and administration of pre and post tests to measure gain scores (Taylor, & Medina, 2011). Against this background, the next section presents the epistemological considerations within which the argument for the choice of either quantitative or qualitative research methodology is made.

3.4. Epistemological considerations

In this section, the epistemological basis underlying the choice of research methodology for this study is discussed, its appropriateness for the research question is addressed and a justification for its selection is given. The section begins by addressing the epistemological approach and then elaborates on the research methodology. For a successful execution and completion of a research project, a researcher needs to clearly spell out the epistemological positions, research methodology and research design adopted (Della Porta & Keating, 2008; Moss, 2013).

Goertz and Mahoney (2012) indicated that the qualitative and quantitative traditions exhibit important epistemological differences in their beliefs about the quality of knowledge. Moss (2013) explains that epistemology is the study of knowledge.

Understanding the epistemological and ontological basis of a research is relevant to the choice of an appropriate methodology. For instance, some researchers posit that quantitative and qualitative scholars differ systematically and often dramatically in their approaches to concepts and measurement (Goertz, 2005; Goertz, & Mahoney, 2012). Crookes (2012) discusses that the central concepts related to 'knowledge of interest to philosophers, educators and scientists have been analysed using a small group of primary categories; the core three are metaphysics, epistemology and axiology'. Scotland (2012) observes the interrelationships between each paradigm's ontology, epistemology, methodology and methods.

This brings into sharp focus the two important differences between the quantitative and qualitative approaches to concepts and measurement (Goertz & Mahoney, 2012). Goertz and Mahoney (2012) reveal that the first concerns ontology which might seem like a strange rubric yet most concepts are intended to represent phenomena in the empirical world as they exist. Brannen (2005) clarifies this by informing that qualitative and quantitative researches are often presented as "two fundamentally different paradigms through which we study the social world" (p.173). This researcher notes that these paradigms act as lightning conductors to which sets of epistemological assumptions, theoretical approaches and methods are attracted as each is seen to be incompatible with the other (Brannen, 2005).

Goertz and Mahoney (2012) note that the second big difference concerns epistemology which in quantitative approach relates to the challenges of knowledge generation, which are closely linked to 'error', contending that the whole field of statistics is concerned with producing valid knowledge in a context in which error is present.

Della Porta and Keating (2008) explain that research methodology has to do with how various methods and instruments of social research are applied to a research project. Meretoja (2014) discusses the epistemological and ontological position on the significance of narrative for human existence. Della Porta and Keating (2008) continue that ultimately, the choice of research methodology and design is guided by overarching ontological, epistemological and theoretical considerations which are foundational to each discipline or subject of inquiry. Consequently, the

research methodology adopted was based on the epistemological and ontological framework of the positivists' assumption (Goduka, 2012).

3.5. Research methodology

It is argued that in social science and most interdisciplinary areas such as sociology, political science, psychology and public health, the broad theoretical and epistemological approaches are either positivistic or interpretative approaches (Della Porta & Keating, 2008). Invariably, the assumption is that there is a debate in the methodological fields involving quantitative and qualitative research (Hammersley, 2017). Corrigan (2013) also contends that the quantitative-qualitative debate in management and organizational studies has been of interest to scholars over the years. Choy (2014) explains that this has been the case because in planning and implementing a research, the need to choose either one research methodology (quantitative and qualitative) will still be associated with strengths and weaknesses for the research.

Hammersley (2017) even challenges the widely held idea that there are two methodological paradigms in social research: quantitative and qualitative. This researcher identifies seven of the various component meanings of the qualitative/quantitative distinction such as: qualitative versus quantitative data; the investigation of natural versus artificial settings; a focus on meanings rather than behaviour; adoption or rejection of natural science as a model; an inductive versus a deductive approach; the identification of cultural patterns as against seeking scientific laws; and idealism versus realism.

For the purposes of this study, it was imperative that the researcher showed the distinctions between the quantitative and qualitative research methodologies in order to position the choice of quantitative methodology in perspective. This is to clear the ambiguities surrounding the debate. For instance, it is opined that it is common for quantitative method to be criticised for taking natural science as its model; and it is also common for qualitative researchers to contrast their own inductive approach with the deductive or hypothetic-deductive method of quantitative research (Hammersley, 2017).

The other argument in support of the choice of research methodology is that the right choice of a suitable research methodology is a crucial decision to perform effective scientific research and is mainly based on linking research objectives to the characteristics of the available research methodologies. The quantitative research method is explained below.

Quantitative research methodology

Bryman (2017) argues that quantitative research is especially efficient at getting to the 'structural' features of social life. Some researchers note that quantitative methods characteristically refer to standardised questionnaires that are administered to individuals or households which are identified through various forms of sampling; usually random sampling (Dudwick, Kuehnast, Jones, & Woolcock, 2006; Choy, 2014).

Wang, Watts, Anderson and Little (2013) explain that quantitative research usually involves systematic and empirical investigation of phenomena through statistics and mathematics and the processing of numerical data. A similar observation is made that quantitative research involves a variety of methods which include the systematic investigation of social phenomena using statistical or numerical data (Watson, 2015). Wang et al. (2013) indicate that the process of estimating numbers in quantitative research provides the fundamental link between empirical observation and mathematical expression of quantitative relations. This view is supported by another analyst who points out that quantitative research involves measurement and assumes that the phenomenon under study can be measured and analysed for trends and relationships (Watson, 2015).

Watson (2015) argues that the principal research designs in quantitative research are experiments and surveys such as quantitative research can be used to formally test theories by formulating hypotheses and applying statistical analyses. Arguably, the statistics used in quantitative research is an important area of mathematics and is widely used when: (a) there is a need to analyse and process large volumes of quantitative data to verify hypotheses and to test a theory, (b) there is uncertainty related to theories under consideration, (c) research might be effectively carried out with questionnaires containing simple questions and short answers and (d) the data obtained can be quantified and compared (Wang et al., 2013). To show the distinction between quantitative and

qualitative research methodologies, it was important to explain the qualitative research methodology as presented below.

Qualitative research methodology

The evidence available shows that qualitative research is used in the exploration of meanings of social phenomena as experienced by individuals themselves in their natural context (Malterud, 2001; Grossoehme, 2014). Some researchers have noted that qualitative research is used to gain insight into people's feelings and thoughts which may affect the way they behave; and there is no generalisation of the findings to a wider population in qualitative research (Sutton, & Austin, 2015). It is argued that qualitative methods are applied to research questions that seek to explore why or how a phenomenon occurs, develop a theory or describe the nature of an individual's experience (Creswell, & Clark, 2011; Fetters, Curry & Creswell, 2013).

Savin-Baden and Howell-Major (2013) posit that qualitative researchers can conceptualise the five 'moments of choice' in the process of going about qualitative research, including choice of research paradigm (e.g. phenomenological, social constructionist, etc.), choice of research phenomenon (e.g. individuals, groups, concepts, etc.), selection of qualitative research approach (e.g. grounded theory, narrative, etc.), data collection approach (e.g. interview, observation, focus group, etc.) and analytic strategy (e.g. thematic analysis, content analysis, constant comparison, etc.).

It is explained that qualitative research is a technique which describes in words (rather than numbers) the qualities of social phenomena (Lincoln, 1992; Small & Mannion, 2005; Obermann, Scheppe & Glazinski, 2013). The usefulness of qualitative methodology include; first, qualitative studies could be useful for explorative studies before an economic model has even been specified; second, qualitative studies could be used as a precursor to quantitative analysis as a check on the internal validity of the study design; and third, qualitative studies could be conducted ex post to help with the interpretation of confusing or seemingly contradictory evidence in the quantitative analysis (Coast, 1999; Bowling, 2009; Obermann et al., 2013).

Qualitative methods could help design the attributes of which respondents choose to ensure that attributes reflect all concepts which are not only relevant to them but also not misleadingly worded (Coast et al., 2012; Obermann et al., 2013).

Mixed-methods research methodologies

Baker et al. (2006) suggest that mixed methods may be suitable to replace the standard quantitative analysis of discrete choice experiments altogether (Obermann et al., 2013). Smith et al. (2009) argue that health economists should employ qualitative research when translating economic analysis into organisational practice (Obermann et al., 2013).

Some researchers argue that mixed-methods researches are products of the pragmatist paradigm that combine the qualitative and quantitative approaches within different phases of the research process (Tashakkori, & Teddlie, 2008; Terrell, 2012; Obermann et al., 2013). Creswell and Creswell (2017) explain that the combination of quantitative and qualitative approaches in research has gained popularity and this is because research methodology continues to evolve and develop.

These researchers continue that mixed-methods research concentrates on the strengths of both quantitative and qualitative approaches and offers an innovative approach for addressing current issues in health services. The integration of quantitative and qualitative data can significantly improve mixed-methods research (Bryman, 2006; Creswell, & Clark, 2011; Fetters et al., 2013; Obermann et al., 2013).

The use of mixed-methods helps to provide an expanded understanding of research problems (Creswell, & Creswell, 2017). Balarabe (2012) argues that a combination of the two approaches, where necessary, would provide a vigorous, rich and reliable data for researching issues. Therefore, this analyst argues that a mixed-methods approach in research is not only welcomed but certainly timely.

Justification for the choice of quantitative research method

As indicated earlier, the study applied quantitative research method which is based on the idea that social phenomena can be quantified, measured and expressed numerically (Mohajan, 2018; Mamia, 2013; Galt, 2009). Some researchers explain that this is the information about a social

phenomenon expressed in numeric terms such that it can be analysed by statistical methods (Mohajan, 2018).

Additionally, the quantitative research method was applied since it is shown that observations in such a research can be directly numeric information or classified into numeric variables; observation is transformed into a data matrix in which each observation unit (e.g. individual) occupies one row and each variable, one column (Mohajan, 2018; Mamia, 2013; Galt, 2009).

Moreover, the quantitative research method was applied in this study since it provides an idea of inferential statistics; generalisation from sample to population (Mohajan, 2018; Mamia, 2013; Galt, 2009). Based on the exposition of the philosophical and epistemological background underlying the study, the appropriate research design and strategy applied to collect empirical data have been presented below.

3.6. Research design and strategy

This section presents analysis of the research design and strategy applied in the conduct of the study. It is explained that a study design is the way the entire study is organised from the initial stages of problem definition to the final stages, including data collection and analysis (Cresswell, 2007; Moss, 2013). Omair (2015) argues that the basic issues in deciding how to conduct a study is to first determine the appropriate epidemiological study design for achieving the stated aim and objectives of the proposed research question.

Other researchers also argue that the choice of research methodology and design at the research level should necessarily be guided by their appropriateness and relevance to the objectives to be achieved and research questions to be answered (Della Porta & Keating, 2008; Moss, 2013). Checkoway, Pearce and Kriebel (2007) explain that choosing the right study design is very important in any research study. Other researchers have also noted that the study design determines how the study will be conducted, especially the sampling and data analysis (Nelson, Williams &

Graham, 2008). Based on this notion, the type of study known as a cross-sectional design has been explained below.

Type of study

This study applied a cross–sectional design to gather data from all the seven female prison locations in Ghana. Levin (2006) explains that cross-sectional studies are carried out at a time or over a short period and it is usually conducted to estimate the prevalence of the outcome of interest for a given population, commonly for the purposes of public health planning. Another study suggests that in a cross-sectional study, the researcher measures the outcome and exposures in the study participants at the same time, meaning the participants in a cross-sectional study are just selected based on the inclusion and exclusion criteria set for the study (Setia, 2016).

This study design was applied to meet the aims and objectives of the study in addition to other factors. Firstly, it was applied since data can be collected on individual characteristics, including exposure to risk factors alongside information about the outcome (Levin, 2006). Additionally, this design was adopted as cross-sectional studies provide a 'snapshot' of the outcome and the characteristics associated with it at a specific point in time (Levin, 2006).

In addition, it was adopted because in a cross-sectional study design, once the participants have been selected, the investigator follows the study to assess the exposure and outcomes and may study their association (Setia, 2016). Furthermore, this study design was adopted as the cross-sectional study design is one of the commonest and most well-known study designs (Omair, 2015).

Moreover, this approach was applied because it offered the researcher the opportunity to study the entire population and from these individuals, data was collected to help answer research questions of interest (Omair (2015). This allowed for the information gathered to represent what was going on at only one point in time (Omair, 2015; Olsen & St. George, 2004).

3.6.1. Study area

This section presents the basic information about the study sites in Ghana. A brief background to Ghana, a country located in the western part of Africa where the study was conducted, has been provided before the description of the study sites (Ghana Statistical Service (GSS), 2013).

Geography and demography

A World Population Review (2020) report shows that Ghana's land mass is almost the same as United Kingdom's (92,099 square miles/238,535 square kilometers), giving the country an overall population density of 313 people per square mile or 121 people per square kilometer. Currently, there are sixteen regions namely; Ahafo Region, Ashanti Region, Bono Region, Bono East Region, Central Region, Eastern Region, Greater Accra Region, Northern Region, North East Region, Oti Region, Savannah Region, Upper East Region, Upper West Region, Volta Region, Western Region and Western North (Ghana Statistical Service (GSS), 2013). These regions constitute the first level of subnational government administration within the Republic of Ghana. Its western border is delineated by Ivory Coast while to its north lies Burkina Faso. East of Ghana lies Togo while the south is bordered by the Atlantic and Gulf of Guinea. Ghana's population is concentrated along the coast and in the principal cities of Accra and Kumasi.

Statistics shows that the resident population of Ghana was 24,658,823 constituting 12,024,845 males (48.8%) and 12,633,978 females as of 2010 (Ghana Statistical Service (GSS), 2013). The current population of Ghana is estimated to be 31.07 million, up from the official 2010 census (World Population Review (WPR), 2020).

Political and governance framework

Ghana was the first place in Sub-Saharan Africa where Europeans arrived to trade. It was formerly known as the Gold Coast; attained independence on 6th March 1957 and became a Republic on 1st July 1960 (United Nations Development Programme (UNDP), 2020). Ghana has made tremendous efforts to provide relevant legislation and institutional arrangements have been improved to promote inclusive society. A United Nations Development Programmeme (UNDP) (2020) report

observes that the Government of Ghana has enacted several laws and implemented the National Social Protection Strategy.

Economic activities

Ghana is the world's second largest cocoa producer behind Ivory Coast and Africa's biggest gold miner after South Africa (United Nations Development Programmeme (UNDP), 2020). Ghana is one of the continent's fastest growing economies and has made major progress in the attainment and consolidation of growth. Ghana has made significant progress in poverty reduction and became the first country in Sub-Saharan Africa to achieve the Millennium Development Goal (MDG) 1 which is the target of halving extreme poverty (United Nations Development Programmeme (UNDP), 2020). Thus, Ghana has recently become a middle-income country because the economy has proved to be relatively resilient because of the high prices of cocoa and gold with real progress in good governance, youth and gender empowerment (United Nations Development Programmeme (UNDP), 2020).

Healthcare provision

Ghana's healthcare system is built on a pluralistic principle involving the government (public), private and community health sectors where administratively, the Ghana Health Service (GHS), as the service delivery arm of the health sector, is organised at three (3) levels: national level, regional level and district level (Ghana Health Service (GHS), 2020). A Ghana Health Service (2020) document indicates that the administrative levels are organised as Budget and Management Centres (BMCs) or Cost Centres for purposes of administering Government of Ghana and Developmental Partner Funds. There are a total of 223 functional BMCs and 110 sub-districts BMCs on record (Ghana Health Service (GHS), 2020).

The evidence available is that Ghana's established health transition encompasses epidemiological, demographic and nutrition transitions (Aikins, & Koram, 2017). Aikins and Koram (2017) reported that the epidemiological transition of Ghana is characterised by a double burden of infectious and chronic non-communicable diseases, the demographic transition by low fertility,

ageing, urbanisation and increased wealth and the nutrition transition by a co-existence of over and under nutrition.

The other evidence is that Ghana's healthcare expenditure has increased over the past two decades (Adua, Frimpong, Li & Wang, 2017). Adua *et al.* (2017) argue that increased healthcare expenditures are required to enhance the acquisition of better hospital resources that may improve healthcare. These researchers contend that infant and under-5 mortalities have declined by 50% and 25% respectively as of 2014 while life expectancy has increased from 60.7 years to 64.8 years (Adua *et al.*, 2017).

Other arguments are that the transitions in Ghana are uniquely patterned across age, gender, socio-economic status and residence and have had an impact on individual lifestyles, family, social and health systems. Additionally, Ghana's healthcare performance is modeled on the World Health Organisation's (WHO) health system's building blocks: service delivery, health workforce, information, medicines/technologies, financing and leadership/governance (United Nations Development Programme (UNDP), 2020).

Adua *et al*. (2017) observed that private spending on health, especially out-of-pocket payments, declined but was higher than the World Health Organisation's recommended financial threshold. Also, while government's investments on healthcare have yielded positive results, the improvement in the health outcomes cannot be attributed to increased health expenditure alone.

Supporting the above, another study argued that structural investments in healthcare delivery in post-independence Ghana have not been comprehensive or integrated (United Nations Development Programme (UNDP), 2020). United Nations Development Programme (2020) explains this by noting that the neglect of important building blocks (e.g. medicines/technologies, leadership/governance), the selective use of evidence in policy development and implementation, the lack of integration of existing strategies and poor management of pluralistic health systems have led to a chronic challenge of inaccessible, inequitable and unresponsive health services, particularly for poor and rural communities.

In terms of healthcare staffing, there are about 52,258 individuals currently formally working in the health sector in public, Christian Health Association of Ghana (CHAG), private, Islamic Missions, quasi-government and other organisations in Ghana (Ministry of Health (MoH), 2020).

A Ministry of Health (2020) document shows that the MOH employs 42,299 staff in GHS, teaching hospitals, CHAG and health training institutions, regulatory bodies and headquarters. This number represents about 81.5% of the total health sector workforce. Non-clinical support staff including administrators, accountants, drivers and technicians and clinical support staff including health aides and ward assistants constitute about 38% of the total workforce officially employed. Apart from the total workforce in formal employment, about 21,791 people countrywide are registered as engaged in traditional medicine while 367 persons are registered traditional birth attendants (TBAs). This indicates that about 69,000 people are known to be involved in healthcare delivery countrywide (Ministry of Health (MoH), 2020).

Prisons system

Historically, the developments of prisons in Ghana started in the early 1800s with emphasis on punishments rather than on safe custody (Ghana Prison Service, 2020). These developments started during the early 19th century when the British government adopted the indirect rule system of government as a result of which the District Commissioners were appointed to see to the day-to-day administration of the colonies. The establishment of prisons was part of this colonial administrative system (Ghana Prison Service, 2020).

The study was conducted in seven out of the forty-two prisons in Ghana. It will be recalled that there are forty-two prison establishments in Ghana which are distributed across the sixteen regions in Ghana (Ghana Prisons, 2020). However, this distribution is uneven with some regions having far larger prison populations than other regions (Ghana Prison Service, 2020).

Administratively, the Ghana Prisons Service comprises forty-five establishments as follows: Prisons Headquarters, Prison Officers' Training School, Senior Correctional Centre (formerly Ghana Borstal Institute), one maximum security prison, one medium security prison, seven central

prisons, seven female prisons, fourteen local prisons, three open camp prisons and nine agricultural settlement camp prisons (Ghana Prison Service, 2020).

Prisons in Ghana are categorised according to three (3) levels of security namely maximum, medium and minimum and with different degrees of social interaction and freedom of movement. Prisons in Ghana are also classified based on the activities undertaken at the various establishments as explained below.

Maximum prison

The maximum security prison is located at Ankaful Prisons Complex on the main Ankaful – Elmina road, Cape-Coast in the Central Region of Ghana and it comprises three other prisons namely Contagious Disease Prison, Main Camp Prison and Ankaful Annex Prison. The maximum security prison is the regional headquarters and it was commissioned on 8th November, 2011 to aid in decongesting the prisons in Ghana (Ghana Prison Services, 2020).

The maximum security is a highly secured prison facility designed to hold high profile prisoners and habitual reoffenders. The prison meets international maximum security specifications and standards and houses about two thousand prisoners. There is strict control and monitoring with regards to prisoners' movement as well as minimal interaction between staff and inmates in a maximum prison (Ghana Prison Service, 2020).

Medium prison

The medium security prison is like the maximum-security prison and it was used to hold high sentence and aggressive prisoners before the provision of a maximum prison facility in 2011 (Ghana Prison Service, 2020). The Nsawam Medium Security Prison is the largest prison with medium security status in Ghana and it is located at Nsawam in the Eastern Region of Ghana. The Nsawam Medium Security Prison is established on a one mile square plot of land located at the outskirts of the Nsawam township and it houses prisoners who are mostly convicted of serious and violent crimes (Ghana Prison Service, 2020). Medium security prison is a custody level in which

design and construction as well as inmate classification reflect the need to provide secure external and internal control and supervision of inmates. Inmates accorded this status may present a moderate escape risk or may pose a threat to other inmates, staff or the orderly running of the institution (Ghana Prison Service, 2020).

Central prisons

One of the prison categorisations is the central prisons. The central prisons are facilities also known as minimum security prisons. Additionally, a central/minimum level security prison is a custody in which both design and construction as well as inmate classification reflect the goal of returning inmates to a greater sense of personal responsibility (Prison Service, 2020). There are seven of such facilities in Ghana which are mainly located in the administrative capitals of the regions except for Central, Greater Accra and Eastern regions. Currently, the central prisons in Ghana are as follows: Kumasi Central Prison, Ho Central Prison, Sekondi Central Prison, Tamale Central Prison, Wa Central Prison, Navrongo Central Prison and Sunyani Central Prison (Prison Service, 2020).

In the central prisons, trade training facilities are provided to equip prisoners with employable skills for their effective reintegration into society. They take custody of long-sentenced prisoners. They are the central points for all categories of prisoners, apart from condemned prisoners (Ghana Prisons, 2020).

Local prisons

Below the central prisons categorisation is the local prisons. The local prisons are facilities also known as minimal internal security prisons. Local prisons are mainly responsible for the safe custody and welfare of inmates due to the lack of space for trade training activities. They usually take custody of short-sentenced prisoners (Ghana Prisons, 2020).

Open camp prisons

Below the local prisons are the open camp prisons. Open camp prisons undertake agricultural activities to provide food and train inmates in modern agricultural practices. Prisoners who are

about to be released are at times transferred to these facilities as transit to prepare them for their final release into society (Ghana Prisons, 2020).

Agricultural settlement camps

Below the open camp prisons are the agricultural settlement camps. In agricultural settlement camps, the level of security is quite relaxed; they are usually not fenced. The main objective is to train inmates in agricultural activities and produce enough food to supplement the feeding of inmates and generate some income for the Prisons Service (Ghana Prisons Service, 2020).

In general terms, prisoners convicted of serious/violent crimes are mostly placed in Nsawam Prison, the largest prison with medium-high security. However, the placement of prisoners at the central and local prisons and agricultural camps varies and is not according to type of conviction or length of imprisonment. Generally, the local prisons and agricultural camps have far more relaxed security levels than the central and national prison, enabling greater social interaction and freedom of movement (Ghana Prisons, 2020).

Senior correctional centre

The senior correctional centre is the only institution in Ghana that caters for young offenders who are less than 18 years of age (Ghana Prison Service, 2020). The centre takes care of young offenders by training them for a period between six months and two years in various vocational trades like welding, vulcanizing, tailoring, carpentry, draftsmanship, auto electrical and mechanical and general electricals. They are also given tuition in the classroom on topics such as Information and Communications Technology (ICT) as well as moral education (Ghana Prison Service, 2020).

Male only prisons

In addition to the aforestated, the prisons are categorised as male or female prisons. The male prisons are categorised as:

1. One maximum/high level security prison

2. One large national medium/high level security prison
3. Six central/low level security prisons
4. Fifteen smaller local/low level security prisons
5. Twelve agricultural camps with lower levels of security

Study sites: Female only prisons

This study involved all the seven female prisons in Ghana: Akuse Female Prison, Ho Female Prison, Kumasi Female Prison, Nsawam Female Prison, Sekondi Female Prison, Sunyani Female Prison and Tamale Female Prison. All these prisons together with their prisoner numbers have been outlined in table 3.1. Generally, the female prisons are facilities that are dedicated to hold female offenders in accordance with international standards of correctional management. Each of these prisons has been described below.

Nsawam Medium Security Prison – Female prison section

The Nsawam Prison is Ghana's largest medium security prison located in Nsawam in the Eastern Region of Ghana and approximately 40km from Accra (Ghana Prisons, 2020). It is located in the south-eastern part of the Nsawam township on the outskirts along the Accra-Nsawam trunk road. It is bordered on the east by Aburi, on the west by Adiaso Traditional Area, in the north by Teacher Mante and in the south by Medie. Nsawam is diverse in nature and most of the residents are natives of the land with a few who have migrated from communities nearby. Many people in Nsawam are from the suburbs in the Eastern Region (Ansre, 2010).

The Nsawam Medium Security Prison which was built in the early 1960's by the Government of Ghana is located on 823.027 acres of land. It received its first inmates on 10th October, 1960 (Ghana Prisons, 2020). A Ghana Prisons Service (2020) document indicates that the establishment of the Nsawam Medium Security Prison was necessitated by overcrowding in the central prisons in Ghana at the time (such as Kumasi, Sunyani, Winneba and Ho among others) and based on the McCarthy Committee on Prisons' recommendation that a new prison be built at Nsawam near Accra. Prisoners in this prison include Ghanaians and other nationals with crimes such as theft,

assault, fraud, embezzlement, contempt of court and manslaughter. The Nsawam Medium Security Prison holds the following category of inmates; remand prisoners, convicted prisoners, prisoners on life sentence (lifers) and prisoners on death row (condemned prisoners) (Ghana Prisons, 2020).

Like all other prison establishments in Ghana, the Nsawam Medium Security Prison has a mission of providing accommodation for prisoners, counselling prisoners and rehabilitating prisoners through vocational training (Ghana Prisons, 2020). However, not all prisoners can access the vocational opportunities available at the prison. For instance, long term prisoners are qualified to learn the skills while prisoners with a year term or less are disqualified. In addition, prisoners on death row or life imprisonment cannot access vocational training in prison (Ghana Prisons, 2020). Nonetheless, some exceptions are made especially when there is the possibility of a presidential pardon (Ansre, 2010; Ghana Prison Services, 2020). One of the major problems facing the prison is congestion. Initially, it was built to accommodate 717 inmates but has exceeded its ideal average capacity (Ghana Prison Service, 2020). The Nsawam Medium Security Prison has two main divisions; the male prison and female prison.

The Nsawam Female Prison was opened on the 10th December, 1973. It is the biggest female prison in Ghana and was established to provide safe custody for female prisoners and seek their welfare and reformation (Ghana Prisons, 2020). Similar to the male prison, the Nsawam female prison houses the following category of inmates; remand prisoners, convicted prisoners, prisoners on life sentence (lifers) and prisoners on death row (condemned prisoners) (Ghana Prisons, 2020). Thus, the study involved inmates in the female prison.

Akuse Local Prison – Female prison section

The Akuse Local Prison is located in the Lower Manya Krobo Municipality of the Eastern Region of Ghana on a land of 28.5 acres. It was converted from a mercantile warehouse to a prison facility with original capacity of sixty (60) but it currently holds a hundred and eighty (180) inmates (Ghana Prison Service, 2020).

In addition to the male prison, the Akuse township has a female prison. The Akuse Female Prison is located in the Lower Manya Krobo municipality of the Eastern Region of Ghana and is located on the same piece of land as the male prison. The prison holds convicts and remand prisoners (Ghana Prison Service, 2020).

Sekondi Female Prison

Similar to the Sekondi Central Prison, the Sekondi Female Prison is located in Sekondi in the Western Region of Ghana (Ghana Prison Service, 2020). The Sekondi Central Prison was constructed in the colonial days with the initial aim of containing 150 inmates. However, it now contains a total of 869. This means that the prison centre is overpopulated. It is recorded that it has a total of 666 convicted inmates, 159 remand, 32 trial and 13 inmates sentenced to life imprisonment (Modern Ghana, 2020). Thus, the Sekondi Female Prison also holds only female convicts and remand prisoners (Ghana Prison Service, 2020).

Kumasi Female Prison

The Kumasi Female Prison is located at the centre of Adum in the Ashanti Region and is structurally attached to the Kumasi Central Prison. It has a total land size of 0.07 acres which houses four (4) cells measuring 1200ct7 each (Ghana Prison Service, 2020). The Kumasi Central Prison was established in 1901 soon after the British Government gained grounds to rule in the Ashanti Region (Ghana Prison Service, 2020). This was established to enable the colonial government to work effectively and to put fear in the indigenous people who posed as threat to their administration since several local and district courts were created by the colonial masters. The prison was established to confine lawbreakers to facilitate the smooth running of the British administration (Ghana Prison Service, 2020).

In 1925, the Kumasi Prison was reconstructed to increase the number of cells following the large number of inmates within the province. The site covers an area of 44,424 sq. ft. allowing 500 cubic feet for each prisoner. The station has several workshops, where inmates are trained in various trades/vocations, and an infirmary manned by medical personnel who cater for the medical needs of inmates as well as officers in case of minor ailments (Ghana Prison Service, 2020).

The Kumasi Female Prison was administered as part of the Kumasi Central Prison during its inception; admissions and discharges of inmates were done at the central prison and the officers working at the female section also reported directly to the central prison as well as all receiving technical assistance (Ghana Prison Service, 2020). The evidence shows that in 1991, the Kumasi Female Prison was granted full autonomous status which gave it the authority to take charge of its own affairs (Ghana Prison Service, 2020). The prison takes both convicts and remand prisoners (Ghana Prison Service, 2020).

Ho Female Prison

The Ho Female Prison shares a wall on the west, the workshop block and quarters block C on the east with the Ho Central Prison which is situated on a 4.147-acre land (Ghana Prison Service, 2020). The Ho Central Prison was established in 1948 in the Volta Region of Ghana as one of the four (4) prisons in the then Togoland Territory under the United Kingdom Trusteeship and was treated as an integral part of the prison system of the then Gold Coast (Ghana Prison Service, 2020).

The Ho Central Prison was established to cater for offenders who were convicted of various offences in the Volta Region. It was classified as a local prison and, for that matter, kept prisoners serving sentences of less than two (2) years only. The prison was upgraded to a central prison when the Ghana Prison Service became autonomous in 1964 (Ghana Prison Service, 2020). The prison is located in the heart of Ho Bankoe opposite the municipal hospital in the Volta Region. The perimeter wall is made of stones with razor on top of the walls. The categories of prisoners are convicted prisoners and remand prisoners (Ghana Prison Service, 2020).

Sunyani Central Prison – Female prison section

The Sunyani Central Prison is located in Sunyani, the capital of the Bono Region, with an estimated 826 inmates (Modern Ghana, 2020). Evidence shows that the prison was established to accommodate 500 prisoners but currently accommodates over 800 prisoners (Dogbe et al., 2016). The Sunyani Municipality or the Bono Region has a population of over 200,000 (Ghana Statistical

Service (GSS), 2020). The Sunyani Central Prison houses both the male and female prisons in separate structures. These are mostly convicted and remand prisoners (Ghana Prison Service, 2020).

Tamale Central Prison – Female prison section

The Tamale Central Prison located in the Tamale township area was established in 1914 with an inmate capacity of 78 with the view of decongesting some of the prisons in Ghana. It has operated as a single facility in the past (Ghana Prison Service, 2020). However, the Tamale Central Prison currently shares the same gate with the two-block female prison (Ghana Prisons, 2020).

Both male and female prisons have a holding capacity of close to 1,000 prisoners but over the recent years, the population has increased with the main problem of congestion resulting in many inmates sharing cell mates (Ghana Prison Service, 2020). The Tamale Central Prison has since its inception introduced some training programmes for its inmates including basic literacy programmes (through the Presidential Special Initiative Programme), block mounding/laying and concreting, smock weaving, basketry, tailoring and religious activities (Ghana Prison Service, 2020).

3.6.2. Study population

This section presents the study population or participants involved in the study. Ghana's prisons house between 11,000 and 14,000 inmates with females forming approximately 1.2% of the prison population (Ghana Prison Service, 2020). Usually, prison inmates are supposed to be placed in a prison in a town or city (region) where they are sentenced/convicted. However, this is a fluid situation, given that inmates are periodically moved between prisons depending on factors such as overcrowding, inmates' behaviour and time remaining on their sentence (Ghana Prison Service, 2020).

The study population consisted of all female inmates; encompassing those on remand, those convicted and those sentenced. The total population of female inmates was estimated at 316 based

on statistics as of December 2017 (Ghana Prisons Service, 2020). However, it should be noted that prison inmates' numbers do change or fluctuate from time to time.

Inclusion criteria for study participants

The inclusion criteria were:

1. The participant should be a female prisoner.
2. The participant should be an adult female prisoner aged 18 years and above.
3. The participant should be either on remand, convicted or sentenced.
4. Participant should have spent a length of imprisonment from under one year through to life sentence or death row.
5. The participant should be a Ghanaian and or a foreigner who speaks English or any of the Ghanaian languages.
6. The participant should be an inmate in one of the female prison locations or categories (medium, central and local) of female prisons in Ghana.

Exclusion criteria

The study excluded participants on the following basis:

1. A male prisoner.
2. A female prisoner aged less than 18 years.
3. Female prisoners whose length of imprisonment was less than 24 hours.
4. Prisoners in police custody awaiting transfer to a prison.
5. Female prisoners who, in the judgment of the prison staff, represented too great a risk for harm to themselves or interviewers.
6. Female prisoners who were not competent (sick or intellectually immature) to take part in the survey.
7. Prisoners who were foreigners who could not speak English or any other Ghanaian language.

Sampling method

This section presents the method used to sample or recruit participants into the study. It would be recalled that female prisoners were approximately 316, scattered nationally across seven (7) prison locations (Ghana Prison Service, 2020). Given the small population size, a census was conducted among all the female inmates who consented to be part of the study. The census sampling strategy was applied to recruit participants. This census sampling method offered the researcher the opportunity to gain a sample of almost all female prisoners in Ghana. Almost all female prisoners in Ghana willingly participated in this study.

Practically, a total of 312 out of the estimated 316 female inmates took part in this study. The breakdown is shown in Table 3.1. Thus, this study was a census which involved all female inmates from all the seven (7) female prisons in Ghana. This allowed all the female prisoners to voluntarily participate in this study. A list of all female prisoners was obtained from the prison authorities and numbers in the list provided were used for easy identification of participants. Participants were then called by their names and given unique serial numbers. Prisoners were identified only by their unique identifying number(s) generated from the prison records. Since the serial numbers were used, their names were not written on the questionnaires. Participants who during the interview decided not to participate were dropped immediately and the next participant was interviewed.

Table 3.1: Population of female prisoners in Ghanaian prisons

Name of prison	Number of female prisoners	Actual number interviewed
Akuse Local/Female Prison	22	22
Ho Central/Female Prison	28	27
Kumasi Central/Female Prison	46	45
Nsawam Female Medium Security Prison	146	144
Sekondi Central/Female Prison	33	33
Sunyani Central/Female Prison	25	25
Tamale Central/Female Prison	16	16
Total	**316**	**312**

Study Variables

The variables measured in the study were divided into both dependent and independent as explained below.

Dependent variables

Conceptually, the three dependent variables of interest for this study were comprehensive knowledge of HIV transmission and prevention, HIV-risky behaviour in prison and personal HIV risk perception.

Comprehensive knowledge of HIV/AIDS transmission and prevention: Measurement was adopted from the Ghana Demographic and Health Survey (2014) data (Ghana Statistical Service, 2015).

Independent variables

The independent variables included the following:

1. Socio-demographic characteristics: Age, educational background, marital status, religion and country of residence.
2. Prison environment: Type of prison sentence and duration of stay in prison/number of years spent in prison during present incarceration and number of times incarcerated.
3. HIV-related risk behaviours: Operationalised into four measurable dependent variables which include injection drug use (IDU), sexual risk behaviour, tattooing/piercing and sharing razors/blades.

3.6.3. Data collection techniques and tools (Questionnaire design and administration)

Empirical data for the study was collected between November 2017 and February 2018 in Ghana. A structured questionnaire was designed and used to capture data. Since this was a quantitative study, most questions were closed-ended in a questionnaire which consisted of 92 questions. The questionnaire was divided into seven sections as explained below.

Section one consisted of questions seeking to gather information on socio-demographic characteristics: age, country of residence, nationality, educational background and religion.

Section two asked questions to address the objective on the prison environment: type of prison sentence, duration of stay in prison/number of years spent in prison during present incarceration and number of times incarcerated. This had eight questions, for instance, “Are you on remand or convicted?” The responses were: on remand = 1, convicted = 2 and no response = 99.

One of the key objectives was to examine the HIV-related risk behaviours. The World Health Organisation (WHO) defines risk behaviour as a specific form of behaviour which is proven to be associated with increased susceptibility to a specific disease or ill-health, in this case HIV/AIDS (World Health Organisation (WHO), 2013). These HIV-risk behaviours were divided into specific risks and presented in three sections.

Section three asked questions on HIV risk related to blood contact. This was addressed by six questions which included, “Do you share razor/blade with other inmates in this prison?” The responses were: Yes = 1, No = 2, No response = 99.

Section four asked questions on HIV risk related to Injection Drug Use (IDU). This was addressed by thirteen questions which included, “Have you ever had to share needles with other drug users?” The responses were: Yes = 1, No = 2, No response = 99.

Section five asked questions on HIV risk related to sexual contact. This was addressed by nineteen questions which included, “Did you use a condom during your last sex in prison?” The responses were: Yes = 1, No = 2, No response = 99, Not applicable = 77.

Section six sought answers to questions on HIV/AIDS knowledge, attitude and health. The questions referring to HIV/AIDS knowledge were based on the Ghana Demographic and Health Survey (2014) data and this was to ensure comparison between the findings of this study and the general population. Female inmates were asked whether they have heard of an illness called AIDS. Respondents who reported having heard about AIDS were asked other questions about how to avoid contracting the disease and about HIV testing.

Section seven asked questions related to personal HIV risk perception which was in two folds: risk perception before imprisonment (outside prison) and risk perception during incarceration (in prison). Respondents were asked the following questions: “How would you rate your chances of getting HIV before coming to prison (the virus that causes AIDS)?” and “How would you rate your chances of getting HIV in prison (the virus that causes AIDS)?” The answers were measured using five levels such as: At no risk = 1, At low risk = 2, At high risk = 3, Already have HIV = 4 and No response = 99.

Additionally, respondents were asked about the strategies they used to prevent HIV infection during their stay in prison. Respondents were asked the following question: “What are you doing to protect yourself from getting HIV in prison?” The responses were: Do not share razor blades and needles =1, Use a condom = 2, Abstain from sex = 3, Other = 4, Nothing = 5 and No response = 99.

Every question in the questionnaire had a 'no response' category to ensure that respondents had the choice of refusing to answer any question they were uncomfortable with. Generally, the questionnaire was designed to use similar indicators as previous HIV prison studies in order to compare the findings in the data analysis (Adebayo et al., 2010). The questionnaire was administered to the participants by trained research assistants using the interviewer-administered strategy.

The trained research assistants were selected based on previous experience of conducting interviews using standardised questionnaires. Additionally, they were recruited to ensure anonymity. Interviews were done at calm places inside the prison where there was no interference from other inmates or prison officers. The interview was administered in either English or any other Ghanaian language. Each set of the questionnaires took approximately 35 minutes to complete, once the interviewer had become familiar with using it and following the skip patterns.

Data management and analysis

This section presents the strategies applied to analyse the returned questionnaires. This section is presented according to the key considerations in the data processing and analysis.

Key considerations in the analysis

The following key considerations were given in the analysis of the returned questionnaires.

Age of respondents

Participants were grouped into four different ages: 20-29, 30-39, 40-49 and 50+. For purposes of clarity, respondents' age at their last birthday was used.

Country of residence of prisoners

The assessment of the country of residence before imprisonment was grouped into 'Ghana' and 'Foreign'. The study described all female prisoners who were indigenes residing in Ghana as

'Ghanaians' in terms of their residence and all female prisoners who were living outside Ghana before their imprisonment were described as 'Foreigners' in terms of their residence.

Comprehensive knowledge of HIV/AIDS transmission and prevention

The comprehensive knowledge measurement was adopted from the Ghana Demographic and Health Survey (GDHS) 2014 data (Ghana Statistical Service, 2015). The GDHS data is a nationally representative survey that was first conducted in 1988 and has since been conducted roughly every five years (Ghana Statistical Service, 2015). As indicated earlier, comprehensive knowledge measurement was adopted from the Ghana Demographic Health Survey 2014 data. This was defined as: (1) knowing that both condom use and limiting sexual partners to one HIV negative person are HIV/AIDS prevention methods; (2) being aware that a healthy-looking person can have HIV; and (3) rejecting the two most common local misconceptions that the AIDS virus can be transmitted through mosquito bites and by supernatural means (Ghana Statistical Service (GSS), 2015).

Sexual risk behaviour

The World Health Organisation (WHO) defines risk behaviour as a specific form of behaviour which is proven to be associated with increased susceptibility to a specific disease or ill-health, in this case HIV/AIDS (World Health Organisation (WHO), 2013). Sexual risk behaviour was defined as having sex with a casual sex partner or multiple sexual partners without using a condom (Chawla and Sarkar, 2019).

HIV-related risk behaviours

This study operationalised HIV-related risk behaviours into four measurable dependent variables: injection drug use (IDU); sexual risk behaviour; tattooing/piercing; and sharing razors/blades. Questions on respondents' HIV-related behaviours before imprisonment and in prison were analysed.

Data processing and analysis

Data was entered from the questionnaires into Statistical Package for Social Sciences (SPSS) version 18.0 software (IBM Corporation, USA). The data entry was verified and cleaned twice. The questionnaires were processed and analysed using SPSS and STATA software version 13 (College Station, TX: StataCorp LP).

In order to limit this study to only potentially HIV negative female inmates, all female prisoners who participated in this study were asked if they had ever had an HIV test before this study and the possible response options were: (a) Yes =1, (b) No =2, (c) Don't know = 88 and (e) No response = 99. If a respondent had ever had an HIV test, she was asked of the test result. The response options were: (a) Positive =1, (b) Negative =2, (c) Don't know =88, and (e) No response = 99. For the analysis, respondents who had never had an HIV test before this study, those who did not know whether they had ever had an HIV test, those who tested HIV negative and those who did not know their HIV status even though they had been tested were considered potentially HIV negative. Only these potentially HIV negative female prisoners from the data set were used for further analysis in this study.

Descriptive statistics

First and foremost, descriptive statistics was applied to analyse the data (Trochim, 2020). Trochim (2020) indicates that descriptive statistics are used to describe the basic features of the data in a study and provide simple summaries about the sample and measures. Together with simple graphics analysis, they form the basis of virtually every quantitative analysis of data and are typically distinguished from inferential statistics (Trochim, 2020).

Descriptive statistics were generated to describe potentially HIV negative female inmates' (i) socio-demographic characteristics, (ii) prison environment, (iii) HIV-related risk behaviours (both before and during imprisonment), (iv) HIV/AIDS knowledge and (v) personal HIV risk perception (both before and during imprisonment). The findings were presented using frequency tables. The mean and variance for these factors were calculated where appropriate.

Bivariate analysis

Bivariate analysis was applied to establish the relationships between the dependent and independent variables (Sandilands, 2014). Sandilands (2014) explains that bivariate analysis refers to the analysis of two variables to determine relationships between them. This analyst notes that bivariate analysis is contrasted with univariate analysis (analysis of only one variable) and multivariate analysis (analysis of two or more variables simultaneously). In this study, bivariate analyses were conducted using STATA version 13 to determine whether there were significant associations between female prisoners' comprehensive knowledge of HIV/AIDS and socio-demographic characteristics, and the prison environment. That is, in this analysis, the dependent variable was prisoners' comprehensive knowledge of HIV/AIDS transmission and prevention.

Similarly, an earlier study applied bivariate and multivariate logistic regression analyses to determine the degree of association between HIV risk perception and the independent variables of age, ethnicity, religion, sexual experience and year of study (Shiferaw et al., 2014).

In addition, bivariate analysis was conducted to establish a plausible relationship between HIV risky behaviour of female prisoners and their socio-demographic characteristics and selected variables of interest. The following HIV-related risk behaviours in prison were used for this analysis: tattooing/piercing, injection drug use, sexual risk behaviour and sharing razors/blades. These self-reported HIV-related risk behaviours were used to generate a single variable called HIV-risky behaviour in prison.

The variable 'HIV-risky behaviour in prison' was categorised into two groups: no risk takers and risk takers. The 'HIV no risk takers' comprised of female inmates who did not engage in any risky behaviour in prison; and the 'HIV risk takers' were made up of female inmates who engaged in one or more of the HIV-related risk behaviours in prison. This approach of segmenting female prisoners with HIV-related risk behaviours into 'no risk takers' and 'risk takers' was a control for behaviour and to examine HIV risk perception within each group. This method has been applied in previous studies (Staton-Tindall et al., 2015).

It would be recalled that personal HIV risk perception which was one of the dependent variables of interest for this study was assessed based on responses to the following question: "How would you rate your chances of getting HIV (the virus that causes AIDS)?" For further analysis, a binary variable was created for personal HIV risk perceptions of female prisoners as either being at some risk (at low risk and high risk) or at no risk of acquiring HIV. A similar strategy was applied in a study among African American adolescent girls (Danielson et al., 2014).

Pearson chi-square test was used for variables with categorical values and Fisher exact test for those with small frequencies. The Chi-square test is intended to test how likely it is that an observed distribution is due to chance (Upenn, (2020). Upenn (2020) indicates that Pearson chi-square is also called a 'goodness of fit' statistic because it measures how well the observed distribution of data fits into the distribution that is expected if the variables are independent.

A 95% confidence interval ($p<=0.05$) was used to determine statistical significance. Given the risk that bivariate associations could be confused by confounding factors, a multivariable analysis using logistic regression was also carried out using STATA version 13 to establish ultimately factors that were significantly associated with female prisoners' comprehensive knowledge of HIV, HIV risky behaviour and personal HIV risk perception during incarceration.

Two multivariable models were used, each with a different research question and different dependent and independent variables. To examine the factors that predicted personal HIV risk perception in prison and HIV-risky behaviour, two different multivariable models were adopted. The multivariable model for personal HIV risk perception in prison permitted the calculation of the probability that a respondent perceived herself to be at some risk or at no risk of contracting HIV in prison, given other covariates of interest such as HIV risky behaviour, marital status and age group. The other multivariable model had "HIV-risky behaviour" as the dependent variable and the following independent variables; education and religion. All the independent variables were check for multicollinearilty before been put into the regression model. Hidalgo and Goodman (2013) are of the view that multivariable analysis refers to statistical models in which there are multiple independent or response variables. These models were adopted for easy interpretation of

results which was achieved through the odds ratios available in the model and to examine the relationship between the dependent variable and the independent variables.

3.7. Quality assurance

Different strategies were applied to ensure that the data collected met the quality assurance standards expected. These have been explained below.

Training for data collection

The researcher recruited and trained some research assistants before the conduct of the main study. Eaton (2017) explains that research assistants are hired in accordance with policies and procedures whose duties may include, among other things, to assist with participant recruitment, obtain informed consent and keep accurate records for the project. Three research assistants were recruited who had had previous experience conducting one-on-one interviews using standardised questionnaires.

A two-day training workshop was provided for them on all aspects of the data collection for this research. Topics covered in the training/workshop included induction to the purpose, objectives, activities and procedures of this research; data collection and management: logistics, planning, timelines, field supervision and operational issues; informed consent procedure and ethical considerations; interview techniques involving the use of the standardised questionnaire; and prison regulations and standards. During this workshop, the recruited research assistants were trained on how to pre-test the questionnaires as shown below.

Pre-test

It was considered relevant to do a pre-test of the data collection instrument before the actual data collection. Lewis-Beck, Bryman and Liao (2004) demonstrated that field pre-test is a dress rehearsal for a survey and is an extremely useful tool that allows researchers to identify potential problems with survey items and/or data collection protocols prior to fielding a study.

The questionnaire was pre-tested on 104 inmates at the Winneba Local Prison in the Central Region which was not part of the sample. The pre-test assessed whether the questions were clear and easy to understand. Furthermore, it examined whether the listed categories of answers catered for all possible responses. As a result of the pre-test, there were minor changes to the wording of certain questions and categories of answers. Furthermore, the response categories were adjusted and expanded following the pre-test.

In the main study, attempts were made to ensure that completed questionnaires were manually checked daily for completeness before data entry into the computers. Although data entry errors might have occurred in the form of typological errors, these did not affect the data quality in a manner that the analysis could have led to invalid conclusion or deceptive outcomes. Generally, the data entry errors were random in nature and did not affect one prison more than the other and were easily detected and corrected simply by running field-code checks in Microsoft Excel and Stata version 13. The data was checked for range, consistency and discrepancies. During the data analysis, further checks were done by comparing the data from the three research assistants.

Addressing the biases

Some researchers opine that bias can occur in the planning, data collection, analysis and publication phases of research (Pannucci & Wilkins, 2010). Pannucci and Wilkins (2010) suggest that understanding research bias allows readers to critically and independently review the scientific literature and avoid treatments which are suboptimal or potentially harmful. There was the possibility that recall bias and measurement error might occur through the form that this study applied to collect data. Recall bias refers to differences in the recall of information by different participants (Althubaiti, 2016). Althubaiti (2016) notes that study participants can erroneously provide responses that depend on their ability to recall past events which in this case can be referred to as recall bias, as it is a result of recall error.

This study reduced recall bias by being careful not to collect data on events which took place a long time ago in the participant's life. Though there was a risk of recall bias resulting in

underestimates in respect to HIV-related risk behaviours such as drug injection use and sexual activity in prison, these could have been underreported.

Studies argue that device inaccuracy, environmental conditions in the laboratory or self-reported measurements are all sources of errors such that if these errors occur, observed measurements will differ from the actual values and this is often referred to as measurement error, instrumental error, measurement imprecision or measurement bias (Althubaiti, 2016). Measurement error bias could occur when participants respond to questions according to what they perceive to be the preferred or correct answer. The study minimised this error by the design and wording of questions in a neutral unbiased manner. Additionally, participants were assured that their responses were confidential and that there was no 'right' answer. Nevertheless, the sensitivity of the topic resulted in a few inmates refusing to respond to certain questions.

3.8. Ethical considerations

Different strategies were adopted to ensure that the study complied with acceptable ethical issues needed in studies involving human subjects as explained below.

Ethical clearance

Ethical clearance was granted by both the 'Ethik-Kommission' at Bielefeld University, Germany (Nr. 2017-062W1) and Ethics Review Committee of the Ghana Health Service, Ghana (GHS-ERC:016/09/17). The clearances are shown in appendices III and IV.

Permission from the study sites

A letter of introduction was written by the School of Public Health-Bielefeld University to the Ghana Prison Service to seek permission to carry out the survey in all the female prisons in Ghana. Research authorization was granted by the Ghana Prison Service (See appendix V).

Informed consent

A written, informed consent was designed and used to obtain consent from all participants. Those who could read and write signed the consent form. The written consent in the form of a signature or thumb print for participants who could not write was obtained as they were assured before participating in the study. This was further confirmed by the interviewer's signature for the consent on the questionnaire. Before the commencement of each interview, the participants were allowed to read or have the consent form/information sheet read to them in their spoken language such as Akan, Ga, Ewe, Dagaare, Dagbani, Nzema or English. They had the opportunity to ask any question that was related to the study. The consent form is shown in appendix I.

Confidentiality and anonymity

Participants were given the assurance that the study would not affect their sentence and stay in prison and that whatever information they disclosed to the research team was strictly for academic purposes. Participants were also informed that the questionnaire was anonymous and that their answers were strictly confidential. In order to ensure confidentiality, a unique number was used on each questionnaire. For instance, neither the respondents' name nor any other detail that would identify them was inscribed on the questionnaires. Interviewees were also provided information on the available existing services for their utilisation apart from the study.

All these were implemented as preparatory visits were made to the selected prisons. A list of all female inmates, either by name or unique ID numbers, was collected and enquiry was made as to how the list was compiled, that is, whether it was done based on the nature of offence or by length of sentence. During the preparatory visit, it was negotiated for key contact/liaison persons who were prison officers and their contact details such as names, telephone numbers and email address to be collected. The contacts of commanders or heads of these prisons were also collected so that further arrangements could be made later. Enquiries were made about the convenient time for data collection so as not to breach local security regulations.

Voluntary participation

The participants were informed that participation in the study was voluntary and that they had the option of refusing to participate entirely or if they chose to participate, would not be required to answer any question that they did not feel comfortable with.

Potential risks/benefits

Participants were assured that the study would not expose them to any harm or discomfort. However, they were encouraged that the findings of the study would provide evidence to inform future policy decisions regarding the provision of quality healthcare in the country in general and the prisons in particular.

Compensation

The participants were informed that they would not be compensated for their participation in the study as the data would be used for research and academic purposes only. The researcher and research assistants extended their appreciation to them for their participation and contribution.

Data storage

Participants were informed that hard copies of the data would be kept under lock and key and electronic versions would be password protected with only the researcher having access to them.

Declaration of conflict of interest

The researcher wishes to declare that there was no known conflict of interest in undertaking this research.

Funding information

The study was fully funded by the researcher with support from the Deutscher Akademischer Austauschdienst (DAAD). The researcher is very grateful for this financial support throughout the study.

CHAPTER FOUR

RESULTS

4.0. Introduction

This chapter presents the major findings from the descriptive analysis of the data which included 312 completed questionnaires. The chapter is presented in sections. Generally, section one presents results of HIV testing for female prisoners and the criteria for classifying participants as potentially HIV negative. This formed the basis for which information on only the potentially HIV negative female prisoners was used for further analysis. Section two presents the results pertaining to the socio-demographic characteristics and the prison environment of potentially HIV negative female prisoners. Section three presents the findings related to the HIV-related risk behaviours of potentially HIV negative female prisoners. This section is presented according to the following sub-headings: prevalence of tattooing/body piercing and sharing razors/blades, prevalence of injection drug use (IDU) and sexual risk behaviour among potentially HIV negative female prisoners. Section four presents the results on female prisoners and the availability of HIV health services.

Section five presents the results on knowledge of HIV/AIDS transmission and prevention with section six presenting the results on HIV risk perception and HIV risk reduction strategies used in prison. Section seven then presents the results of the bivariate analysis of comprehensive knowledge of HIV/AIDS by socio-demographic characteristics and prison environment. Section eight presents the results of the bivariate analysis of HIV risky behaviour in prison by selected variables of interest. Section nine presents the results of the bivariate analysis of personal HIV risk perception by selected variables of interest with section ten presenting the results of the impact of education and religion on HIV risky behaviour (Multivariable analysis). Section eleven presents the results of the impact of HIV risky behaviour in prison, marital status and age on personal HIV risk perception in prison (Multivariable analysis). Finally, section twelve presents the summary of the chapter where the main ideas are summed up.

4.1. HIV testing for female prisoners

This section presents the results on HIV testing of female prisoners. In all, 312 female prisoners from all the seven female prisons in Ghana responded to the questionnaires as against the estimated sample size of 316. This gave a response rate of 98.7% (312/316).

Table 4.1 shows results of HIV testing for all the female prisoners involved in the study. The results show that 73% of the female prisoners had ever tested for HIV before this survey, 23% had not been tested for HIV and 4% did not know whether they had ever been tested for HIV. The results show that almost all (93%) of the female prisoners who had ever tested for HIV were tested within the last 12 months, 4% were last tested for HIV between one and two years ago and 3% were last tested for HIV two or more years ago. Additionally, the results show that 31% of female prisoners had tested positive for HIV, majority (67%) had tested negative for HIV and 2% did not know their HIV status after testing.

In addition, the results showed that potentially HIV negative female prisoners were made up of the 71 female prisoners who had never been tested for HIV, the 12 who did not know whether they had ever been tested for HIV or not, the 153 who had tested negative for HIV and the 5 who did not know of their HIV status after the HIV test. Only this sub sample (241) of female prisoners who were considered as potentially HIV negative were used for further analysis.

Table 4.1: HIV testing for all female prisoners

Variable	Frequency (N = 312)	Percent
Ever tested for HIV		
Yes	229	73.4
No	71*	22.8
Do not know	12*	3.8
Last time tested for HIV		
Less than 12 months	213	93.0
1-2 years ago	10	4.4
2+ years ago	6	2.6
HIV test result		
Positive	71	31.0
Negative	153*	66.8
Do not know	5*	2.2
Potentially HIV negative		
Never tested for HIV	71	29.5
Do not know whether ever tested for HIV or not	12	5.0
HIV negative	153	63.5
Do not know HIV status	5	2.0

*Potentially HIV negative female prisoners

4.2. Socio-demographic and prison characteristics of female prisoners

This section presents the results on the socio-demographic and prison characteristics of respondents which include their age, education, religion, marital status, country of residence, type

of prison sentence and length of stay in prison and being ever imprisoned. Results relating to each of these characteristics are explained below (see Table 4.2).

Age of respondents

Respondents were grouped into different age categories. In the sample, age of the respondents varied between 18 and 76 years (Mean= 35.9; Standard Deviation (SD) = ±10.8). The results show that 34% of the female prisoners were in the age group 20-29 years, 33% were in the age group 30-39 years and 20% were in the age group 40-49 years. The minority (13%) of female prisoners were in the age group 50 years and over. It was observed that the proportion of female prisoners in each age group generally decreased as age increased.

Level of education of female prisoners

The distribution of female prisoners by the highest level of education attained showed that majority (41%) of female prisoners had had no formal education, 16% had obtained primary education, 35% had obtained high school education and only 8% had completed college/university.

Religious affiliation of female prisoners

On religious affiliation, the results showed that majority (64%) of the respondents were Christians, 31% were Muslims and 5% were either traditionalists or spiritualists.

Marital status of female prisoners

On the issue of marital status of female prisoners, the results showed that a higher proportion (48%) had never been married, 29% were 'married', 16% were 'divorced/separated' and 8% were 'widowed'.

Country of residence of female prisoners

The results on the country of residence of female prisoners before their imprisonment revealed that 85% resided in Ghana and 15% resided in foreign countries.

Type of prison sentence being served by female prisoners

On the type of prison sentence described as either 'convicted' or 'remand', the results indicated that majority (76%) had been convicted and 24% were on remand.

Length of stay in prison

The result on the female prisoners' length of stay in prison showed that majority (58%) had been imprisoned for less than 1 year, 22% had been confined for between 1 and 3 years and 20% had been incarcerated for 3 years and above.

Ever been imprisoned

Results relating to how often female prisoners had been in and out of confinement revealed that 96% had never been imprisoned apart from their current sentence and 4% had ever been imprisoned before their current incarceration.

Table 4.2: Socio-demographic and prison characteristics of potentially HIV negative female prisoners

Background characteristics	Frequency (N=241)	Percent
Age (years)		
20-29	83	34.4
30-39	80	33.2
40-49	47	19.5
50+	31	12.9
Education		
No education	99	41.1
Primary	39	16.2
High school (JSS/SSS)	84	34.8
College/University	19	7.9
Religion		
Christian	154	63.9
Muslim	75	31.1
Traditional/Spiritualist	12	5.0
Marital status		
Never married	115	47.7
Married	69	28.6
Divorced/separated	38	15.8
Widowed	19	7.9
Country of residence		
Ghana	204	84.6
Foreign	37	15.4
Type of prison sentence		
On remand	57	23.7
Convicted	184	76.3
Duration of stay in prison		
Less than 1 year	139	57.7
1 – 3 years	53	22.0
More than 3 years	49	20.3
Ever been imprisoned		
Yes	10	4.1
No	231	95.9

4.3. HIV-related risk behaviours among female prisoners

Information was collected on four behaviours related to HIV transmission among the female prisoners. These were tattooing/body piercing, injection drug use, sharing razor/blades and sexual risk behaviour. Table 4.3a displays results on tattooing/body piercing and sharing of sharp instruments/razor blades, Table 4.4b displays results on tattooing both outside and inside prison, Table 4.5c displays results on injection drug use, Table 4.6d displays injection drug users (IDU) both outside and inside prison and Table 4.7e shows the results of sexual risk behaviour culminating in the overall theme of HIV-related risk behaviours.

4.3.1. Tattooing/body piercing and sharing razor/blades

Questions on tattooing covered two periods: before imprisonment and inside prison. The results show moderate levels (26%) of tattooing/piercing before imprisonment while the majority (74%) stated that they had never been tattooed/pierced before imprisonment. However, 52% reported that the same implement was used for other people outside prison and 47% of those who had tattooed/pierced before imprisonment reported that the same implement was not used for other people. Likewise, the results indicated that moderate levels (29%) of tattooing/piercing occurred within prison while 71% had never tattooed/pierced within prison. Almost all the female prisoners (99%) who had ever tattooed/pierced while in prison had shared the same implement with other prisoners. Only 1% reported that the same implement was not used to tattoo/pierce other inmates. In addition, 42% reported that they shared sharp instruments such as razor blades with other prisoners while 58% stated that they did not share sharp instruments with other prisoners. Table 4.3a displays results on tattooing/body piercing and sharing of razor blades.

Table 4.3a: Tattooing/body piercing and sharing razor/blades

Variable	Frequency (N=241)	Percent
Ever been tattooed or pierced (outside prison)		
Yes	63*	26.1
No	178	73.9
Ever been tattooed or pierced (within prison)		
Yes	69**	28.6
No	172	71.4
Same implement used for other people outside prison		
Yes	33*	52.4
No	30	47.6
No response	1	3.0
Same implement used for other people within prison		
Yes	68**	98.6
No response	1	1.4
Sharing razor/blades in prison		
Yes	100	41.5
No	141	58.5

* Sample for only those who had tattoos/pierced outside prison

** Sample for only those who had tattoos/pierced within prison

4.3.2: Tattooing both outside and inside prison

A bivariate analysis (two-by-two table) was conducted to investigate female prisoners who tattooed before and during imprisonment. This was to establish whether tattooing was a behaviour that was copied within prison or a general behaviour of the inmates before imprisonment. The results show that there was a statistically significant association between tattooing before imprisonment and tattooing during imprisonment ($p<0.001$). More than half (51%) of female prisoners who had tattooed before imprisonment had acquired more tattoos inside prison.

However, majority (81%) of female prisoners who did not tattoo before imprisonment did not acquire tattoos inside prison. Table 4.4b displays results on tattooing both before imprisonment and during imprisonment.

Table 4.4b: Tattooing before imprisonment and during imprisonment (N=241)

Ever tattooed outside prison?	Ever tattooed inside prison (%)		*P*- value
	Yes	No	
Yes	50.9	49.1	
			0.000
No	18.8	81.2	

4.3.3. Injection Drug Use (IDU)

Series of questions were posed to the female prisoners to find out whether they injected drugs. The results revealed that low levels (5%) of IDU were reported to have happened before imprisonment while the majority (95%) reported that they had never injected drugs before imprisonment. Moreover, the results on the history of shared IDU/needles before imprisonment was high (67%). Nonetheless, 33% of female prisoners indicated that they had never shared IDU/needles with other people before imprisonment. Furthermore, low levels (5%) of IDU were reported in prison. Among the 5% of respondents who injected drugs in prison, absolute levels (100%) of needle sharing were noted. Table 4.5c displays results on injection drug use.

Table 4.5c: Injection Drug Use (IDU)

Variable	Frequency (N=241)	Percent
Ever injected drugs before imprisonment		
Yes	12*	5.0
No	229	95.0
Ever injected drugs in prison		
Yes	11**	4.6
No	230	95.4
IDUs sharing needles (outside prison)		
Yes	8*	66.7
No/No response	4	33.3
IDUs sharing needles in prison		
Yes	11**	100.0
No	0	0.0

* Sample for only those who have ever injected drugs before imprisonment

** Sample for only those who have ever injected drugs within prison

4.3.4: Injection Drug Use (IDU) both outside and inside prison

A bivariate analysis (two-by-two table) was conducted to discover female prisoners who were involved in injection drug use (IDU) before and during imprisonment. This was to establish whether injection drug use (IDU) was a behaviour that was copied within prison or a general behaviour of the inmates before imprisonment. The results showed that there was a statistically significant association between those who had ever injected drugs before imprisonment and those who had ever injected drugs inside prison (p<0.001). The results showed that 75% of female prisoners who had injected drugs before imprisonment continued to inject drugs inside prison. However, majority (93%) of female prisoners who had never injected drugs before imprisonment

did not inject drugs inside prison. Table 4.6d displays injection drug use (IDU) both before imprisonment and inside prison.

Table 4.6d: Injection Drug Users (IDU) before imprisonment and inside prison

Injection Drug Users (IDU) outside prison	Injection Drug Users (IDU) inside prison		*P*- value
	Yes	No	
Yes	75.0	25.0	0.000
No	7.1	92.9	

4.3.5. Sexual risk behaviour among female prisoners

The results of sexual risk behaviour among female prisoners indicated that majority (64%) admitted that they had had casual sex partners before their imprisonment against 36% who reported that they did not have casual sex partners in the last 12 months before their incarceration. Additionally, 20% reported to have had multiple casual sex partners in the year before the survey. The results showed that 76% had "never used" condom with casual sex partners in the last 12 months while 5% reported that a condom was used "every time" with a causal sex partner.

Low levels (12%) of penetrative sex with other inmates or prison staff were reported to have occurred during imprisonment. In addition, the results showed that a lower level (8%) of condom use during recent sex in prison was reported. The results revealed that 79% of female prisoners had ever received money or goods for sex while in the prison. Table 4.7e shows the results on the sexual risk behaviour among female prisoners.

Table 4.7e: Sexual risk behaviour

Sexual contact	Frequency (N=241)	Percent
Casual sex partners before imprisonment		
Yes	154	63.9
No	87	36.1
Condom use with casual sex partners		
Never used	117	76.0
A few times	30	19.5
Every time	7	4.5
Penetrative sex with other inmates or prison staff		
Yes	28	11.6
No	213	88.4
Condom use during recent sex in prison		
Yes	3	7.5
No	25	92.5
Ever received money or goods (e.g. cigarettes, drugs, blades) for sex in prison		
Yes	22	78.6
No	6	21.4

4.4. Female prisoners and the availability of HIV health services

This section presents results of the analysis relating to the availability of HIV-related health services provided in female prisons in Ghana. The results show that majority (65%) of the female prisons reported that HIV services were offered in their respective prisons. In addition, 65% reported that their prison offered HIV/AIDS education and 61% of female prisoners reported that they were aware or had seen HIV testing been done in their respective prisons. The results reveal that 71% of respondents were not aware of HIV treatment being offered to inmates in prison and 88% reported that they were not aware of HIV support groups in their respective prisons.

Additionally, 65% indicated that HIV services were accessible to every prisoner. Table 4.8 shows the results on the available HIV-related health facilities in female prisons.

Table 4.8: Female prisoners and the availability of HIV health services

Characteristics	Frequency	Percent
HIV services in prison		
Yes	157	65.1
No	84	34.9
Type of HIV services:		
Education		
Yes	157	65.1
No	84	34.9
HIV testing		
Yes	148	61.4
No	93	38.6
Treatment		
Yes	69	28.6
No	172	71.4
HIV Support groups		
Yes	28	11.6
No	172	88.4
Are the HIV services accessible to every prisoner		
Yes	157	65.1
No	84	34.9

4.5. Knowledge of HIV/AIDS transmission and prevention among female prisoners

This section presents the analysis of results relating to the level of knowledge of HIV/AIDS transmission and prevention among female prisoners. In addition, respondents were asked to

respond to questions on the common HIV/AIDS misconceptions. The findings are presented according to the following sub-sections as presented in table 4.9.

Ever Heard of AIDS

The results showed that the level of knowledge of HIV/AIDS among the female prisoners was universal as all (100%) of them indicated that they had heard of HIV/AIDS.

HIV transmission by mosquito bites

The results show that 33% indicated that HIV could be transmitted through mosquito bites while 56% stated otherwise. Apart from these, 11% noted that they did not know whether HIV could be transmitted through mosquito bites.

Acquiring HIV through witchcraft /supernatural means

The results revealed that as high as 55% reported that one could get HIV through witchcraft while 14% indicated that they did not know whether one could acquire HIV through witchcraft/ supernatural means. The prevalence of misconception of HIV transmission was high (69%) among the female prisoners.

Possibility of a healthy-looking person to have HIV

The results revealed that 79% of respondents indicated that it was possible for a healthy-looking person to have HIV while 8% of the female prisoners did not know whether a healthy-looking person could have HIV.

Reduction of chance of getting HIV by having one uninfected partner

The results revealed that 81% of the female prisoners reported that it was possible that having only one uninfected partner could reduce their chance of getting HIV. Nonetheless, 5% indicated that

they did not know whether having one uninfected faithful partner could reduce the chance of getting HIV.

Reduction of HIV by using condoms all the time

The results indicated that majority (70%) of the female prisoners reported that people could reduce their chance of getting HIV by using a condom every time that they had sex while 4% reported that they did not know whether consistent use of condoms during sexual intercourse could reduce one's chances of getting HIV.

Reduction of HIV transmission by not having sex at all

The results showed that 71% of the female prisoners agreed that HIV transmission could be reduced by not having sex at all.

Table 4.9: Knowledge of HIV/AIDS transmission and prevention among female prisoners

Characteristic	Frequency (N=241)	Percent
Ever heard of HIV/AIDS		
Yes	241	100.0
No	0	0.0
HIV transmission by mosquito bites		
Yes	79	32.8
No	136	56.4*
Do not know	26	10.8
Getting HIV through witchcraft/ supernatural means		
Yes	132	54.8
No	76	31.5*
Do not know	33	13.7
Possibility of a healthy-looking person to have HIV		
Yes	191	79.2*
No	31	12.9
Do not know	19	7.9
Reduction of chance of getting HIV by having only one uninfected partner		
Yes	195	80.9*
No	34	14.1
Do not know	12	5.0
Reduction of HIV by using condoms all the time		
Yes	168	69.7*
No	64	26.6
Do not know	9	3.7
Reduction of HIV transmission by not having sex at all		
Yes	172	71.4*
No	60	24.9
Do not know	9	3.7

*Correct response for assessment of comprehensive knowledge of HIV and AIDS

4.6. Personal HIV risk perception and HIV risk reduction strategies used in prison

The results relating to personal HIV risk perception among female prisoners showed that for risk in general/before imprisonment, 45% of the female prisoners reported that they perceived themselves to be at no risk of getting HIV, 51% perceived themselves to be at low risk and only 4% perceived themselves to be at high risk. In addition, only 3% indicated that they perceived themselves to be at no risk or no chance of getting HIV in prison while majority (54%) thought that they had a high risk of HIV infection in prison. Additionally, only 3% estimated that among every 2 female prisoners, 1 had HIV; 37% indicated that among every 5 female prisoners, 1 had HIV; 46% estimated that among every 10 female prisoners, 1 had HIV while 8% reported that among every 25 female prisoners, 1 had HIV.

In addition, coping strategies to prevent HIV infection in prison among female prisoners were assessed. The results showed that majority (73%) reported that they did not share sharp equipment such as razor blades and needles with other prisoners and 1% indicated that they abstained from sex. It is interesting to note that as many as 25% reported that they did "nothing" to reduce the risk of HIV infection while in prison. Table 4.10 describes female prisoners in terms of personal HIV risk perception and HIV risk reduction strategies used in prison.

Table 4.10: Personal HIV risk perception and HIV risk reduction strategies used in prison

Variable	Frequency (N=241)	Percent
Chance of getting HIV before imprisonment		
At no risk	108	44.8
At low risk	124	51.4
At high risk	9	3.7
Chance of getting HIV in prison		
At no risk	8	3.3
At low risk	104	43.2
At high risk	129	53.5
HIV estimates in this prison		
one inmate out of two	8	3.3
one inmate out of five	89	37.0
one inmate out of ten	110	45.6
one inmate out of twenty-five	20	8.3
Other	14	5.8
HIV risk reduction strategies used in prison		
Do not share razor blades and needles	175	72.6
Abstain from sex	2	0.8
Other (do not share personal things like toothbrushes, drinking cups, etc)	5	2.1
Nothing	59	24.5

4.7. Relationship between comprehensive knowledge of HIV/AIDS and socio-demographic characteristics and prison environment

This section presents the results from a bivariate analysis conducted to assess the relationship between comprehensive knowledge of HIV/AIDS and socio-demographic characteristics and prison environment. The results indicated that there was no statistically significant association between comprehensive knowledge and age (p=0.132). However, comprehensive knowledge of HIV/AIDS increased with age except those in the age group 50 years and above. Generally, there was a statistically significant association between level of education and comprehensive knowledge of HIV/AIDS (p=0.026). Comprehensive knowledge of HIV/AIDS increased with level of education (high school= 21% and college/university=37%). This means that the higher the educational level of a respondent, the higher their level of comprehensive knowledge of HIV/AIDS. However, primary level of education did not follow this trend.

Furthermore, the results showed that there was no statistically significant association between comprehensive knowledge of HIV/AIDS and religion (p=0.471). However, none of the female prisoners who were traditionalists/spiritualists had comprehensive knowledge of HIV/AIDS.

There was a statistically significant association between country of residence and comprehensive knowledge of HIV/AIDS (p<0.01). Generally, female prisoners who were foreigners had comprehensive knowledge of HIV/AIDS compared to female prisoners who were Ghanaians. In addition, comprehensive knowledge of HIV/AIDS increased with length of stay in prison except for prisoners who had stayed for 3 years and above. However, this association was not statistically significant (p=0.710). The results are displayed in Table 4.11.

Table 4.11: Relationship between comprehensive knowledge of HIV/AIDS and socio-demographic characteristics and prison environment

Variables	Comprehensive Knowledge (N=241)			*P*- value
	Comprehensive knowledge	No Comprehensive Knowledge		
Age (years)				0.132
20-29	14.5	85.5	83	
30-39	20.0	80.0	80	
40-49	25.5	74.5	47	
50+	6.5	93.5	31	
Education				**0.026**
No education	14.1	85.9	99	
Primary	7.7	92.3	39	
High school (JSS/SSS)	21.4	78.6	84	
College/University	36.8	63.2	19	
Religion				0.471
Christian	18.8	81.2	154	
Muslim	17.3	82.7	75	
Traditionalist/Spiritualist	0.0	100.0	12	
Country of residence				**0.006**
Ghana	14.7	85.3	204	
Foreign	22.7	77.3	37	
Length of stay in prison				0.710
Less than 1 year	15.8	84.2	139	
1-3years	20.7	79.3	53	
3 years and above	18.4	81.6	49	

4.8. HIV risky behaviour in prison by selected variables

This section presents the results from a bivariate analysis conducted to assess the association between HIV risky behaviour of potentially HIV negative female prisoners and some selected variables of interest. 42% of female prisoners engaged in low HIV risky behaviour while 58% engaged in high HIV risky behaviour in prison. The results show that there was no statistically significant association between HIV risky behaviour in prison and age (p=0.172). However, high HIV risky behaviour in prison was reduced as age increased. There was a statistically significant association between HIV risky behaviour in prison and level of education (p=0.022). Generally, high HIV risky behaviour was reduced with higher level of education except for primary level of education which did not follow this trend.

In addition, there was a statistically significant association between HIV risky behaviour in prison and religion (p=0.046). Female prisoners who were Muslims engaged in high HIV risky behaviour as compared to Christians or traditionalists/spiritualists. There was no statistically significant association between HIV risky behaviour in prison and marital status (p=0.219). However, female prisoners who had never been married and those who were either divorced/separated engaged in high HIV risky behaviour in prison compared to female prisoners who were married or widowed.

Moreover, there was no statistically significant association between HIV risky behaviour in prison and length of stay in prison (p=0.764). However, female prisoners who had stayed in prison for less than 1 year engaged in high HIV risky behaviour compared to those who had stayed in prison for 1 to 3 years or prisoners who had stayed in prison for 3 years and above.

Table 4.12: HIV risky behaviour of female prisoners by selected variables

Variables	HIV risky behaviour		N = 241	*p*- value
	Low- risk behaviour	High-risk behaviour		
Age groups (years)				0.172
20-29	39.8	60.2	83	
30-39	41.3	58.7	80	
40-49	48.9	51.1	47	
50+	61.3	38.7	31	
Education				**0.022**
No education	36.4	63.6	99	
Primary	35.9	64.1	39	
High school (JSS/SSS)	55.9	44.1	84	
College/University	57.9	42.1	19	
Religion				**0.046**
Christian	49.4	50.6	154	
Muslim	32.0	68.0	75	
Traditionalist/Spiritualist	66.7	33.3	12	
Marital status				0.219
Never Married	40	60	115	
Married	50.7	49.3	69	
Divorced/Separated	39.5	60.5	38	
Widowed	61.1	38.9	19	
Length of stay in prison				0.764
Less than 1 year	43.2	56.8	139	
1-3 years	49.1	50.9	53	
3 years and above	44.9	55.1	49	

4.9. Personal HIV risk perception of female prisoners by selected variables

This section presents the results from a bivariate analysis conducted to assess the association between female prisoners' personal HIV risk perception inside prison and some selected variables of interest.

In relation to HIV risk perception in prison by selected variables, the results revealed that there was a statistically significant association between personal HIV risk perception in prison and age (p=0.026). Generally, female prisoners who were older perceived a low HIV risk in prison except for those who were in the age group 30-39 years. There was no statistically significant association between personal HIV risk perception in prison and level of education (p=0.408). However, all female prisoners who completed primary education perceived a high HIV risk in prison.

In addition, there was statistically significant association between perceived risk in prison and marital status (p<0.01). It can be seen that female prisoners who were never married had a high HIV risk perception in prison. There was a statistically significant association between perceived risk in prison and HIV risky behaviour in prison (p< 0.001). All female prisoners who engaged in HIV risky behaviour in prison perceived a high HIV risk in prison. The results are shown in table 4.13.

Table 4.13: Personal HIV risk perception of female prisoners by selected variables (N=241)

Variables	Perceive no HIV risk in prison	Perceive HIV risk in prison	*P*-value
Age groups (years)			**0.026**
20-29	2.5	97.5	
30-39	1.3	98.7	
40-49	4.4	95.6	
50+	10.3	89.7	
Education			
No education	2.1	97.9	0.408
Primary	0	100	
High school	6.3	93.7	
College/University	5.3	94.7	
Marital Status			**0.003**
Never married	1.8	98.2	
Married	2.9	97.1	
Divorced/Separated	2.7	97.3	
Widowed	17.6	82.4	
HIV risky behaviour in prison			**0.000**
No HIV risky behaviour	7.8	92.2	
Risky behaviour	0	100	

4.10. Impact of education and religion on HIV risky behaviour in prison (Multivariable analysis N=241)

This section presents the results of a multivariable analysis that was conducted to examine the impact of educational level and religion (independent variables) on HIV risky behaviour in prison (dependent variable). When the logistic regression was carried out in relation to the independent variables associated with HIV risky behaviour in prison, it was noticed that only educational level (high school) retained it's significance.

The results showed that there was a protective given that a female prisoner had no education, a female prisoner with high school education was 0.46 times less likely to engage in HIV risky behaviour in prison. This relationship was statistically significant (OR=0.46, *p*=0.016, 95% CI 0.24-0.86). Additionally, given that a female prisoner had no education, a female prisoner with college/university education was 0.45 times less likely to engage in HIV risky behaviour in prison eventhough this relationship was not statistically significant (OR=0.45, *p*= 0.132, 95% CI 0.16-1.27).

Moreover, given that a female prisoner was a Christian, a female prisoner who was a Muslim was 1.64 times likely to engage in HIV risky behaviour in prison eventhough this relationship was not statistically significant (OR=1.64, *p*=0.117, 95% CI 0.88-3.03). Furthermore, given that a female prisoner was a Christian, a female prisoner who was a traditionalist/spiritualist was 0.34 times less likely to engage in HIV risky behaviour in prison eventhough this relationship was not statistically significant (OR=0.34, *p*=0.150, 95% CI 0.08-1.48). The results of the multivariable analyses are presented in table 4.14.

Table 4.14: Impact of education and religion on HIV risky behaviour in prison (Multivariable analysis N=241)

Variables	Odds ratio	*p*- value	95% CI
Education			
No education (Reference)			
Primary	0.99	0.99	0.46 – 2.21
High School	0.46	**0.016**	0.24 – 0.86
College/University	0.45	0.132	0.16 – 1.27
Religion			
Christian (Reference)			
Muslim	1.64	0.117	0.88 –3.03
Traditional/Spiritualist	0.34	0.150	0.08 – 1.48

4.11. Impact of HIV risky behaviour in prison, marital status and age on personal HIV risk perception in prison (Multivariable analysis N=241)

This section presents results of multivariable analysis conducted to assess the impact of HIV risky behaviour, marital status and age (independent variables) on personal HIV risk perception in prison (dependent variables). The above independent variables were all statistically significant at the bivariate level. However, the results showed that only HIV risky behaviour was highly correlated with personal HIV risk perception in prison.

The results indicated that given that a female prisoner did not engage in HIV risky behaviour, a female prisoner who had engaged in HIV risky behaviour was 2.81 times likely to perceive herself of being at risk for HIV infection in prison. This relationship was statistically significant (OR=2.81, $p<0.001$, 95% CI 1.57-5.01). For marital status, given a female prisoner who had never

married, a female prisoner who was married was 0.68 times less likely to perceive herself as being at risk for HIV infection in prison even though this relationship was not statistically significant (OR=0.68, *p*=0.329, 95% CI 0.31-1.48).

Furthermore, given a female prisoner who had never married, a female prisoner who was divorced/separated was 1.14 times likely to perceive herself of being at risk for HIV infection in prison even though this relationship was not statistically significant (OR=1.14, *p*=0.788, 95% CI 0.44 -2.95). In addition, given a female prisoner who had never married, a female prisoner who was widowed was 1.19 times likely to perceive herself of being at risk for HIV infection in prison even though this relationship was not statistically significant (OR=1.19, *p*= 0.801, 95% CI 0.31-4.64).

Additionally, given a female prisoner who was between the ages of 20 and 29 years, a female prisoner who was in the age group 30-39 years was 0.96 times less likely to perceive herself of being at risk for HIV infection in prison even though this relationship was not statistically significant (OR=0.96, *p*=0.928, 95% CI 0.44-2.10).

In addition, given a female prisoner who was in the age group 20 and 29 years, a female prisoner who was in the age group 40-49 years was 0.38 times less likely to perceive herself of being at risk for HIV infection in prison even though this relationship was not statistically significant (OR=0.38, *p*=0.061, 95% CI 0.14-1.05). Moreover, given a female prisoner who was between the ages of 20 and 29 years, a female prisoner who was 50 years or above was 0.81 times less likely to perceive herself of being at risk of HIV infection in prison even though this relationship was not statistically significant (OR=0.81, *p*= 0.700, 95% CI 0.27-2.41). The results of the multivariable analysis are presented in table 4.15.

Table 4.15: Impact of HIV risky behaviour in prison, marital status and age on personal HIV risk perception in prison (Multivariable analysis N=241)

Variables	Odds ratio	p- value	95% CI
HIV risky behaviour in prison			
No HIV risky behaviour (Reference)			
Engaged in HIV risky behaviour	2.81	**0.000**	1.57 – 5.01
Marital status			
Never married (Reference)			
Married	0.68	0.329	0.31– 1.48
Divorced/ Separated	1.14	0.788	0.44 – 2.95
Widowed	1.19	0.801	0.31 – 4.64
Age groups (years)			
20-29 (reference)			
30-39	0.96	0.928	0.44 – 2.10
40-49	0.38	0.061	0.14 – 1.05
50+	0.81	0.700	0.27 – 2.41

4.13. Summary of the chapter

This chapter has outlined the results obtained after analysing the questionnaire data. The chapter has shown that most of female prisoners in Ghana had ever tested for HIV with HIV prevalence among female prisoners being 31%, and therefore the majority of female prisoners in Ghana were considered as potentially HIV negative in this study. With respect to their socio-demographic characteristics most of the female prisoners were less than 40 years of age with a high level of literacy. It was also shown that the majority of female prisoners had never been married and more than half of those who had tattoos before imprisonment had acquired more tattoos in prison.

In addition, the chapter revealed that sharing of tattooing equipment and razor blades was a common practice in prison. However, drug injection use was not common among female prisoners in Ghana. Indeed, penetrative sex with other prisoners or prison staff was rare while HIV/AIDS awareness was universal among female prisoners. The level of comprehensive knowledge of HIV/AIDS transmission and prevention was low. Accordingly, the prevalence of misconceptions of HIV transmission and prevention was high. Most of the female prisoners were fearful of getting HIV in prison. The majority of the female prisons were educated on HIV/AIDS in their respective prisons while only a few were aware of HIV treatment being offered to inmates in prison.

About one-fourth of the female prisoners 'did nothing' to reduce their risk of getting HIV in prison. In contrast, results showed that most female prisoners engaged in high HIV risky behaviour in prison while those who had had high school education were less likely to engage in HIV risky behaviour in prison. Furthermore, it was observed that female prisoners who engaged in HIV risky behaviour in prison were likely to perceive a high risk of getting HIV in prison. The next chapter presents the discussion of the findings in relation to existing literature.

CHAPTER FIVE

DISCUSSION OF FINDINGS

5.0. Introduction

This chapter presents a discussion of the descriptive and analytical results to address the research questions of this study and their relationship with existing literature. Section one presents the socio-demographic and prison characteristics of female prisoners. Section two presents HIV testing of female prisoners. Section three presents HIV-related risk behaviours among female prisoners. Section four presents female prisoners and availability of HIV-related health facilities.

Section five presents comprehensive knowledge of HIV/AIDS transmission and prevention among female prisoners. Section six presents personal HIV risk perception among female prisoners and HIV risk reduction strategies used in prison. Section seven presents the coping strategies to prevent HIV infection among female prisoners. Section eight presents HIV risky behaviour of female prisoners and selected variables. Section nine presents the implications of current research in a wider context. Section ten presents the summary of the chapter.

5.1. Socio-demographic and prison characteristics of female prisoners

This section presents analysis of the descriptive analysis of the socio-demographic characteristics of the female prisoners in this study and their relationship with existing literature. It would be recalled that earlier researchers had intimated that access to quality healthcare among female prisoners of the Kumasi Central Prisons was poor and demographic characteristics (marital status, educational background and occupation) influenced inmates' perception of accessibility to quality healthcare (Sarpong *et al*., 2015). Due to the influence of socio-demographic characteristics on any assessment among female prisoners, this study also evaluated the extent to which this variable accounted for the responses obtained in this current study. The individual characteristics measured have been presented below.

In general, the study found that 34% of potentially HIV negative female prisoners were less than 30 years while 33% were in the age group 30-39 years. This finding reflects the comparatively

young age structure of female prisoner population in Ghana (see Sarpong *et al*., 2015). Another study found that most prisoners (30%) were between the ages of 18 and 25 years with a mean age of 33.8 (SD±14.42) in Port Harcourt, Nigeria (Nwaopara & Stanley 2015) which was close to the findings in this study.

Quarshie *et al*. (2018) explored some of the key characteristics of multiple perpetrator rape (MPR) in Ghana as reported in the media and found that the average victim's age was 17.9 years. However, this current study also found that the mean age of the respondents was 35.9%. This could be explained by the reality that this study assessed only female prisoners from age 18 years and above while the other study examined all female victims and all male perpetrator groups on two different issues. These age groups are usually the sexually active group in society and it is expected that they would be more aggressive when it comes to sexual relationships (Kalra, Subramanyam & Pinto, 2011). Therefore, the argument of other researchers is that this poses grave concern when it comes to HIV transmission and other risk behaviours sometimes due to their low educational attainment (Dwyer *et al*., 2011).

Adinkrah (2018) studied demographic characteristics of matricidal acts that occurred between 1990 and 2016 in Ghana which suggested that there was the need to examine other socio-demographic characteristics in this study. Indeed, some researchers note that in many cases, incarcerated women are low-income and have limited education and sporadic employment histories (Dwyer *et al*., 2011; Aaltonen, 2016). This study found that while a high proportion (35%) of female prisoners had attained high school education, the proportion of female prisoners who had had 'no formal education' was very high (41%) as well. Similar findings have been reported in the literature where 28.5% of the study population of female prisoners in Kumasi Central Prisons, Ghana, had no formal education (Sarpong *et al*., 2015). Considering these findings, it could be argued that, in most cases, female prisoners in Ghanaian prisons are people with low educational attainment (Mfum, 2012; Ibrahim, Esena, Aikins, O'Keefe & McKay, 2015).

In addition, it could be proposed that most females are incarcerated for trivial issues due principally to their low level of education. A study found that most female prisoners had low educational

levels and had committed minor, non-violent offences such as not paying a fine, theft or fraud before their imprisonment in Berlin, Germany (Mundt, Kastner, Mir & Priebe, 2015). This is supported by another study which reported that all the female prisoners had a low educational level as 61.1% had no qualifications (meaning no high school diploma) in Switzerland (Handtke, Bretschneider, Elger & Wangmo, 2015). Like the findings in the study, a study found that 49% of prisoners had no formal education while 28% had primary education and 15% had post-secondary education in a Port Harcourt prison in Nigeria (Nwaopara & Stanley, 2015). Contrarily, a study reported that all inmates had attained, at least, primary school education before incarceration in Kaduna State, Nigeria (Audu *et al*., 2013).

One other crucial characteristic among the prisoners which was associated with young age was their marital status. That is, most female prisoners (48%) in this study had never been married, with only 29% being married. Similar findings have been reported in the literature where 28.5% of the study population of female prisoners in the Kumasi Central prisons, Ghana, were single with about a third (29.0%) being married (Sarpong *et al*., 2015). Internationally, other studies among female prisoners found that 52.5% of the study population were unmarried in Greece (Geitona & Milioni, 2016). Contrarily, other studies posited that female prisoners have married before their incarceration (Aborisade & Fayemi, 2016). Aborisade and Fayemi (2016) found that majority of female prisoners (34%) were married in Nigeria. These findings on the marital status of the female prisoners could serve as a source of motivation or demotivation for them to endure their sentences.

In relation to their conviction, the study found that a higher proportion (76.3%) of female prisoners were trialled and sentenced. This could be attributed to the Justice for All Program (JFAP) that was instituted in Ghana in 2007 (Brobbey, 2011; Agyemfra, 2016). The Justice for All Program (JFAP) is an initiative of the Office of the Attorney-General and Ministry of Justice, introduced to help promote access to justice and for speedy trial of cases of remand prisoners. This initiative has resulted in a significant reduction of remand prisoners; from 40% in 2007, when it was launched, to 13.4% in 2019 (POS Foundation, 2020). A similar finding was reported in a survey in the Kumasi Central Prisons, Ghana (Sarpong *et al*., 2015).

This finding contradicts the findings of a study in Nigeria where there were more remand than convicted prisoners (Nwaopara & Stanley 2015). Nwaopara and Stanley (2015) argued that out of a total prison population of 3,000, 144 were convicts (140 males, 4 females) while 2600 were awaiting trial. Another study found that majority (81.25%) of female prisoners were still awaiting trial while only 18.8% of them had had their cases concluded in Nigeria (Aborisade & Fayemi, 2016). Similarly, a study found that more than half (58.4 %) of female prisoners were pre-trial prisoners in Greece (Geitona & Milioni, 2016)

In addition, with regards to length of stay in prison, this study found that majority (58%) of female prisoners had been in the prison for less than a year. Contrarily, a study found that the mean time spent in prison for elderly female prisoners was 3.6 years in Switzerland (Handtke, Bretschneider, Elger & Wangmo, 2015). The difference could be attributed to the youthful age of respondents in this study compared with the elderly age of the respondents in the study conducted in Switzerland.

In a related analysis, the number of times of imprisonment (whether a first time, among others) among the female prisoners was assessed and the study revealed that an overwhelming majority (96%) had never been imprisoned apart from their current sentence. Similarly, a study found that 83.2% of female prisoners were serving their first incarceration in Greece (Geitona & Milioni, 2016). Generally, it could be argued that the above findings were due to the reality that many women are sent to prison to serve a sentence for theft than for violence against a person, robbery, sexual offences, fraud, drugs and motoring offences combined, hence, the reason why women serve short prison sentence (Prison Reform Trust, 2017).

5.2. HIV testing for female prisoners

Sarpong *et al*. (2015) suggested the need for inmates to be encouraged to be proactive in seeking healthcare irrespective of their background characteristics. In this respect, this current study assessed whether the female prisoners had ever been tested for HIV before the study period. This study found that 73% of the female prisoners had ever tested for HIV before this survey. Out of this proportion, 31% tested positive for HIV and 2% did not know of their HIV results/status after

the HIV test. Similar findings were reported in a multicenter study in Ghana where the prevalence of HIV and syphilis in female prisoners was reported to be 15.1 and 36.1 respectively (Adjei *et al*., 2008). Another study found that the HIV prevalence was 19·2% among 281 inmates in Ghana (Adjei *et al*., 2006; Golrokhi *et al*., 2018). The only difference between these two Ghanaian studies was that the earlier study also assessed the HIV status in addition to other infectious diseases (Adjei *et al*., 2008).

The most recent HIV prevalence in the general Ghanaian population was 1.7% with regional variations as of 2018 (Ali *et al*., 2019; Atuahene, 2020). Similarly, the most recent HIV prevalence among prisoners in Ghana was 2.3% as of 2014 (Ghana Aids Commission (GAC), 2014; Ali *et al*., 2019). Comparatively, the HIV prevalence rate among female prisoners in this study was high as compared to other studies among prisoners in Ghana (see Adjei *et al*., 2006; Ali *et al*., 2019; Golrokhi *et al*., 2018). This may be related to the fact that this study focused on all female prisoners in Ghana. Continentally, other studies have reported HIV prevalence among prisoners in Sub-Saharan Africa to vary from 2.3% to 34.9% among different regions (Telisinghe *et al*., 2016; Golrokhi *et al*., 2018).

In addition, the study found that while 23% of female prisoners had not been tested for HIV before this survey, 4% did not know whether they had ever been tested for HIV. Similarly, a study showed that 45% of prisoners had never been tested for HIV previously; out of which 1.6% had tested positive for HIV – men (1.5%) and women (1.9%) in Brazil (Sgarbi *et al*., 2015). Sgarbi *et al*. (2015) confirmed the findings of this study by explaining that HIV testing rates among prison inmates were low and most HIV-infected inmates were unaware of their HIV diagnosis in Brazil.

In addition, several studies among prisoners have reported low testing rates (35%-84%) in other settings (Macgowan *et al*., 2009; Rodríguez-Díaz, Rivera-Negrón, Clatts & Myers, 2014).

Another study found that only 36.3 % of female prisoners had been tested for HIV and 42.6 % and 43.6 % for Hepatitis B and C respectively in Greece (Geitona & Milioni, 2016). The other argument was also that data on HIV among prisoners living in Sub-Saharan Africa and other

countries was scarce and those available were not appropriately accurate or not enough to provide a representation of the current situation (Golrokhi *et al*., 2018).

The other point of argument that the results of this study sought to posit was whether the prevalence of HIV among the female prisoners was due to their infected status before or during incarceration. Evidence available suggests the affirmative (Kivimets & Uusküla, 2014). For instance, a study among prisoners in Estonia reported that 15.6% were infected with HIV of which 8.3% were newly diagnosed on entry into prison (Spaulding *et al*., 2009; Kivimets & Uusküla, 2014). It has been argued that even though HIV transmission does occur in custody, most HIV-infected inmates are probably infected before entering prison (Spaulding *et al*., 2009; Kivimets & Uusküla, 2014).

Several factors have been reported to hinder prisoners' access to HIV testing including shortage of HIV test kits in Ghana (Ali *et al*., 2019). Ali *et al*. (2019) explained that this shortage is due to how these resources are provided, noting that provision of HIV test kits in Ghanaian prisons is mainly done by some non-governmental organisations (NGOs) and not the central government. Hence, prisoners are only tested for HIV when there is availability of HIV test kits in prisons (Ali *et al*., 2019). These findings demonstrate low adherence to WHO recommendations for voluntary HIV testing for all prisoners at the time of incarceration and critical need to implement routine testing programmes in prison environments (World Health Organisation (WHO), 2013; Sgarbi *et al*., 2015).

Sgarbi *et al*. (2015) confirmed that these findings underscore the continued gap in HIV services for the prisoner population. In view of the above challenges, it has been suggested that there is the need to devise strategies to ensure that routine testing is conducted for prisoners, especially female prisoners (Kivimets & Uusküla, 2014). Kivimets and Uusküla (2014) contended that routine HIV testing on entry for prisoners helps to identify newly diagnosed cases while previously known cases can be referred for treatment. This is to support the notion that early diagnosis of HIV infection provides an opportunity to improve public health and patient health outcomes (Kivimets & Uusküla, 2014).

5.3. HIV-related risk behaviours among female prisoners

There are several aspects of pre-incarceration behaviour which place prisoners at high risk for HIV infection (Adams *et al*., 2013). Adams *et al*. (2013) argued that the potential that pre-incarceration risk-taking would continue after incarceration also exists in the absence of effective intervention programmes and policies. To establish this point, this study examined the HIV-related risk behaviours among the female prisoners and found that some of the HIV-related risk behaviours existed before and during imprisonment. For example, on the issue of before incarceration, this study found that moderate levels (26%) of tattooing/piercing occurred before imprisonment. Similarly, moderate levels (27%) of tattooing before imprisonment were found among prisoners in Azerbaijan (Azbel *et al*., 2015).

With specific reference to female prisoners, other studies found that female prisoners reported lower levels (36.1%) of tattooing before imprisonment in Iran (Nokhodian *et al*., 2012; Moazen *et al*., 2018). Additionally, it could be observed that finding lower levels have been consistent in Iran as another study concluded that a low level (5.3%) of tattooing was found among general prisoners (Roshanfekr, Farnia & Dejman, 2013; Moazen *et al*., 2018). Other studies found that body piercing/tattooing was largely uncommon among female inmates (Abiona *et al*., 2009; Kluger, 2015).

On the contrary, on the issue of tattooing/body piercing during incarceration, this study found that moderate levels (29%) of tattooing/piercing occurred within the prison. In contrast to the moderate levels, a higher level of tattooing (60%) was found among prisoners who had secretly had tattoos in prison (Tran *et al*., 2018). In addition, other researchers reported high prevalence of tattooing and piercing or other body-modification practices in prison (Moazen *et al.,* 2018). Notably, this study found that more than half (51%) of female prisoners who had tattooed before imprisonment had acquired more tattoos inside prison. This could be attributed to the socio-cultural underpinnings of the country where tattooing is being considered an adorable fashion (Avenorgbo, 2008; Yang, 2018).

Similarly, a study found that more than 60% of inmates had acquired more tattoos in a Puerto Rican prison (Kamarulzaman *et al*., 2016). Another study found that even Hepatitis C Virus (HCV) infected prisoners got additional tattoos during incarceration in Mexico (Belaunzarán-Zamudio, *et al*., 2017). Therefore, this finding of the study highlights the crucial association between pre-incarceration behaviours and the continuation of these HIV-related risk behaviours in prison (Kamarulzaman *et al*., 2016).

Literature argues that, in most instances, prisoners share tattooing equipment and razor blades; an idea which was put to test in this study (see Yang, 2018). Consequently, this study found that sharing of tattooing equipment (98.6%) and razor blades (41.5%) was a common practice in prison. Similar evidence suggests that even Hepatitis C Virus (HCV) infected prisoners often shared tattooing materials than the HCV non-infected prisoners during incarceration in Mexico (Belaunzarán-Zamudio *et al*., 2017).

Even as there was evidence of sharing of such equipment and materials, the public health challenge is the cross infection due to a seeming absence of quality healthcare provision in most prisons. This view was confirmed in other studies which found that even though the sharing of materials or equipment used for tattoos, piercings and razor blades was a common practice among prisoners. Cleansing agents were not readily available (Silva *et al*., 2019; Abiona, Balogun, Adefuye & Sloan, 2010; Abiona, Balogun, Adefuye & Anguh, 2015). This perspective has been confirmed in earlier studies that tattooing and body piercing practices exist in West African prisons and could constitute risks for transmission of HIV. Ghanaian prisons are no exception (Abiona, Balogun, Adefuye & Sloan, 2010; Abiona, Balogun, Adefuye & Anguh, 2015).

Apparently, the public health challenge could be heightened if the prisoners were not aware of the fact that the equipment or materials for tattooing and piecing had been applied before. This point is buttressed by a study which found that the proportion of prisoners that reported receiving tattoos with previously used materials or did not know whether the material had already been used was very high (50%) in a state prison system in Mexico (Belaunzarán-Zamudio, *et al*., 2017). In the prison setting, it is important to highlight basic interventions to reduce or stop sharing and reuse

of equipment for tattooing and other forms of skin penetration, as recommended by UNAIDS/UNODC (UNODC, 2012; Belaunzarán-Zamudio, *et al*., 2017).

Another HIV-related risk behaviour that was considered in this study was injection drug use (IDU). This study found that low levels (5%) of IDU were reported to have happened both before imprisonment and in prison. Similar to this finding, a study among incarcerated men reported that injection drug use in the 3 months before incarceration was 8.9% in the USA (Golin, Barkley, Biddell, Wohl & Rosen, 2018). Similarly, Sgarbi and colleagues found that intravenous drug use was largely uncommon (0.9%) in Brazil (Sgarbi *et al*., 2015).

Similarly, other researchers found low levels of injection drug use (IDU) in prisons in selected African geographical regions (i.e., East and Southern Africa and West and Central Africa) (da Rosa *et al*., 2012; Moazen *et al*., 2018). In addition, a survey conducted in three state prisons found that 10% of inmates were IDUs in Brazil (Francisco, 2009; Sgarbi *et al*., 2015).

Contrarily, many studies have reported high levels of injection drug use among female prisoners, especially in Canada (DiCenso, Dias & Gahagan, 2003; Martin *et al*., 2005; Jürgens *et al*., 2011). In addition, a study found that prisoners (43.2%) reported having ever injecting drugs and smoking heroin in Ireland (Golrokhi *et al*., 2018).

Another issue that was relevant following the observation of injection drug use among the female prisoners was the historical background to this behaviour. This study found that 75% of female prisoners who had injected drugs before imprisonment continued to inject drugs inside prison. Nevertheless, some researchers also argued that many drug users stopped using and injecting drugs when imprisoned and other prisoners began to use drugs or would switch the route of drug administration if their preferred drug was unavailable (Fazel *et al*., 2006; Dolan *et al.*, 2015).

Generally, injection drug use is a common practice for prisoners who indulged in such practice before their imprisonment and this has contributed to the high HIV prevalence among prisoners (Golrokhi *et al*., 2018). These findings may agree with other prison settings where injection drug use remains an important factor in HIV infection among inmates (Moazen *et al*., 2018). This

finding could be attributed to the argument that prisons were also places where drug use was initiated, often to release tension and to cope with being in an overcrowded and, often, a violent environment (Chu & Peddle, 2010; Jürgens *et al*., 2011).

This study noted that among the 5% of respondents who injected drugs in prison, there were higher levels (100%) of needle sharing among the female prisoners. Thus, the results on the history of shared IDU/needles before imprisonment was high (67%) in this study. Similarly, all inmates living with HIV had shared injecting equipment inside a prison in Scotland (Taylor *et al*., 1995; Golrokhi *et al*., 2018). Literature found that over half (56%) of participants in a study reported previous within-prison drug injection (WP-DI) of which 93% shared injection equipment in prison and 78.6% estimated sharing needles with more than ten (10) other prisoners (Culbert *et al*., 2015). In addition, a systematic study found that 70.5% of injection drug users reported sharing needles while they were in prison (Golrokhi *et al*., 2018).

Associated with this problem of sharing injection drug equipment among prisoners was infection as a result of lack of proper treatment of such equipment. For instance, a study found that in the absence of sterilised injecting equipment, women, like men, injected with either used needles or home-made syringes in Australia (Walker, Seear, Higgs, Stoové & Wilson, 2019). Similarly, a study found that women were more likely than men to report using dirty needles at all time (Adams *et al*., 2013).

Other HIV-related risk behaviours that could be adopted in prison are sexual violence and high-risk sexual behaviour. Nonetheless, documents have revealed that the prevalence of sexual activity in prisons was largely unknown and believed to be significantly underreported due to denial, fear of stigma and homophobia and the criminalisation of same-sex conduct in some jurisdictions (Joint United Nations Program on HIV/AIDS (UNAIDS), 2015; Avert, 2020). This study found that majority (64%) of female prisoners admitted that they had had casual sex partners before their imprisonment. Sgarbi and colleagues reported similar findings where half of prisoners (50%) reported that they had not had a regular sex partner (meaning they had had casual sex partners) in Brazil (Sgarbi *et al*., 2015).

Additionally, this study found that 20% reported to have had multiple casual sex partners in the year before the survey and 76% (out of the 20% who had had multiple casual sex partners) had "never used" a condom with their casual sex partners in the last 12 months. Contrarily, a study among adult inmates in Osun State Prison, Nigeria found that while 54.6% had had multiple sexual partners before incarceration, 23.3% of them had always used a condom (Olugbenga-Bello, Adeoye & Osagbemi, 2013). The lack of use of condoms in sexual relationships has been reported to be common among incarcerated people. The story is similar among both male and female prisoners. A similar finding of the high non-use rate of condoms in both main and casual sex relationships was reported among rural African American men where 84% of main partners and 49% of casual partners reported inconsistent use of condoms (Hicks, Kogan, Cho & Oshri, 2017).

In most settings in Africa, people who are incarcerated become vulnerable and preyed upon by people in authority or even peers (Kamarulzaman *et al*., 2016; Avert, 2020). Therefore, it was not surprising that sex between the opposite sex was reported by female prisoners in this study. That is, low levels (12%) of penetrative sex with other inmates or prison staff were reported to have occurred during imprisonment. Similar to this finding, a review conducted between 2007 and 2017 reported that low levels of sexual activity in prison (both consensual and non-consensual) took place in Europe and North America (about 12% of prisoners) and West and Central Africa (about 14%) while prisoners were less likely to be sexually active (1.5%) in the Middle East and North Africa (Moazen *et al*., 2018; Avert, 2020).

This could also be explained by the differences in the level of desire for sexual relationship among both male and female prisoners (Nugrahani *et al*., 2018). Nugrahani *et al*. (2018) in a systematic study reported that unlike women who experienced a decrease in sexual desire, male prisoners tended to continue to have these desires. This is confirmed by another study which found that sexual behaviour between female and male prisoners was that while 46% of male prisoners had actively engaged in sexual activity, 44% of female detainees had performed sexual activity during imprisonment (Rowell-Cunsolo *et al.,* 2016). Another study conducted among incarcerated men found that few (1.5%) reported having had sex with men or with both men and women in prison in the USA (Golin *et al*., 2018).

A contrary finding has been reported where none of the female inmates had had sexual intercourse with the opposite sex while 1.4% had had same sex partners in prison in Nigeria (Olugbenga-Bello *et al*., 2013). Olugbenga-Bello *et al*. (2013) explained further that this was because sexual exposure to the opposite sex was difficult because the cells were gender specific and this prevented them from engaging in sexual relationships with the opposite sex. The difference between the findings of this study and that of the Nigerian study could be due to the structural arrangements in the prisons. Whereas both female and male prisoners are located within the same environment or compound in Ghana, this was not the case in Nigeria. For example, the Tamale Central Prisons in Ghana is structured such that the females enter their compound through the male's compound.

In other settings outside Africa, a history of homosexual intercourse has been reported more commonly among women (24%) than men (5%), for instance, in Brazil (Sgarbi *et al*., 2015). This contradicts the findings of this study where homosexuality was not common among the female prisoners. This difference could be explained based on the socio-cultural variations between continents. For instance, while homosexuality may be accepted in other cultures, this act is frowned upon in many of the countries in Africa, especially Ghana (Laar & DeBruin, 2017).

In addition, it was necessary to establish whether condoms were used during sexual relationships in prison. This study found that there was a low level (8%) of condom use during recent sex in prison. Contrary to this finding, a study showed that 14.9% of inmates reported having sexual intercourse in prison out of which 43.8% claimed to have used condoms regularly in Kaduna, Nigeria (Sabitu, Iliyasu & Joshua, 2009; Olugbenga-Bello *et al*., 2013).

Additionally, condom use was reported to be irregular among 66% of inmates in Brazil (Sgarbi *et al*., 2015). Similarly, a survey found that about 7% were reported to have had sex without a condom in prison with other prisoners and around 3% admitted to being coerced into sexual acts in Australia (Avert, 2020). The argument regarding HIV-related risk behaviours (sexual risk behaviour in prison) is that sexual activities are often forbidden in prisons. With some believing that the provision of condoms condones such behaviours, it could mean that the lack of such preventive measures could lead to an increase in HIV infection when inmates decide to engage in sexual acts without a condom (Avert, 2020).

As intimated earlier, the vulnerability among prisoners could expose them to sexual risk behaviours as they have unmet needs. Thus, another interesting finding of this study was that 79% of the female prisoners had ever received money or goods for sex while in prison. Similarly, other studies had reported that sex was being exchanged for food, sleeping space and commodities in other African countries (Kamarulzaman *et al*., 2016; Avert, 2020).

In addition, a review found that women prisoners in Sub-Saharan Africa were at 'extreme risk' of physical abuse by other female prisoners and by police and prison officials (Van Hout & Mhlanga-Gunda, 2018). Similar evidence was reported in a study where 22% of female inmates reported that they had been subjected to prisoner-on-prisoner sexual victimisation (most often abusive sexual contact such as inappropriate touching) and, at least, 8% of female inmates had been exposed to one type of staff-on-prisoner sexual victimisation in the last 6 months in USA (Wolff, Blitz & Shi, 2007; Strathdee *et al*., 2015). Another study confirmed that 14 % of female prisoners had been sexually abused before detention in Greece (Geitona & Milioni, 2016).

It could be argued that despite the low level of unsafe sexual activity reported in this study, there was the possibility that most female prisoners might have been exposed to HIV-related risk behaviours before they were imprisoned, similar to what has been documented in literature (Reyes, 2000; Abiona *et al*., 2009). Penetrative sex between female prisoners and other inmates or prison staff could be related to an act of rape but not captured by prison authorities. This point of view is supported by an earlier suggestion that although rape in prison has been a longstanding concern, there was still relatively little known about its prevalence and contribution to HIV infection (Valera, Chang & Lian, 2017).

In the light of the above analysis, earlier researchers recommended that condom distribution programmes, accompanied by measures to prevent the occurrence of rape and other forms of non-consensual sex and needle and syringe programmes, should be adopted since they have proven to be effective at reducing HIV risk behaviours in a wide range of prison environments without resulting in negative consequences for the health of prison staff or prisoners (Jürgens *et al*. (2011).

It is important for prison authorities and stakeholders in the health sector, especially Ghana AIDS Commission, to consider the suggestions made here to be able to improve on prisoners' health.

5.4. Female prisoners and the availability of HIV-related services

This section presents a discussion of the results relating to the availability of HIV-related health services provided in female prisons in Ghana and their relationship with extant literature. Earlier studies have suggested that the prison environment does not only provide health services for HIV diagnosis among prisoners but also an opportunity for HIV prevention and treatment (Dolan *et al*., 2016; Golrokhi *et al*., 2018). This idea was examined in this study to confirm the availability or otherwise of HIV-related health facilities in female prisons in Ghana. The study found that majority (65%) of the female prisons reported that HIV services were offered in their respective prisons. Similarly, this finding has a relationship with a report which revealed that correctional facilities offer an opportunity to provide women with HIV testing and prevention services in USA (Fleming, LeBlanc & Reid, 2013).

Contrary to this finding, a systematic review showed that HIV health services for women were not adequately implemented within prison-based health services in Sub-Saharan Africa (van den Bergh, Gatherer & Møller, 2009; Van Hout & Mhlanga-Gunda, 2018). This seeming lack of implementation of prison-based health services in Sub-Saharan Africa has been explained by other researchers (Van Hout, & Mhlanga-Gunda, 2018). For instance, some researchers explained that the provision of low prison-based HIV services for women could be due to nurses lacking training in preventative medicine and insufficient clinical staff in prisons in Malawi, Tanzania, Swaziland, South Africa, Mauritius and Zimbabwe (Todrys, & Amon, 2012; Van Hout, & Mhlanga-Gunda, 2018).

Another angle to the challenge is the limited funding for HIV prevention services/activities and the lack of funding for appropriate training of correctional staff. These are important economic barriers to provision of prison-based HIV-related health services (Sumartojo, 2000; Strathdee *et al*., 2015). This explains why international organisations have advocated that prisoners and prison

staff need to be educated on HIV and AIDS and how to prevent its transmission, with special reference to the likely risks of transmission within prison environments and the needs of prisoners after their release (World Health Organisation (WHO), 2007; Avert, 2020). Specifically, it is important to consider the recommendation that makes efforts to reduce transmission rates and stigma. The burden of care for those living with HIV/AIDS in Ghana must integrate both preventative efforts and treatment action (Faria, 2008).

In addition, on the issue of HIV education for women prisoners, this study found that 65% reported that their prison offered HIV/AIDS education. This is similar to the findings of a systematic review that HIV education in terms of prevention was widely done in prisons (Dolan & Rodas, 2014; Golrokhi *et al*., 2018). Fleming *et al*. (2013) also confirmed this by reporting that HIV prevention activities for incarcerated women have focused on health education and behavioural interventions. Similarly, a systematic review indicated that nearly all the studies were concerned with educational programmes in prisons in USA (Valera, Chang & Lian, 2017). The high rate of HIV education as reported in this study could be attributed to the efforts of some non-governmental organisations (NGOs) and faith-based organisations that organise donations and provide education on all spheres of life to prisoners in Ghana (Faria, 2008).

Faria (2008) notes that discourses on such issues are shaped by an international politics of funding for HIV/AIDS that privileges prevention through behaviour change over treatment action under the premise that prevention is a more cost-effective option for the Global South (see Hushie, Omenyo, van den Berg & Lally, 2016). Hushie *et al*. (2016) suggested the need for commitment by the government and civil society organisations to work cooperatively in order to support the development and implementation of HIV/AIDS interventions in Ghana. It is believed that government's total commitment would enhance the educational efforts in prisons, especially for female prisoners.

Additionally, this study revealed that 61% of female prisoners were aware or had seen HIV testing been done in their respective prisons. Similar findings have been reported in prisons where there was compulsory or mandatory testing which required that all prisoners should have an HIV test

(UNODC, 2006; Avert, 2020). Contrarily, some researchers reported that close to a quarter of participants from a prison with compulsory testing did not report of receiving an HIV test, suggesting that they might not have been aware that an HIV test was performed (MacGowan *et al*., 2006).

On the other hand, other studies argued that though there was an opt-out HIV testing recommended for correctional settings, this might have occurred without inmates' knowledge or against their wishes (Rosen *et al*., 2015). Rosen *et al*. (2015) also suggested that there was the need for increased assessment of inmate understanding and enhanced implementation to ensure that inmates receive full benefits of opt-out testing; being informed and tested according to their wishes.

As part of assessing the availability of HIV-related services in female prisons, a question was put across to know whether there was the availability of HIV treatment. It should be noted that 31% of female prisoners who had ever tested and had received their HIV test results tested positive for HIV in this study (as opposed to those who tested but did not know their results or tested negative). That notwithstanding, it was found that 71% of female prisoners indicated that they were not aware of the availability of HIV treatment services being offered in their prisons. Similarly, this could be common in the sub-region as a review reported that HIV treatment coverage in Sub-Saharan Africa prisons was weak, with limited or no provision of HIV prophylaxis for prevention of mother-to-child transmission (PMTCT) and limited access to highly active antiretroviral treatment (ART) (Van Hout, & Mhlanga-Gunda, 2018).

In addition, international reports revealed that many prisoners with HIV were unable to access life saving antiretroviral treatment (ART), meaning that these services are very limited for prisoners in general and for women in particular (UNAIDS, 2019; Avert, 2020). Similarly, previous studies had also found that there was often insufficient access to ART in prison due to a lack of comprehensive policy on HIV service delivery (Underhill, Dumont & Operario, 2014; Valera *et al*., 2017). Additionally, other studies explained that the low or non-existence of HIV treatment in prisons due to lack of national resource allocation to prisons was a barrier to HIV management (Todrys, & Amon, 2012; Van Hout & Mhlanga-Gunda, 2018). This could mean that, globally, the

provision of HIV treatment in prisons is scarce or non-available in most prisons (Kamarulzaman *et al*., 2016).

Furthermore, the study assessed whether the female prisoners were aware of HIV support groups/peer educators in their respective prisons. This was against the backdrop that a peer education programme was instituted in prisons where prisoners who are literate, have good communication skills and can maintain confidentiality are recruited as peer educators to provide education to their peers in Ghana (Faria, 2008; Avert, 2020). Nonetheless, this study found that 88% of female prisoners were not aware of HIV support groups/peer educators in their respective prisons.

This could be a bit surprising considering that these peer educators receive five days of training on HIV prevention, stigma and discrimination, STIs, sexual and gender-based violence and facilitation skills to enable them to be able to offer support to other prisoners in a confidential manner. Specifically, this peer educator programme involves movie sessions and drama performances on HIV-related issues and distribution of educational materials (Avert, 2020). However, this may not be seen as surprising when viewed from the perspective of what happens in other contexts. Similar findings were reported among prisoners in South Africa (CDC, 2020); and peer education is less used in England and Wales than in the US (Bagnall *et al*., 2015).

Contrary to the finding in this study, a survey found that most prisoners reported having a peer education programme in their facilities in USA (Lyons, Osunkoya, Anguh, Adefuye & Balogun, 2014; Valera *et al*., 2017). Other studies also reported that peer education programme participation improved HIV test rates for participants in Texas, USA (Ross, Harzke, Scott, McCann, & Kelley, 2006; Valera *et al*., 2017). Additionally, other researchers argued that peer education programmes were particularly effective at reducing HIV risk behaviours and appeared to have significant benefits for the peer educators (Boudin et al., 199; Scott *et al*., 2004; Valera *et al*., 2017).

These differences could be attributed to the fact that the peer educators programme was fairly new in most prisons in Africa (CDC, 2020). Hence, there was scarce empirical research on correctional

peer programmes in the areas of HIV/AIDS (Datiko, 2019). Perhaps, to help improve on the effectiveness of the peer education programme in Ghanaian prisons, it is necessary to observe the suggestion that being a peer worker is associated with positive health; peer support services are also an acceptable source of help within the prison environment and can have a positive effect on recipients (Bagnall *et al*., 2015).

Topp *et al*. (2017) lament that access to health and health service in Zambian prisons is in a state of 'chronic emergency'. This study tested this assumption to establish the veracity or otherwise in Ghanaian prisons. Thus, the female prisoners' perception of access to HIV-related health services was examined in this study and found that 65% indicated that HIV services were accessible to every prisoner. A similar finding had been reported where inmates who had tested positive for HIV reported that ART was often available at the prison referral hospital or through the Go Centre/CHRESO at the six prison facilities in Zambia (Todrys, Amon, Malembeka, & Clayton, 2011). Todrys *et al*. (2011) showed that 60% of prisoners who reported to have tested positive for HIV had started some form of treatment, including ART in Zambia.

Contrary to the above, this study found that 35% of female prisoners showed that HIV services were not accessible to them. Similarly, reports had revealed that HIV prevention programmes and other prison-based services were rarely made available to prisoners; and were very limited for female prisoners (UNAIDS, 2019; Avert, 2020). In addition, a review showed that most female prisoners in Sub-Saharan Africa were unable to access HIV services in prison due to structural and economic barriers (Van Hout, & Mhlanga-Gunda, 2018).

Topp *et al*. (2017) looked at this issue from a health system's perspective and argued that despite a favourable legal framework, four major and intersecting structural factors undermined the Zambian prison health system. These researchers observed that lack of health financing was a central and underlying challenge, including a weak health governance due to an undermanned prisons health directorate which impeded planning, inter-sectorial coordination and recruitment and retention of human resources for health in the prisons in Zambia (Topp *et al*., 2017). From a global perspective, the United Nations Office on Drugs and Crime concedes that these health

services are mostly characterised by shortage of staff and essential medications and often healthcare provision in prison settings is isolated from the general healthcare system, hampering the quality of health care (UNODC, 2010).

In order to resolve the deficiencies in the availability and access to HIV-related and overall healthcare services in prisons, the idea has been muted that these should be seen as a human rights issue (Van Hout & Mhlanga-Gunda, 2018). Van Hout and Mhlanga-Gunda (2018) posited that the issue of HIV/AIDS in prisons in Sub-Saharan Africa is both a human rights and public health issue which require a strategic approach with shared public health and human rights goals in policies to prevent HIV transmission and improve health, especially for female prisoners.

Topp *et al*. (2017) support this view by noting that human rights protection is essential for curbing the spread of HIV and TB in Zambian prisons. It leads to achieving broader goals to reduce HIV and TB in Zambia. Therefore, it is necessary for policy makers to consider prisons as appropriate places for prevention, diagnosis and treatment of HIV infection among female prisoners and find a strategy to provide effective health services during and after imprisonment for prisoners as high-risk populations (Golrokhi *et al*., 2018). This view is also confirmed by a study which suggests the need for policy and administrative reform to establish strong mechanisms for domestic prison health financing and enable proactive prison health governance, planning and coordination (Topp *et al*., 2017).

5.5. Comprehensive knowledge of HIV/AIDS transmission and prevention among female prisoners

This section presents discussion of results relating to the level of comprehensive knowledge of HIV/AIDS transmission and prevention among female prisoners; and the relationship between comprehensive knowledge of HIV/AIDS and socio-demographic characteristics and prison environment. These findings have been related to existing literature as well.

Level of comprehensive knowledge of HIV/AIDS transmission and prevention among female prisoners

This sub-section presents a discussion of the level of comprehensive knowledge of HIV/AIDS transmission and prevention among female prisoners. Since the HIV/AIDS disease was first reported in 1986 in Ghana, it was important to ascertain whether the female prisoners were aware or had knowledge of it (Amofah, 1992). When the question was asked and analysed, the finding was that the level of knowledge of HIV/AIDS among the female prisoners was universal as all (100%) of them indicated that they had heard of HIV/AIDS. This contrasted the fact that comprehensive knowledge of HIV/AIDS transmission and prevention among female prisoners in this study was low (19.9%) due to some HIV misconceptions.

This was similar to the finding of a study of private university students in Ghana (though unrelated) whose HIV knowledge was very good yet HIV testing was low (Asante, 2013). At the national level, similar findings have been reported where knowledge of AIDS was almost universal among the general Ghanaian population in the age range 15-49 years (98% for women and 99% for men respectively) (Ghana Statistical Service (GSS), 2015).

Nonetheless, on the issue of misconceptions, 40% of women and 37% of men said that HIV could be transmitted by mosquito bites while 65% of women and 42% of men believed that HIV could be transmitted by supernatural means (Ghana Statistical Service (GSS), 2015).

Internationally, similar findings were reported among prisoners where 20.5% had comprehensive knowledge of the routes of HIV transmission and preventive measures in Iran (Navadeh *et al*., 2013). Furthermore, this finding corroborates a study which found that HIV was not a silent issue to Nigerian prison inmates (Audu *et al*., 2013). Audu *et al*. (2013) found that majority of inmates had good understanding of HIV/AIDS even though there were still some misconceptions in the mode of transmission and the correct meaning of the acronym HIV/AIDS. Majdi *et al*. (2011) found that prisoners demonstrated average to good knowledge of HIV/AIDS in Mazandaran province in Iran. Even with this, these analysts contend that misconceptions were present as the respondents showed limited knowledge of how HIV and AIDS could be transmitted.

Another study found that most of the prisoners were aware of HIV/AIDS even though 12.8% said HIV could be transmitted through mosquito bites and 14.9% said it could be transmitted spiritually and through witchcraft in Nigeria (Olugbenga-Bello *et al*., 2013). In addition, a study reported that only 32% of the adult population had comprehensive knowledge of HIV transmission and prevention in Nigeria (Okonkwo, Ameh, Otu & Okpara, 2017).

Similar to the findings of this study, a systematic review among key populations at higher risk of HIV found that basic HIV/AIDS knowledge and attitudes were high while the level of comprehensive knowledge of HIV/AIDS was low and HIV/AIDS misinformation and misconceptions were predominant in Middle East and North Africa (Mumtaz, Hilmi, Majed & Abu-Raddad, 2020). A study among prison inmates found that knowledge of HIV was high (94.6%) in Ogbomoso in Oye State, Nigeria (Saliu & Akintunde (2014). Saliu and Akintunde (2014) observed that there were still misconceptions as 68.9% of respondents believed that people with the disease should be avoided. These researchers noted that even though knowledge of HIV/AIDS among inmates was high, misconceptions were still rife among prison inmates in Nigeria (Saliu & Akintunde, 2014).

A study found that 9.1% of army personnel under the age of 30 years believed that HIV/AIDS could be contracted through mosquito bites as against 2.8% of those above 30 years in Nigeria (Okeke, Onwasigwe & Ibegbu, 2012). Contrary to the findings of this study where the level of comprehensive knowledge of HIV/AIDS transmission and prevention was low, three national surveys conducted among female sex workers (FSW), prison inmates and people who inject drugs (PWID) found that more than 90% of all participants had ever heard of HIV/AIDS and the level of comprehensive knowledge of HIV/AIDS was relatively good in Iran (Khajehkazemi *et al*., 2014).

Against the background of the seeming misconceptions, some researchers recommended that in order to correct misconceptions of HIV/AIDS, education about HIV/AIDS must adopt multi-sectorial approach where partners in this effort would need to include the correctional service

authority, ministry of health and social welfare, private sector, non-governmental organisations (NGOs), National AIDS Committee, community-based AIDS and health organisations as well as concerned individuals (Akeke *et al*., 2007; Saliu & Akintunde, 2014; Lyons, Osunkoya, Anguh, Adefuye & Balogun, 2014).

Relationship between comprehensive knowledge of HIV/AIDS and socio-demographic characteristics and prison environment among female prisoners

This sub-section presents a discussion of the relationship between comprehensive knowledge of HIV/AIDS and socio-demographic characteristics and prison environment among female prisoners in Ghana. This study found that there was no statistically significant association between comprehensive knowledge and age (p=0.132). Contrarily, a study found that there was a statistically significant positive relationship between knowledge of adult prison inmates and age in Nigeria (Olugbenga-Bello *et al*., 2013).

Relating the findings of this study to the general adult population, a study among older adults (50 years and above) found that there was no significant relationship between age and knowledge of HIV/AIDS in Ghana (Anokye *et al*., 2019). Another study among adults aged 50 years and above did not report any significant relationship between age and knowledge of HIV/AIDS in Botswana (Ama, Shaibu & Burnette, 2016).

In addition, this study found that comprehensive knowledge of HIV/AIDS transmission and prevention increased with level of education. Female prisoners who had secondary school and college/university education had higher level of comprehensive knowledge of HIV/AIDS (p=0.026). Similar to this finding, comprehensive knowledge of HIV/AIDS increases steadily with increasing education level for both women and men in the general Ghanaian population (Ghana Statistical Service (GSS), 2015).

Arguably, research on comprehensive knowledge of HIV/AIDS transmission and prevention among prisoners is sparse and very little is known about the comprehensive knowledge of HIV/AIDS among incarcerated women and how this knowledge, during incarceration, may help

prevent HIV infection (Valera *et al*., 2017). Many studies in this area were overlapped with HIV prevention with a focus on HIV education programmes (Boudin *et al*., 1999; Collica, 2002; West & Martin, 2000; Valera *et al*., 2017).

Additionally, it is argued that prisoners often cannot understand the HIV prevention information they are given (Avert, 2020). Even in high-income countries, information, education and communication programmes for prisoners about HIV and other STIs are not making enough impact and this could be attributed to the high levels of illiteracy among prisoners which could complicate HIV information, education and communication (IEC) programmes (Avert, 2020). This emphasises the importance of tailoring programmes to meet prisoners' specific needs or they will be ineffective (Avert, 2020).

In relation to the country of residence, this study found that there was a statistically significant association between country of residence and comprehensive knowledge of HIV/AIDS transmission and prevention ($p<0.01$). Generally, foreign prisoners had comprehensive knowledge as compared to Ghanaian prisoners. This could be explained by the fact that foreign prisoners might have been exposed to more educational programmes on STI than their Ghanaian counterparts, which has a relationship with the suggestion that culture and religion have a remarkable influence on communicating and implementing STI educational programmes (Ghaheri, 2016).

In addition, on the issue of length of stay in prison, the study observed that comprehensive knowledge of HIV/AIDS increased with length of stay in prison except for prisoners who had stayed for 3 years and above. However, this association was not statistically significant ($p=0.710$). In similar terms, a study found that the length of stay within prison and whether remanded or convicted were also not statistically significant between HIV sero-positive and those negative (Chimphambano, Komolafe & Muula, 2007).

5.6. Personal HIV risk perception among female prisoners and HIV risk reduction strategies used in prison

This section presents discussion of the study results with regards to personal HIV risk perceptions among female prisoners and their relationship with literature. The results showed that for risk in general, 45% of the female prisoners reported that they perceived themselves to be at no risk of HIV infection. Additionally, while 51% perceived themselves to be at low risk, only 4% perceived themselves to be at high risk. This means that overall, 55% of the female prisoners perceived themselves to be at some risk of HIV infection before incarceration.

Similarly, a study among inmates reported that women showed an increase in overall perceived HIV risk, mostly due to an increase in their perceived risk of HIV infection in prison (West & Martin, 2008). Earlier, national surveys conducted among female sex workers (FSW), prison inmates and people who inject drugs (PWID) had found that half of them perceived themselves to be at risk of contracting HIV in Iran (Khajehkazemi *et al*., 2014).

Additionally, a study among key populations at high risk of HIV (KPAR) found that perception of risk of infection was low (Mumtaz *et al*., 2020). The difference between the findings of the current study and earlier studies could be explained by the type of study population involved and country contexts. The current study involved only female prisoners in Ghana where the general perception of HIV infection is explained based on socio-cultural basis; acquired through promiscuity or as a curse for a wrong done.

Contrary to the findings of this study, another study among prisoners found that for risk in general, 64% of the women thought that they had a low or no chance of HIV infection while 32% perceived themselves to be at high or medium risk of HIV infection in Maryland, USA (Long, 2011). Long (2011) argued that this may be due to the reason that many prisoners might have engaged in high risk behaviours prior to their incarceration.

On the question of whether the respondents perceived themselves to be at risk while in prison, this study found that only 43% of the female prisoners indicated that they perceived themselves to be

at low risk of getting HIV in prison while majority (54%) thought that they had a high risk of HIV infection in prison.

Although different sets of prisoners were involved in this and other studies (females and males), similar findings could be identified when it comes to HIV risk perceptions among male prisoners (see Golin *et al*., 2018). For instance, a similar finding was reported among incarcerated men where 20% perceived a low HIV risk while majority (78.2%) perceived a high HIV risk in the USA (Golin *et al*., 2018). However, other studies have argued that the HIV risk perception is always higher among females than males in USA (Harris & Glaser, 2006; Long, 2011).

Contrarily, a study found that 54% of female prisoners perceived no risk of HIV infection while 46% viewed themselves to be at some risk of HIV infection in prison (Long, 2011). This is supported by another study among drug-using African-American male prisoners which found that <1% reported having a 100% chance of getting HIV/AIDS at the 12-month follow-up interview after being released from prison (Knighton *et al*., 2016).

A bivariate analysis was conducted to assess the association between female prisoners' personal HIV risk perception while in prison and some selected variables of interest such as age, education, marital status and HIV risky behaviour. In relation to personal HIV risk perception while in prison and age, this study found that there was a significant association (p=0.026) as female prisoners who were older perceived their HIV risk as low in prison. Nonetheless, after the logistic regression analysis, age was no longer a significant predictor of personal HIV risk perception while in prison.

A similar finding from a study among incarcerated men was that being younger was associated with elevated HIV risk perception in the US (Golin *et al*., 2018). This was also supported by a study among in-school adolescents where age was associated with having HIV risk perception at the bivariate level in Ghana (Afriyie & Essilfie, 2019). Other studies reported that older prisoners were less likely to misperceive their HIV risk (Sheeran, Harris & Epton, 2014; Golin *et al*., 2018).

Contrary to the findings of this study, a study among African American male prisoners found that age was a significant correlate in the logistic regression model when perceived HIV risk was examined (Knighton *et al*., 2016). This view is also confirmed by another study among older African-American men who perceived themselves to be at a lower risk for HIV, even though data suggested that infection rates were disproportionately higher for this group (CDC, 2015; Knighton *et al*., 2016).

This study found that there was no statistically significant association (p=0.408) between personal HIV risk perception in prison and level of education. From the opposite sex, a study among incarcerated men found that there was no statistically significant association between HIV perceived risk and level of education (Golin *et al*., 2018). This corresponds with a study among in-school adolescents which found that school was not associated with HIV risk perception in Ghana (Afriyie & Essilfie, 2019). A similar finding was reported among drug-using African-American male prisoners (Knighton *et al*., 2016).

In contrast to the findings of this study, a previous study had found that lower academic level was associated with an increased perception that prisoners were prone to HIV/AIDS infection in Cameroon (Tarkang *et al*., 2016). This perception could be due to the belief that prisons are an environmental threat because they are more likely to feel as though they have little or no control over their own lives (Long, 2011; Tarkang *et al*., 2016).

Another variable of interest regarding personal HIV risk perception was marital status. This study found that there was a significant association between perceived risk while in prison and marital status (p<0.01) since female prisoners who had never been married had a high HIV risk perception in prison. Nonetheless, marital status was not significant after the multivariable analysis was conducted. In support of this finding, a study among prisoners found that HIV risk perception among women decreased as relationships transitioned from casual to monogamy in Texas, USA (Alarid & Hahl, 2014). In addition, a study found that being single was associated with a higher perception of risk of contracting HIV in Nigeria (Adebayo *et al*., 2010). Other researchers have

shown that respondents who are single mostly had a greater number of sexual partners and a high HIV risk perception (Golin *et al*., 2018).

This study found that personal HIV risk perception in prison was strongly associated with HIV risky behaviour**.** Thus, female prisoners who perceived a high chance of being infected with HIV in prison had engaged in HIV risky behaviour. This finding is consistent with previous studies where perceived risks were associated with sexual behaviours (Corneli, *et al*., 2014; Maughan-Brown & Venkataramani, 2018). Similarly, a study among prisoners found that both men and women who had engaged in HIV risky behaviours were most likely to perceive themselves as having a greater chance of HIV infection in prison (Long, 2011).

Another study among incarcerated men reported that prisoners with a high perceived risk were more likely to engage in a risky behaviour in US (Golin *et al*., 2018). Golin *et al*. (2018) emphasised the need for tailored interventions to reduce HIV risk among incarcerated population since most prisoners at elevated HIV risk are aware of their risk and yet continue to engage in HIV risky behaviours. This suggestion could be considered when efforts are being made to address the challenges associated with HIV risky behaviours among incarcerated persons.

In addition, a study among prisoners found that high-risk sexual behaviours and injection drug use (IDU) both shared positive statistically significant relationships with an individual's perceived HIV risk in Texas, USA (Alarid & Hahl, 2014). Contrary to the finding on this variable of this study, another study reported that sex workers felt that their risk of HIV infection was far lower than the general population, apparently because they had the opportunity to be educated about HIV preventive measures compared with other women who might have never heard about condoms in Nigeria (Ankomah *et al*., 2011). Previous research suggested that even though incarcerated African-American men had engaged in risky sexual behaviours and with a high prevalence of HIV infection, their actual perceived HIV risk was low (Khawcharoenporn, Kendrick, & Smith, 2012; Morrow *et al*., 2009; Knighton *et al*., 2016).

Other researchers have reported that perceptions vary among individuals carrying out risky behaviours and some may be unaware of or underestimate their risk (Ankomah *et al*., 2011; Fan *et al*., 2014; Golin *et al*., 2018). In addition, only a few studies have assessed discrepancies between perceived and actual risks specifically for HIV (Nunn *et al*., 2011; Mgbere *et al*., 2013; Golin *et al*., 2018). Some researchers have argued that how much an individual perceives him or herself to be at risk of acquiring HIV can drive the desire both to be tested for HIV and to engage in HIV risk-reducing behaviours, making it an important construct to understand (Earnshaw, Smith, Chaudoir, Lee & Copenhaver, 2012; Sheeran *et al*., 2014; Golin *et al*., 2018). To create the needed balance, other studies showed that improving the accuracy of individuals' perceptions of risk could increase their risk-reducing behaviours (Sheeran *et al*., 2014; Golin *et al*., 2018).

Some researchers reported that HIV risk perception had been identified as a motivating factor for HIV behaviour change (Weinstein, 1984; Knighton *et al*., 2016). Similarly, other researchers found that risk perception played a significant role in driving risk-reduction behaviours among incarcerated men in USA (Golin *et al*., 2018). Golin *et al*. (2018) suggested that identifying incarcerated populations and potentially targeting interventions to improve their risk perceptions could be an effective means of reducing HIV risky behaviour in a population at an elevated HIV risk. These researchers explained that there was limited data delineating both the extent to which prison populations engaged in various HIV risky behaviours and their risk perceptions (Golin *et al*., 2018).

5.7. Coping strategies to prevent HIV infection among female prisoners

The coping strategies to prevent HIV infection among female prisoners were assessed. The results showed that majority (73%) reported that they did not share sharp equipment such as razor blades and needles with other prisoners. Similarly, a study among key populations reported that 90% of injection drug users used clean needle and syringe during their most recent injection as a strategy to prevent HIV infection in Kenya (Musyoki *et al*., 2018).

Against this backdrop, other researchers have recommended the need to scale up integrated behavioural and structural interventions/programmes towards achieving the HIV preventative

effect for people who inject drugs and the wider population (Musyoki *et al*., 2018; Avert, 2020). This is confirmed by the evidence that prisons which instituted the Needle and Syringe Programmes (NSPs), which provided sterile needles and syringes, were readily accepted by prisoners who injected drugs and this contributed to a significant reduction in syringe sharing over time and was effective in reducing HIV infections (World Health Organisation (WHO), 2007; Jürgens *et al*., 2011).

Even as other analysts have rejected this notion, others have argued that there was no evidence to suggest that prison-based NSPs have serious or unintended negative consequences such as increased drug use or injection (Jürgens *et al*., 2011). This view is corroborated by other researchers who revealed that harm-reduction methods such as needle and syringe programmes, opioid substitution therapy and counselling were proving to be effective HIV prevention strategies for people who inject drugs (Avert, 2020). Contrary to this position, it has been observed that providing such programmes will not necessarily lead to use as a study among prisoners who injected drugs reported that only a small number accessed the Needle and Syringe Programme (NSP) when it was located within the healthcare section of the prison (Hoover & Jürgens, 2009; Jürgens *et al*., 2011).

In addition, this study found that as many as 25% of female prisoners in this study reported that they did "nothing" to reduce their risk of HIV infection in prison. Previous studies have reported a similar finding among prisoners in the literature (Long, 2011; Tarkang *et al*., 2016). Tarkang *et al*. (2016) where they explained that prisoners might feel as though they have little or no control over their own lives, hence, would do nothing to prevent HIV infection in prison. Similarly, a study among sex workers reported that most of them strongly believed that it was only God who could protect them from HIV infection, hence, did not adopt any HIV risk reduction strategy (Ankomah *et al*., 2011). Therefore, it is necessary for HIV programmes to encourage female prisoners and sex workers to understand and undertake accurate self-appraisal of their risk to reduce HIV-related risks (Ankomah *et al*., 2011). This suggestion could be applied to any intervention aimed at reducing HIV risk among female prisoners.

5.8. HIV risky behaviour of female prisoners and selected variables

This section presents discussion of the study findings in relation to literature. That is, the study assessed the association between HIV risky behaviour of female prisoners and some selected variables of interest. These included age, level of education and religious status.

This study assessed the association between HIV risky behaviour and age among the female prisoners. The finding was that HIV high risky behaviour reduced as age increased even though this association was not statistically significant (p=0.172). This trend seems to be recurring in the literature. For instance, a study among prisoners found no statistically significant association between HIV risky behaviours and age in a jail in Virginia, USA (Adams *et al*., 2013). Contrary to this finding, an unrelated study among young people found that age was a consistent predictor of risky and criminal behaviours in Peru where young people engaging in risky behaviours were more likely to be slightly older than those who were not at risk (Favara & Sanchez, 2017).

Another variable of interest regarding HIV risky behaviour was education. This study found that higher level of education was a negative correlate for HIV risky behaviour. Generally, high HIV risk behaviour reduced with higher level of education. Previous studies have reported similar findings where higher education was negatively correlated with the total number of risky behaviours among prisoners (Corneli, *et al*., 2014; Ndugwa Kabwama & Berg-Beckhoff, 2015; Favara & Sanchez, 2017; Maughan-Brown & Venkataramani, 2018). This seems to suggest that higher education might play a protective role against HIV risky behaviours (Favara & Sanchez, 2017).

In addition, this study found that there was a statistically significant association between HIV risky behaviour and religious status (p=0.046). However, religious status lost its significance after the multivariable analysis was conducted. Similar findings from general literature showed that among men, muslims and traditionalists were significantly less likely to engage in risky sexual behaviour compared with Christians in Ghana (Gyimah, Tenkorang, Takyi, Adjei & Fosu, 2010). Gyimah *et al*. (2010) noted, however, that those differences disappeared once the socioeconomic variables were controlled for in the logistic regression model.

An earlier study among women had found that there was no statistically significant association between religious affiliation and HIV risky behaviour, particularly the use of condoms in Ghana (Takyi, 2003). Similarly, from the international arena, a study among adults from the general population aged 15–59 years reported that religious affiliation was not always associated with HIV/AIDS protective behaviours in a rural area in Central Senegal (Lagarde *et al*., 2000; Ludema *et al*., 2015).

In contrast, a study among African-American women from rural Alabama and North Carolina, USA found that high organisational religiosity, high non-organisational religiosity and high spirituality were associated with having fewer risky personal sexual behaviours in the past 12 months in the adjusted models (Ludema *et al*., 2015). In addition, a study among the youth found that religiosity was a protective factor for sexual behaviour and this positive association was still evident even after controlling for other covariates in Nigeria (Somefun, 2019). These findings support the contention that religiosity and spirituality are associated with behavioural proximate determinants of HIV acquisition (Ludema *et al*., 2015). Hence, some researchers note that religion and spirituality are sources of resilience in the African-American community and have historically been protective against several poor health outcomes (Sutton & Parks, 2013; Ludema *et al*., 2015). Therefore, other researchers have recommended the need for the involvement of faith-based organisations and collaborations between public health workers and religious leaders in the essential dissemination of information on the prevention of HIV risky behaviours (Lagarde *et al*., 2000; Sutton & Parks, 2013; Ludema *et al*., 2015).

5.9. The Implications of current research in wider Context

The findings have largely supported the conceptual framework of this study which was inspired by the AIDS Risk Reduction Model (ARRM) (Catania *et al*., 1990; Durojaiye, 2011). The ARRM model posits that before an individual labels a behaviour as problematic, they must go through three stages. The first stage of ARRM is to recognise and label an individual's behaviour as high risk. This is influenced by knowledge of HIV transmission methods (Durojaiye, 2011). Relating

this to the study, it was found that female prisoners perceived a high HIV risk perception while in prison and they were fearful of being infected with HIV. In addition, this study showed that female prisoners who accurately exhibited HIV risky behaviours in prison were more likely to perceive HIV risk perception in prison.

In general terms, stage two of ARRM reflects the decision-making approach which is the next step in the process of changing high risk behaviours which involves reaching a firm decision to make behavioural changes and strongly committing to that decision (Catania *et al*., 1990). Relating it to this study, it was revealed that female prisoners had made a decision to prevent themselves from being infected with HIV, hence, 42.3% did not engage in HIV risky behaviour. In addition, the majority of female prisoners who had engaged in HIV risky behaviour were committed to change their HIV risky behaviour and practices by not sharing sharp equipment such as razor blades and needles with other prisoners. This was a risk reduction strategy to prevent HIV infection in prison.

Furthermore, this study revealed that there were as many as 25% of female prisoners who reported that they did "nothing" to reduce their risk of HIV infection in prison. As per the third stage of the AIDS Risk Reduction Model (ARRM) (Catania *et al*., 1990), these prisoners might feel as though they had little or no control over their own lives. Therefore, these female prisoners might not be able to prevent HIV infection or reduce the HIV risk because of the presence of other prisoners, prison officers and prison regulations/laws. A similar observation had been documented earlier (Mimiaga *et al*., 2009; Tarkang *et al*., 2016). This means that these female prisoners might resign themselves to the situation while waiting for it to rectify itself as it is reflected in the ARRM (Catania *et al*., 1990; FHI360, 2020).

Additionally, female prisoners might employ cognitive coping strategies such as denial or strong belief in God for divine protection against HIV infection in prison because they feel powerless to effect any behaviour change (Catania *et al*., 1990). This suggestion has been documented even among sex workers in Nigeria (Ankomah *et al*., 2011). Therefore, there is the urgent need to assist and encourage female prisoners to accurately conduct an individual HIV risk assessment by providing them with social support and basic needs. These could include regular provision of clean

razors, blades and other hygiene kits in order to assist them to enact the desired HIV behavioural change as suggested earlier (Mimiaga *et al*., 2009).

Other researchers have reported that changing high HIV risk behaviours is the only means of preventing transmission of HIV (Chin *et al*., 2012). Chin *et al*. (2012) noted that these could include a combination of prevention methods. This is essential due to the reason that HIV prevention is neither simple nor can be simplified. Overall, it was found that the general stages defined by the ARRM were applicable in the context of this study.

5.10. Limitations of the study

Some limitations of this study were cognisable at the onset; most of which were related to its research designs. However, there were other limitations which got revealed later in the research process. In this section, these limitations are described in the order of their potential impact on this study.

Firstly, the small number of female prisoners in Ghana affected the sample size of this study. Generally, in the Ghanaian communities, females are not seen to be people who get imprisoned for serious crimes. Another reason which accounted for the limited sample size of female prisoners was the influence of the Justice For All Program in Ghana. This seeks to decongest the prisons by fast tracking the hearing of remand prisoners by setting up mobile courts in the prisons. These factors influenced the sample size which subsequently affected the statistical analysis such as the bivariate and multivariate models.

Another limitation to the study was the absence of a baseline study on the personal HIV risk perceptions among female prisoners in Ghana. Due to this, there were no guidelines on the efficacy of different tools in the study's context. This study had to take leads from studies conducted elsewhere to decide on tools to examine HIV risk perceptions among female prisoners in Ghana.

To account for this, variables which were particularly relevant to Ghana's context were introduced. However, the reliance on previous literature, which came mostly from USA and Europe, had implications on this study where cultural factors led to differential responses to certain questions.

There was a limitation attributed to the design of the study. As it is the issue with all cross-sectional studies, this study provides only a snapshot of the perception of HIV risk among female prisoners in a specific space and time. The variations in HIV risk perception and their subsequent impact on high HIV risky behaviours could have been examined with a longitudinal research design. However, a longitudinal research requires substantial time and funding which makes it mostly unfeasible for PhD research projects. As the present study used a cross-sectional design, it prevented drawing up of conclusions regarding causal associations due to temporary ambiguity among the variables.

The use of self-reported data to assess HIV risky behaviour may be inaccurate, given that the content of the study involved sensitive topics such as current drug use and sexual behaviours. Participants may have been reluctant or uncomfortable to report behaviours that they considered immoral or against prison laws. However, this bias was minimised by assuring prisoners that their responses would be confidential and was not going to affect their current prison sentence or stay in prison. Moreover, as 58% of the participants reported engaging in HIV risky behaviour, it suggested that participants felt comfortable reporting many HIV risk behaviours.

Finally, the sample size for the current study was purposeful in that only female prisoners above 18 years in all female prisons in Ghana were included. This could restrict the extent to which these findings could be generalised. Nonetheless, the limitations of this study could guide future research not only on HIV and female prisoners but also studies on other subjects conducted in Ghana as described in the next chapter.

5.11. Summary of the chapter

This chapter has presented a discussion of the key findings of the study in relation to extant literature. The analysis was presented according the key objectives of the study. It has been shown that whereas some of the findings were similar to existing literature, others were inconsistent. The implications of the findings for the wider context have also been established in terms of the chosen theoretical model. The next chapter presents the summary, conclusions and recommendations of the study.

CHAPTER SIX

CONCLUSION AND RECOMMENDATIONS

6.0. Introduction

This section presents the summary, conclusions, contribution to knowledge, recommendations, limitations to the study and future research.

6.1. Summary of the study

The study set out to examine the personal HIV risk perception among female prisoners in Ghana. That is, this study focused on all female prisoners in Ghana; an approach which distinguished it from other studies which had focused on both male and female prisoners. This makes this study probably the first attempt to examine the personal HIV risk perception among female prisoners in Ghana. Quantitative research methods were applied to collect empirical data for subsequent analysis. The study found that majority (54%) of the female prisoners perceived a high HIV risk of infection in prison. Generally, the findings of this study were consistent with studies conducted in other parts of the world, however, with some substantial variations in terms of the study population.

6.2. Conclusion

This section presents the conclusions of the study based on the specific objectives.

6.2.1. Comprehensive knowledge of HIV/AIDS transmission and prevention among female prisoners

The study assessed the level of comprehensive knowledge of HIV/AIDS transmission and prevention among female prisoners. The study concludes that the level of comprehensive knowledge of HIV/AIDS transmission and prevention among the female prisoners was low (19.9%) due to misconceptions of the modes of HIV transmission and prevention.

6.2.2. Correlates of personal HIV-risk perception among female prisoners

One other objective of the study was to identify the correlates of personal HIV-risk perception among female prisoners in Ghana. This study concludes that engagement in HIV risky behaviour was found to strongly influence personal HIV risk perception. All female prisoners who had engaged in HIV risky behaviour were more likely to accurately appraise their HIV risk. Nonetheless, a high proportion of female prisoners who had not engaged in HIV risky behaviour overestimated their chances of being infected with HIV in prison. Our findings suggested that this inaccuracy stems from HIV risk perceptions being driven by an incomplete understanding of epidemiological risk and being influenced by a range of psycho-social factors not directly related to HIV risky behaviour.

This study included questions related to coping strategies which female prisoners used/adopted to prevent being infected with HIV in prison. It was found and concluded that majority (73%) of female prisoners reported that they did not share sharp equipment such as razor blades and needles with other prisoners while quite a high proportion (25%) of female prisoners did "nothing" to reduce their risk of HIV infection in prison. As reported in previous studies, these prisoners might have felt as though they had little or no control over their own lives in prison while others strongly believed in God to protect them from being infected with HIV.

6.2.3. HIV-related risk behaviours among female prisoners

Another objective was to examine HIV-related risk behaviours among female prisoners. The HIV-related risk behaviours; tattooing/body piercing, unsafe sexual activity, injection drug use, sharing of razor blades and other sharp equipment; were the behaviours considered in this study. These were used to generate a variable called HIV risky behaviour in this study. This study found and concludes that 42.3% did not engage in HIV risky behaviour in prison while more than half (57.7%) of the female population had engaged in, at least, one HIV risky behaviour in prison.

6.2.4. Correlates of HIV risky behaviour among female prisoners

The study had another objective to examine the correlates of HIV risky behaviour among female prisners in Ghana. The study concludes that high school education was negatively correlated with HIV risky behaviour.

6.2.5. Availability of HIV-related services in female prisons

The objective on the above subject was to explore the available HIV-related services in female prisons in Ghana. The study found that HIV-related services were offered (65%) in all female prisoners in Ghana even though provision of HIV testing and treatment were not adequately implemented within the prison-based health services. This could be due to insufficient clinical staff in prisons to provide HIV counselling, testing and subsequent treatment to prisoners who had tested positive for HIV. In addition, limited funding for HIV-related services in prisons could be a challenge for the provision of these services for female prisoners. Non-Governmental Organisations (NGOs) and faith-based organisations had played a key role in the provision of HIV education and HIV testing for female prisoners in Ghana. Most female prisoners were not aware of HIV support groups/peer educators in their respective prisons. This is quite ironic, considering the effectiveness of peer education programmes in providing support for new prisoners, improving HIV test rates and reducing HIV risk behaviours.

6.3. Contribution to knowledge

This section presents the contribution that this study makes to literature in the field of research in prisons. Generally, the current study makes contribution to knowledge since it appears to be the first study to have examined HIV risky behaviours and HIV risk perception among only female prisoners in Ghana. In specific terms, the study contributes to knowledge in areas of policy and practice, management of HIV health services in prison and theory as explained below.

Contribution to policy and practice

It would be recalled that there are international prison recommendations which state that voluntary and confidential HIV counselling and testing (VCT) should be available to prisoners and

mandatory or compulsory HIV testing should be rejected (UNODC, 2006). To make this a reality, other views have been that HIV testing of prisoners should involve pre and post test counselling in order to provide information about the test results, risk assessment, partner notification and treatment options (Centers for Disease Prevention and Control (CDC), 2006; Zaller *et al*., 2007).

Currently, the official position is that testing should be compulsory for prisoners based on the availability of test kits in prisons in Ghana (Ghana Prison Service, 2020).

The findings of this study could contribute to policy formulation and reformulation in this regard. This study fills a gap in literature by examining the personal HIV risk perception among female prisoners in Ghana since women have historically been excluded or left out from HIV/AIDS research. Thus, the findings of this study on HIV prevalence and risk behaviours in prisons are essential in creating an appropriate national response.

This is relevant in the sense that the findings provide insights into the HIV risk behaviours and perceptions of HIV among potentially HIV negative female prisoners in Ghana. For instance, it has brought to light and confirmed that most female prisoners engage in HIV risky behaviours that place them at risk of HIV infection in prison and they accurately perceive their risk of contracting HIV. This is an important finding which would help to tailor HIV prevention messages towards this group of people in society such that they would minimise behaviours that could predispose other people in the community to HIV infection upon their release. The findings of this study could be considered for inclusion in policy discussions by countries that have similar challenges in managing HIV infection in prisons.

The theoretical framework of this study was based on the AIDS Risk Reduction Model (ARRM). The AIDS Risk Reduction Model (ARRM) is one of numerous stages of change models that posit behaviour change to be a process in which individuals move from one step to the next as a result of a given stimulus (Catania, Kegeles & Coates, 1990). The ARRM hypothesises that behaviour change is a process occurring in three stages: labeling one's behaviour as problematic, making a commitment to behaviour change and taking action to accomplish that change. The present study

has analysed each of these stages of the ARRM and found them to be linked in the same order as hypothesised. Generally, the study was successful in achieving its stated objectives in comparison with the tenets of this model. This implies a contribution to the theoretical framework and the need for future researchers to consider and apply similar models in quantitative methods.

6.4. Recommendation

Based on the results of the study, the following recommendations are made:

Policymakers: Ministry of Health /Ghana Health Service

There is the need for policymakers, especially in the Ministry of Health / Ghana Health Service and other international policy establishments, to ensure tailored interventions to address the challenges associated with HIV risky behaviours among incarcerated persons. This is based on the observation that most of the female prisoners at elevated HIV risk in this study were aware of their risk and yet continued to engage in HIV risky behaviours.

In addition, this study showed that female prisoners who did not engage in HIV risky behaviour perceived a high HIV risk. Hence, this is why there is an urgent need for HIV interventions that will help female prisoners to correctly assess their HIV risk perception and build on their susceptibility to HIV infection.

It is important to provide comprehensive HIV-related services for prisoners. This should include access to regular and adequate HIV test kits for voluntary, confidential HIV testing with counselling. This will conform to international recommendations on the need to provide “access to voluntary testing and counselling for prisoners” and to “prohibit mandatory testing” as it is done for people in the outside community (World Health Organisation (WHO), 2000). Furthermore, it is useful to ensure that HIV testing is accompanied by access to treatment, care and support (including antiretroviral treatment).

There is a need for a policy and administrative reform to establish strong mechanisms for domestic prison health financing and enable proactive prison health governance, planning and coordination. This will support the limited funding for HIV services/activities for prisoners. This is supported by the findings that although HIV services were available in all female prisons, there was a seeming lack of adherence to the guiding principles; lack of adequate resources regarding the HIV testing and treatment for female prisoners.

Ghana AIDS Commission and Stakeholders

There is the need to intensify HIV education on transmission and prevention in the general population. The idea is that when this is done, it would disabuse the minds of the general population of the misconceptions surrounding the infection. This would have a rippling effect on prisoners, especially female prisoners. The argument is premised on the findings of this study which showed that most of the female prisoners had no comprehensive knowledge of HIV/AIDS transmission and prevention due to misconceptions. HIV education is mostly led by Ghana AIDS Commission and other stakeholders.

Consequently, HIV education must adopt a multi-sectorial approach where partners, including the correctional service authority, Non-Governmental Organisations (NGOs), National AIDS Committee, faith-based organisations, community-based AIDS and health organisations as well as concerned individuals should link up efforts with Ministry of Health/Ghana Health Service to address the misconceptions through effective education. This could be done through electronic and print media. This could also be conducted through the community-based gatherings such as durbars and religious services/programmes.

Ghana Prisons Service/ Incarcerated Persons

The Ghana Prisons Service as an institution is responsible for ensuring that incarcerated people are reformed on their release. It has some relevant role to play in the provision of hygienic equipment and environment in the prisons. This would ensure a behaviour change among incarcerated people who get involved in HIV risky behaviours such as sharing of razors/blades. It would be recalled that this study found that sharing of razor blades was a common practice for

most female prisoners. Hence, effective HIV prevention efforts such as regular provision of razors/blades are warranted.

In addition, stricter surveillance and tighter controls need to be enforced to prevent HIV risky behaviours such as injection drug use in prison. The study found that female inmates were sharing instruments and materials used for tattooing/body piercing as well as engaging in sexual activity in prison.

Also, training and education on HIV/AIDS in prisons should be incorporated within the training for general prison staff.

The position of this study is that HIV voluntary testing should be made available to all prisoners on entry, during their stay in prison and upon their release. This is key for the early detection of HIV infection among prisoners. The belief is that if prisoners accept such voluntary testing, it will help to ensure timely treatment and support to prevent the spread of HIV among prisoners.

6.5. Future research

This study serves as a baseline for the perceptions of personal risk of HIV infection among female prisoners in Ghana. Although this study did not have a longitudinal design, future studies may focus on new cohorts of female prisoners to examine the HIV prevalence, relative influences of HIV knowledge, risk perceptions, cognitive processes of risk and other factors such as self-efficacy that may change risk behaviour among prison populations.

There is an urgent need to explore the link between incarceration and HIV infection among female inmates in Ghana. Therefore, it is proposed that future studies should focus on HIV testing on voluntary basis and monitoring of HIV-related behaviours of female inmates at the point of entry to prison and upon release from prison.

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APPENDIX

APPENDIX I: Consent Form for female prisoners

"Perceptions of personal risk of HIV infection among female prisoners in Ghana"

Before you decide whether to participate, you need to understand why the research is being done and what it would involve. Please take time to read or listen as I read the following information. You may talk to others about the study if you wish. Please ask me if there is anything that is not clear, or if you would like more information. When all your questions have been answered and you feel that you understand this study, you will be asked if you wish to participate in the study and if yes to sign or thumbprint this Informed Consent form.

I am a doctoral student at the School of Public Health, University of Bielefeld in Germany. I am working on my dissertation which involves undertaking a national survey on HIV/AIDS knowledge, attitudes and risk perception among female prisoners in Ghana. The main aim of this study is to examine the extent to which female prisoners in Ghana perceive themselves to be at risk of HIV infection.

The study involves one-on-one interview to assess prisoners' knowledge, risk perception and behaviours on HIV and health facilities available in prisons.

The results of this study will enable the Ghana AIDS Commission and its partners to know the risky behaviours that predisposes female prisoners to HIV in order to institute appropriate measures to secure the health of prisoners in Ghana. Also, evidence from this study will help in designing appropriate interventions to target present and future HIV epidemic among female prisoners in the world.

I am therefore asking you to participate in this study to contribute to the national and global effort in preventing HIV and improving the health of prisoners through the information you will provide.

I assure you that any information you will provide will be strictly confidential; and will be used only for the purposes of this research and never be used against you.

Your participation is voluntary, and you may stop the interview at any time.

Do I have your permission to continue? Yes No

Respondent's signature_____

If [If Yes] I, _____ (interviewer) certify that the respondent has given permission to participate in the study.

Interviewer's signature_____

APPENDIX II: Questionnaire for female prisoners

Knowledge, Attitude and Personal risk perception of HIV / AIDS in Prison Population

FEMALE INMATES' QUESTIONNAIRE

Interview Information		
Questionnaire Number	:	[__|__] [__|__]
Name of Prison	:	_____
Type of Prison	:	[__] Maximum security (Ankaful New) [__] Medium security (Nsawam) [__] Central Prison [__] Local Prisons [__] Agricultural Camps
Region	:	_____
Date of Interview	:	Day: _____ Month :_____ Year:_____
Time of Interview	:	Started _____ Finished _____
Name of Interviewer	:	_____
Interview Status	:	[__] FULLY Completed [__] PARTLY Completed [__] Refused
Comments on Interview	:	_____

INSTRUCTION: Please <u>circle</u> the appropriate answer the respondent gives for all closed-ended questions, and <u>write legibly</u> in the spaces answers to all open-ended questions.

NO.	QUESTIONS	CODING	SKIP TO
1.0	**<u>SECTION</u> 1: SOCIO-DEMOGRAPHIC**	**"I am going to start by asking some questions about your background"**	
1.1	How old are you? ***[Age at last birthday]***	Age in years [___|___] Don't know 88 No response 99	

1.2	In which country have you lived for most of your adult life?	Ghana 1 Nigeria 2 United Kingdom (UK) 3 Other..... 4 No response 99	→ **1.5** → **1.5** → **1.5**
1.3	In which region did you live for most of your adult life before coming to prison?	Greater Accra 1 Ashanti 2 Western 3 Central 4 Brong Ahafo 5 Northern 6 Upper West 7 Upper East 8 Volta 9 Eastern 10 No response 99	
1.4	What is your nationality?	Ghanaian 1 Non Ghanaian (Foreigner) 2 No response 99	
1.5	Have you ever attended school?	Yes 1 No 2 No response 99	→ **1.8**
1.6	Up to which level of schooling did you attend?	Primary 1 Junior High 2 Senior High 3 College / University 4 No Response 99	
1.7	What was the highest class you completed?	..... No response 99	
1.8	What is your religion?	Christian 1 Traditional 2 Muslim 3 Other..... 4 No response 99	

1.9	How often do you attend a religious meeting?	More than once a week 1 Once a week 2 Few times a month 3 Few times a year 4 No response 99	
2.0	**SECTION 2 : PRISON ENVIRONMENT**	**"I would like to ask a few questions about your time in prison"**	
2.1	Are you on remand or convicted?	On remand /awaiting trial 1 Convicted 2 No Response 99	**→ 2.3**
2.2	How long is your prison sentence?	Number of Years [___|___] Number of Months [___|___] No response 99	
2.3	How long have you been in prison on this sentence or remand /awaiting trial?	Number of Years [___|___] Number of Months [___|___] No response 99	
2.4	How long have you been in this prison?	Number of Years [___|___] Number of Months [___|___] No response 99	
2.5	How many other prisons have you been in for this sentence?	Number of Prisons [___|___] No response 99	**→ 2.7 if ans=0**
2.6	Can you give the names of other prisons you have been in during this sentence & for how many months / years	……..……. (_ yrs _ months) 1 ....…….(_ yrs _ months) 2 ...…….…… (_ yrs _ months) 3 ..…….....….. (_ yrs _ months) 4 ..…….....(_ yrs _ months) 5 No response 99	

2.7	Have you been in prison before this sentence?	Yes 1 No 2 No response 99		→ **3.0**
2.8	How many times have you been in prison before?	Number of Times Before [___|___] No response 99		
3.0	**SECTION 3 : HIV RISK - BLOOD CONTACT**	**"I would like to ask you some questions about your experiences in prison"**		
3.1	Is there access to blades / razors for shaving in this prison?	Yes 1 No 2 Don't know 88 No response 99		
3.2	Do you share blade / razor *(for shaving or hair cut)* with other inmates in this prison?	Yes 1 No 2 No response 99		
3.3	Have you ever been tattooed or pierced?	OUTSIDE PRISON Yes 1 No 2 No response 99	WITHIN PRISON Yes 1 No 2 No response 99	→ **3.5**
3.4	Was the same implement used for other people?	OUTSIDE PRISON Yes 1 No 2 No response 99	WITHIN PRISON Yes 1 No 2 No response 99	
3.5	Have you ever made a (direct) blood covenant?	OUTSIDE PRISON Yes 1 No 2 No response 99	WITHIN PRISON Yes 1 No 2 No response 99	
3.6	Do you know other inmates in this prison who have made a blood covenant?	Yes 1 No 2 No response 99		
4.0	**SECTION 4:** **HIV RISK – INJECTING DRUG USE**			

4.1	Do you know inmates in this prison who use drugs?	Yes 1 No 2 Don't know 88 No response 99	→ **4.7**
4.2	How often do they use drugs?	Every week 1 Every month 2 Few times a year 3 Less than every year 4 Don't know 88 No response 99	
4.3	Which drugs do you often see used? ***Read out each answer.*** ***Tick number if 'yes'*** ***Multiple responses allowed*** ***Also Specify Combinations***	('Wee') Marijuana 1 Crack / Cocaine 2 Heroin 3 Alcohol 4 Pethidine 5 Valium 6 Other.....7 Don't know 88 No response 99	
4.4	Do you know people in prison who inject drugs?	Yes 1 No 2 Don't know 88 No response 99	→ **4.7**
4.5	Do these people have to share needles?	Yes 1 No 2 Don't know 88 No response 99	
4.6	Which drugs are usually injected by inmates? ***Read out each answer.*** ***Tick number if 'yes'*** ***Multiple responses allowed***	Heroin 1 Crack / Cocaine 2 Amphetamine 3 Pethidine 4 Other..... 5 Don't Know 88 No response 99	

4.7	Have you ever used drugs?	OUTSIDE PRISON Yes 1 No 2 No Response 99	WITHIN PRISON Yes 1 No 2 No Response 99	→ **5.0**
4.8	How often have you used drugs?	OUTSIDE PRISON Every week 1 Every month 2 Few times a year 3 Less than every year 4 Don't know 88 No response 99	WITHIN PRISON Every week 1 Every month 2 Few times a year 3 Less than every year 4 Don't know 88 No response 99	
4.9	Which drugs have you used? ***Read out each answer.*** ***Tick number if 'yes'*** ***Multiple responses allowed***	OUTSIDE PRISON ('Wee') Marijuana 1 Heroin 2 Crack / Cocaine 3 Alcohol 4 Pethidine 5 Valium 6 Other..... 7 Don't Know 88 No response 99	WITHIN PRISON ('Wee') Marijuana 1 Heroin 2 Crack / Cocaine 3 Alcohol 4 Pethidine 5 Valium 6 Other.....7 Don't Know 88 No response 99	
4.10	Have you ever injected drugs?	OUTSIDE PRISON Yes 1 No 2 Don't know 88 No response 99	WITHIN PRISON Yes 1 No 2 Don't know 88 No response 99	→ **5.0**
4.11	How often have you injected the drugs?	OUTSIDE PRISON Every week 1 Every month 2 Few times a year 3 Less than every year 4 Don't know 88 No response 99	WITHIN PRISON Every week 1 Every month 2 Few times a year 3 Less than every year 4 Don't know 88 No response 99	

4.12	Which drugs have you injected? ***Read out each answer.*** ***Tick number if 'yes'*** ***Multiple responses allowed***	OUTSIDE PRISON Heroin 1 Crack / Cocaine 2 Amphetamine 3 Pethidine 4 Other... ..... 5 Don't know 88 No response 99	WITHIN PRISON Heroin 1 Crack / Cocaine 2 Amphetamine 3 Pethidine 4 Other..... 5 Don't know 88 No response 99	
4.13	Have you ever had to share needles with other drug users?	OUTSIDE PRISON Yes 1 No 2 No response 99	WITHIN PRISON Yes 1 No 2 No response 99	
5.0	**SECTION 5:** **HIV RISK – SEXUAL CONTACT**	**"Some of the following questions will be about your personal life and sexual behaviour."**		
5.1	What is your marital status?	Single (never married) 1 Married – One Partner (monogamous) 2 Married – 2+ Partners (polygamous) 3 Divorced 4 Separated 5 Widowed 6 No response 99		
5.2	Before you came to prison – did you ever have other casual partners at the same time as your spouse / long term partner?	Yes 1 No 2 Don't know 88 No Response 99		→ **5.5**
5.3	How often did you have casual partners – in the 12 months before you came to prison?	More than once a week 1 Once a week 2 Few times a month 3 Few times a year 4 No response 99		

5.4	How often was a condom used with a casual partner?	Never 1 A few times 2 Most times 3 Every time 4 Don't know 88 No response 99	
5.5	How often did you have casual partners – in the 12 months before you came to prison?	More than once a week 1 Once a week 2 Few times a month 3 Few times a year 4 No response 99	
5.6	How often was a condom used?	Never 1 A few times 2 Most times 3 Every time 4 Don't know 88 No response 99	
5.7	At this prison – Have you had sex with anyone or other inmates?	Yes 1 No 2 No response 99	→ **5.16**
5.8	Have you had oral sex with other inmates – in this prison?	Yes 1 No 2 No response 99	→ **5.10**
5.9	How many times have you had oral sex in this prison in the last three months?	..... times 1 Don't know 88 No response 99	
5.10	Have you had anal sex with anyone or other inmates – in this prison?	Yes 1 No 2 No response 99	→ **5.13**
5.11	How many times have you had anal sex in this prison in the last three months?	..... times 1 Don't know 88 No response 99	

5.12	How often was a condom used?	Never 1 A few times 2 Most times 3 Every time 4 Don't know 88 No response 99	
5.13	Have you ever paid/received money or goods (e.g. cigarettes, drugs, blades) for sex in prison?	Yes 1 No 2 Don't know 88 No response 99	
5.14	Have you ever engaged in sex with other inmates in this prison who inject drugs?	Yes 1 No 2 Don't know 88 No response 99	
5.15	Did you use condom during your last sex in this prison?	Yes 1 No 2 Non-Applicable 77 No response 99	
5.16	Have you heard of inmates being forced to have penetrative sex?	Yes 1 No 2 Don't know 88 No response 99	→ **5.18**
5.17	How often do you think inmates are forced to have penetrative sex within this prison?	every few days 1 every few weeks 2 every few months 3 Once a year 4 Don't know 88 No response 99	
5.18	How many times have you been forced to have penetrative sex in prison?	..... Times No response 99	

5.19	What do you do when you feel tensed / stressed?	Take a walk 1 Meditate 2 Take / inject drugs 3 Tattooing / piercing 4 Have sex 5 Share your feelings with others 6 Others…… 7	
6.0	**<u>SECTION 6</u>: HIV/AIDS KNOWLEDGE & ATTITUDE AND HEALTH**	**I am going to ask you some questions about HIV/AIDS and health. Please do not worry about getting the right answer, just say what you think is true**	
6.1	Have you ever heard of an illness called AIDS?	Yes 1 No 2 No response 99	
6.2	Can people reduce their chance of getting HIV by having just one uninfected sex partner who has no other sex partners?	Yes 1 No 2 Don't know 88 No response 99	
6.3	Can people get HIV from mosquito bites?	Yes 1 No 2 Don't know 88 No response 99	
6.4	Can people reduce their chance of getting HIV by using a condom every time they have sex?	Yes 1 No 2 Don't know 88 No Response 99	
6.5	Can people get HIV by sharing food with a person who has HIV/AIDS?	Yes 1 No 2 Don't know 88 No response 99	
6.6	Can people reduce their chances of getting HIV by not having sexual intercourse at all?	Yes 1 No 2 Don't know 88 No response 99	

6.7	Can people get HIV because of witchcraft or other supernatural means?	Yes 1 No 2 Don't know 88 No response 99	
6.8	Do you think that HIV can be transmitted by injection with a used needle?	Yes 1 No 2 Don't know 88 No response 99	
6.9	Do you think that HIV can be transmitted by common use of razor blades?	Yes 1 No 2 Don't know 88 No response 99	
6.10	Do you think that HIV can be transmitted by common use of tooth brushes?	Yes 1 No 2 Don't know 88 No response 99	
6.11	Do you think that HIV can be transmitted by tattooing?	Yes 1 No 2 Don't know 88 No response 99	
6.12	Do you think that HIV can be transmitted by sharing blood in brotherhood/ sisterhood rituals?	Yes 1 No 2 Don't know 88 No response 99	
6.13	Is it possible for a healthy looking person to have HIV?	Yes 1 No 2 Don't know 88 No response 99	
6.14	If a member of your family became sick with AIDS, would you be willing to care for her or him in your own household?	Yes 1 No 2 Don't know 88 No response 99	

6.15	If you knew that someone is HIV infected, would you <u>eat with him or her</u>?	Yes 1 No 2 Don't know 88 No response 99	
6.16	If you knew that someone is HIV infected, would you <u>continue to meet or associate with him/her?</u>	Yes 1 No 2 Don't know 88 No response 99	
6.17	If you knew that someone is HIV infected, would you <u>share a cell with him/ her</u>?	Yes 1 No 2 Don't know 88 No response 99	
6.18	Have you ever had an HIV test, before this survey?	Yes 1 No 2 Don't know 88 No response 99	→ **6.21**
6.19	If yes when was the last time you were tested?	Less than 12 months ago 1 1 to 2 years ago 2 2 or more years ago 3 Don't know 88 No response 99	
6.20	What was your test Result? - ***You do not have to share this if you are not comfortable***	Positive 1 Negative 2 Don't know 88 No response 99	
6.21	If you were HIV positive do you think that you would feel comfortable disclosing your status in the prison?	Yes 1 No 2 No response 99	
6.22	Have you seen HIV/AIDS services or activities in this prison?	Yes 1 No 2 Don't know 88	→ **6.24**

6.23	What activities or services have you seen? ***Answer yes/no for each service***	(a) Education - Yes 1 No 2 (b) HIV Testing - Yes 1 No 2 (c) Treatment - Yes 1 No 2 (d) Support Groups - Yes 1 No 2 No response 99	
6.24	Do you need information about HIV/AIDS in the prison?	Yes 1 No 2 Don't know 88 No response 99	
6.25	Do you need information about other health issues in the prison?	Yes 1 No 2 Don't know 88 No response 99	
6.26	Do you need access to free condoms in the prison?	Yes 1 No 2 Don't know 88 No response 99	
6.27	What would you recommend to help reduce the risk of HIV in this prison? ***Multiple responses possible.***	Better access to condoms 1 Access to clean needles 2 Access to razor blades so not share 3 Educational sessions 4 Educational leaflets 5 Prevent forced Sex from happening 6 Other..... 7	
6.28	What are the common diseases/ illness' in this prison? ***Read out each answer.*** ***Tick number if 'yes'*** ***Multiple responses allowed***	Headache / fever 1 Skin diseases / rashes 2 Stomach pains/ lower abdominal pains 3 Menstrual pains/cramps 4 Diarrhea 5 Other …….. 6 Don't know 88 No response 99	

6.29	Have you ever been sick since you were incarcerated?	Yes 1 No 2 Don't know 88 No Response 99	→ **6.32**
6.30	Did you seek medical help / advice	Yes 1 No 2 Don't know 88 No Response 99	→ **6.32**
6.31	Where did you seek medical help / advice	Prison medical services / clinic 1 Hospital 2 Prison staff/ officer 3 Another inmate 4 Other……..5 No response 99	
6.32	Is there access to sanitary pads / toiletries in this prison?	Yes 1 No 2 Don't know 88 No Response 99	→ **7.0**
6.33	How often are you been provided with sanitary pads / toiletries?	Every week 1 Every month 2 Few times a year 3 Less than every year 4 Don't know 88 No response 99	
7.0	**<u>SECTION 8</u>: PERSONAL HIV PERCEPTION RISK**	**am going to ask you some questions about your HIV risk perception. Please just say exactly how you feel**	
7.1	How would you rate your chances of getting HIV before coming to prison? (the virus that causes AIDS)	At no risk 1 At low risk 2 At high risk 3 Already have HIV 88 No response 99	→ **7.4**

7.2	How would you rate your chances of getting HIV in prison? (the virus that causes AIDS)	At no risk 1 At low risk 2 At high risk 3 Already have HIV 88 No response 99	
7.3	What are you doing to protect yourself from getting HIV in prison?	Do not share razor blades and needles 1 Use a condom 2 Abstain from sex 3 Other…… 4 Nothing 88 No response 99	
7.4	How many people do you think have HIV in this prison? *Read out each answer* *Tick number if 'yes'*	One inmate out of two 1 One inmate out of five 2 One inmate out of ten 3 One inmate out of twenty-five 4 One inmate out of hundred 5 Other……6 Don't know 88 No response 99	
Comments on interview:			

Time Finished: .

Thank you for your help in answering this questionnaire.

Appendix III: Ethical Approval (Bielefeld University)

Universität Bielefeld **Ethik-Kommission**

Ethik-Kommission der Universität Bielefeld
Postfach 10 01 31 | D-33501 Bielefeld

Der Vorsitzende

Geschäftsstelle:
Fatma Akkaya-Willis
Raum: T5-239
Tel.: 0521 106-4436
ethikkommission@uni-bielefeld.de
Az.: 1266
Bielefeld, 27.06.2017

Stellungnahme der Ethik-Kommission der Universität Bielefeld zu Antrag Nr. 2017 - 062W1 vom 31.05.2017

Kurzbezeichnung der Studie:
Perceptions of personal risk of HIV infection among female prisoners in Ghana

Hauptansprechpartnerin: Sheila Atogiba
Betreuer: Alexander Krämer

Die Ethikkommission der Universität Bielefeld hat den Antrag nach den ethischen Richtlinien der Deutschen Gesellschaft für Psychologie e.V. und des Berufsverbands Deutscher Psychologinnen und Psychologen e.V. begutachtet. Sie hält die Durchführung der Studie auf der Grundlage der eingereichten Unterlagen für ethisch unbedenklich.

Für die Ethik-Kommission

Prof. Dr. Gerd Bohner
Vorsitzender

Appendix IV: Ethical Approval (Ghana Health Service)

GHANA HEALTH SERVICE ETHICS REVIEW COMMITTEE

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

Research & Development Division
Ghana Health Service
P. O. Box MB 190
Accra
Tel: +233-302-681109
Fax + 233-302-685424
Email: ghserc@gmail.com
26th October, 2017

*MyRef. GHS/RDD/ERC/Admin/App/*815
Your Ref. No.

Sheila Atogiba
University of Bielefeld
School of Public Health
Bielefeld, Germany

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

GHS-ERC Number	**GHS-ERC: 016/09/17**
Project Title	Perceptions of Personal Risk of HIV Infection among Female Prisoners in Ghana
Approval Date	25th October, 2017
Expiry Date	24th October, 2018
GHS-ERC Decision	**Approved**

This approval requires the following from the Principal Investigator

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

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

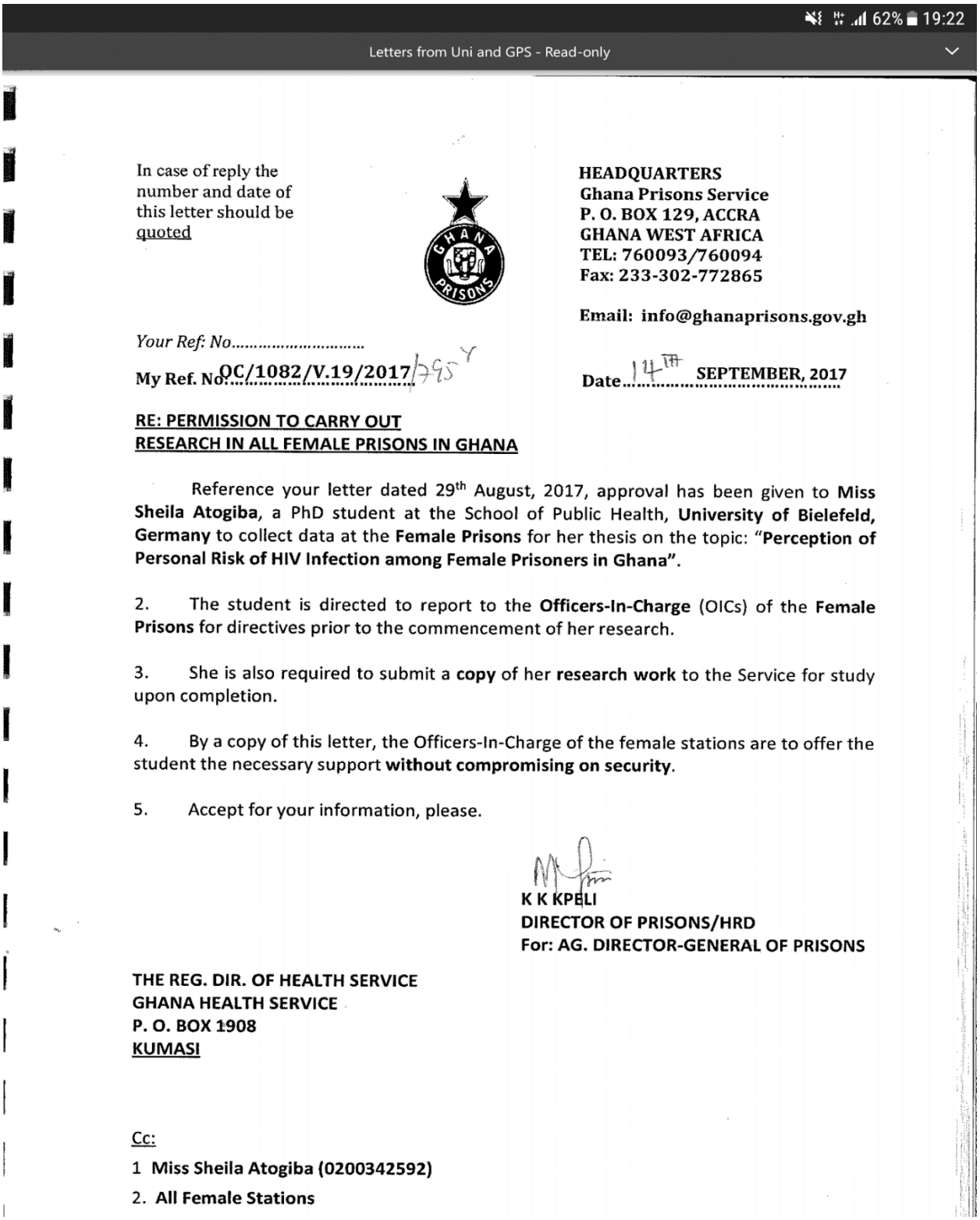
The ERC may observe or cause to be observed procedures and records of the study during and after implementation.

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

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

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

Appendix V: Research Authorization



Letters from Uni and GPS - Read-only

In case of reply the number and date of this letter should be quoted

HEADQUARTERS
Ghana Prisons Service
P. O. BOX 129, ACCRA
GHANA WEST AFRICA
TEL: 760093/760094
Fax: 233-302-772865

Email: info@ghanaprisons.gov.gh

Your Ref: No.....

My Ref. No. OC/1082/V.19/2017/795

Date 14TH **SEPTEMBER, 2017**

RE: PERMISSION TO CARRY OUT RESEARCH IN ALL FEMALE PRISONS IN GHANA

Reference your letter dated 29th August, 2017, approval has been given to **Miss Sheila Atogiba**, a PhD student at the School of Public Health, **University of Bielefeld, Germany** to collect data at the **Female Prisons** for her thesis on the topic: "**Perception of Personal Risk of HIV Infection among Female Prisoners in Ghana**".

2. The student is directed to report to the **Officers-In-Charge** (OICs) of the **Female Prisons** for directives prior to the commencement of her research.

3. She is also required to submit a **copy** of her **research work** to the Service for study upon completion.

4. By a copy of this letter, the Officers-In-Charge of the female stations are to offer the student the necessary support **without compromising on security**.

5. Accept for your information, please.

K K KPELI
DIRECTOR OF PRISONS/HRD
For: AG. DIRECTOR-GENERAL OF PRISONS

THE REG. DIR. OF HEALTH SERVICE
GHANA HEALTH SERVICE
P. O. BOX 1908
KUMASI

Cc:

1 **Miss Sheila Atogiba (0200342592)**

2. **All Female Stations**

Appendix V: Time Schedule and Workplan

Year\Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
2015	Language course				Literature search and draft literature review write -up			Finalization of exposé Participated in teaching programme (doctoral block) and submitted Qualifying Paper (QP) on exposé				
2016	Participated in teaching programme (doctoral blocks) Submitted QP on Research methodology Developed research questions Submitted QP on research objectives and questions				Submitted QP on Public health relevance Submitted QP on methodological approaches Designed first draft of questionnaire			Phase I of field work in Ghana- Preparatory visit to Ghana Applied of ethical clearance to conduct research Submitted QP on theoretical framework				
2017	Developed final research questionnaire Submitted QP on research questionnaire				Pre-tested research questionnaire in Ghana Data entry, data cleanings and analysis Submitted QP on results from pretest Revised research questionnaire with supervisors							
2018	Submitted QP on research process Final data collection in Ghana				Data entry, data cleanings and analysis Submitted QP on data collection and analysis							
2019	Final data analysis				Evaluation of findings Discussion of research findings with supervisors Write-up of research results							
2020 2021	Draft dissertation write-up in consultation with supervisors & Journal publications Review and submission of dissertation				Draft dissertation write-up in consultation with supervisors Submitted draft dissertation to supervisors Correction and oral defense							

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