

THE UNIVERSITY OF HULL

**A mixed methods study of the factors
associated with HIV testing uptake
among young people in Saudi Arabia**

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The University of Hull

By

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Abstract

Background

Despite recent progress in enhancing the accessibility of HIV-related health services worldwide, opportunities to diagnose patients are often missed due to genuine barriers at different levels. The aim of this study is to explore the factors that affect the uptake of HIV testing by young people in Saudi Arabia.

Methods

A sequential mixed methods design was used to reveal the factors that influenced HIV testing among young people aged 17-25 years. In terms of the quantitative strand of the study, a descriptive cross-sectional design was applied to identify the relevant and context-specific factors that influenced HIV testing among Umm- Al Qura University students. The students were selected using a convenience sampling technique. Self-completed online questionnaire was used. The questionnaire consisted of 52 items: 12 items for HIV/AIDS-related knowledge, 3 items for risk perception, and 37 items for attitudes toward HIV testing. For the qualitative strand of the study, semi-structured interviews were used to gather the perspectives of healthcare professionals working in the field of HIV/AIDS in the country.

Results

Three hundred and ninety four participants completed the questionnaire: 116 (29.4%) male and 278 (70%) female. 50.5% of the participants were aged from 20 to 22 years, 34.8% were 17-19 years and 14.7% were aged between 23-25 years. Only 20 (6%) participants had previously been tested for HIV. The main reasons for not being tested for HIV were: exposure to HIV was considered unlikely (48%), the HIV test was not offered (36%), and a lack of awareness of the locations of HIV testing centres (16%).

With regard to HIV/AIDS-related knowledge, the male participants scored higher than the females as the mean score for males was ($M = 6.4, SD = 2.4$) while for females it was ($M = 5.7, SD = 2.5$); however, this difference was not significant. In terms of risk perception, female participants had lower levels of risk perception than male participants, with the mean score for males being ($M = 11.7, SD = 2.5$) and ($M = 10.5, SD = 2.4$) for females; this difference was statistically significant $p < 0.01$. The female participants showed slightly more positive attitudes towards HIV testing than male participants: the mean score for males was ($M = 108.14, SD = 17.9$) and was ($M = 111.32, SD = 17.3$) for females. However, this difference was not significant. Healthcare professionals who were interviewed indicated stigma, an HIV/AIDS knowledge gap and fear of the consequences of a positive result as the main factors hindering the uptake of the HIV test.

Conclusions

Knowledge, attitudes and HIV risk perception are critical factors that inform the decision to undertake HIV testing. However, socio-cultural constraints constitute a significant additional burden that hinders the efforts to scale up the HIV testing uptake in Saudi Arabia.

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Abbreviations

HIV:	Human Immunodeficiency Virus
AIDS:	Acquired Immunodeficiency Syndrome
UN:	United Nations
UNAIDS:	The Joint United Nations Programme on HIV/AIDS
MSM:	Men who have sex with men
SIV:	Simian Immunodeficiency Virus
GRID:	Gay-related immune deficiency
CD:	Cluster of differentiation
PrEP:	Pre-exposure prophylaxis
PEP:	Post-exposure prophylaxis
PITC:	Provider-initiated HIV testing and counselling
ARV:	Anti-retroviral
WHO:	World Health Organisation
TB:	Tuberculosis
HCPs:	Healthcare professionals
IDUs:	Injection drug users
PLHIV:	People living with HIV
STDs:	Sexual transmitted diseases
STIs:	Sexual transmitted infections
VCT:	Voluntary counselling and testing
NAP:	National AIDS Programme
GASTAT:	General Authority for Statistics
MENA:	Middle East and North Africa
CASP:	Critical Appraisal Skills Programme
ARRM:	AIDS Risk Reduction Model
HBM:	Health Belief Model
TRA:	Theory of Reasoned Action
TPB:	Theory of Planned Behaviour
MDGs:	Millennium development goals
FGDs:	Focus group discussions

1 Introductory Chapter

1.1 Introduction

This chapter aims to introduce the thesis and offer a brief description of what follows in subsequent chapters. This chapter includes a concise introduction to the topic and also introduces the setting; the general aim of the current research project and the study design are also briefly discussed. Finally, an outline of each chapter included in this thesis is offered.

1.2 The rationale for the current research

The future of any nation depends on the power of its youthful population. In this way, the status of a country's educational, political and financial systems, as well as the efficacy of its healthcare, can be seen as being advantageous or disadvantageous for young people (Lancet, 2012). The period of adolescence or young adulthood is a time in an individual's life that is full of adventure and discovery. This is the case, even with regard to the individual's own body, as this is the period of puberty when sexuality and all the related challenges begin to be prominent. Thus, at this age, individuals notice changes in their bodies and may attempt to explore these newly acquired features. As a result, their vulnerability to certain diseases, such as HIV and other sexually transmitted diseases, increases, as does the probability of other unwanted consequences, such as unintended pregnancies.

At this stage of human development, cultural values, societal norms and legal codes begin to have a direct impact on the individual's physical, psychological and social development processes. For example, what is considered acceptable in one society might be a crime in another. During this stage of life, the individual reaches the age of majority; this is seen as crossing the threshold to adulthood when an individual is legally liable for his/her own actions. It is also the stage at which an individual is able to consent to drinking

and smoking, and to embarking upon a sexual relationship. Thus, certain behaviours and practices, such as those related to sexuality, become more prevalent during adolescence and early adulthood and these pose a further risk, encouraging young adults to act in such a way that might be unlawful or place them in danger of contracting certain diseases, such as HIV. In addition, as mentioned earlier, these sexually related behaviours and practices are also greatly influenced by cultural values and regulated by specific laws. Certain sexually related behaviours and practices, such as homosexuality, for example, are considered unacceptable or even taboo in certain cultural settings across the globe and, as a result, these kinds of behaviour may be strongly stigmatised. Tackling a subject that is highly stigmatised is a challenging task which requires a full awareness of the socio-cultural context of the setting, as well as those factors which hamper responses in the defined setting and population.

Acquired Immune Deficiency Syndrome (AIDS) is a major health problem worldwide, with approximately 42 million people living with the virus. Each day, the number of young people and adolescents living with HIV increases by 2,100 (UNAIDS, 2014c). In 2013, of the four million people infected with HIV in the 15-24years age bracket, almost 30 percent were under the age of 19 (UNAIDS, 2014b). Low and middle income countries have the greatest number of cases, with a large proportion (85 percent) occurring in the Sub-Saharan region. The population in this region has a high proportion of young people, and this is likely to continue to rise until 2050 (Idele et al., 2014). In South Sudan, for instance, over half the population is under the age of 18 (UNAIDS, 2013). This means that the HIV infection rate among young people, which is already high, is likely to increase. Although there has been an overall 30 percent drop in the number of people living with HIV, the number of adolescents who died from the disease increased by 50 percent during the 7-year period from 2005 to 2012 (UNICEF, 2013).

Of the regions with the most rapidly growing HIV epidemics, the Middle East and North Africa (MENA) region is one of the two highest; this region is considered high-risk as it is highly susceptible to the spread of AIDS (UNAIDS, 2014a). Although there are significant variations across the region with regard to epidemiological patterns, trends and typologies, the severity of the epidemic is increasing due to the infection becoming more widespread, with the number of new cases increasing and more deaths occurring due to AIDS-related disease. According to UNAIDS (2014a), the number of people infected with HIV during 2013 was in excess of 25,000. This was a 7 percent increase from levels in 2005, bringing the total number of people in the region living with HIV to nearly a quarter of a million [CI: 160,000-330,000]. At the same time, the number of AIDS-related deaths in the region rose by 66 percent, bringing the total to 21,000 infected individuals (UNAIDS, 2014a).

The significance of this for children and adolescents is a major concern worldwide. In the MENA region, the number of cases of childhood HIV infections increased by 2,300 [CI: 1,500–3,400] in 2013 (UNAIDS, 2014a). The test-rate for new-borns with mothers who had HIV was very low at 19 percent [12%–31%] while only 15 percent [CI: 11%–21%] of children who had been diagnosed received anti-retroviral therapy (ART). More than one and a half thousand children died from AIDS-related causes during this period. At the same time, the number of HIV cases among adolescents between the ages of 10 and 19 increased by 5,400, bringing the total to 20,000 (UNICEF, 2014). The number of cases is expected to continue to increase due to a number of factors; these include:

1. Poor education with regard to HIV and AIDS. Only 2 percent of young women (aged 15-24) in Yemen, 3 percent in Iraq, 3 percent in Egypt, 5 percent in Palestine, 6 percent in Jordan, 6 percent in Syria and 8.5 percent in Sudan were found to be sufficiently educated (UNICEF/MICS, 2014).
2. Greater risk-taking by young people.

3. Inadequate youth services and support with regard to the availability, accessibility and use of HIV related healthcare services such as HIV testing. Only 0.2 percent of young women (aged 15-24) who had been tested for HIV in Qatar actually knew the results of their tests. This figure was 0.5 percent in Tunisia and 1.6 percent in Algeria (UNICEF/MICS, 2014).

Central to this problem is the level of testing for HIV. This has increased in its coverage, particularly in countries with high levels of infection, but there remain significant barriers to participation (Bajunirwe and Muzoora, 2005, Carr and Gramling, 2004). This is a significant issue as testing can prove important. Not only can it help prevent further transmission of the virus, it can also help in effective treatment being provided to the sufferer (Deblonde et al., 2010). Thus, establishing what these barriers are and exploring effective ways in which they can be overcome is of paramount importance, both to treat HIV-infected patients and prevent HIV transmission. The literature reveals that there is a number of general factors that influence an individual's HIV testing seeking behaviour. The effects of these factors have resulted in non-testing, or late testing. Many studies have illustrated certain fundamental difficulties in this regard, with opposition coming at a policy level and in the establishment of effective resources. Low levels of HIV testing have emerged as a worldwide problem as similar issues have been reported by many different nations; however, distinct issues across and within nations are also reported. Differences with regard to the HIV epidemics, cultural and societal norms, drive the variations of those factors which influence HIV testing in particular nation states.

1.3 The research setting

The prevalence of HIV in Saudi Arabia is currently low. Despite this, there are Saudi communities that are considered to be at high risk of acquiring the infection. The prevalence of HIV is greater within large urban cities in Saudi Arabia and there is also a higher prevalence among men in comparison to women. Reports have indicated that the

MENA region is experiencing an increased incidence of HIV (Setayesh et al., 2014). In the Kingdom of Saudi Arabia, most means of transmitting HIV are stigmatised. However, the government is actively seeking to develop programmes to promote education and awareness regarding HIV. Nevertheless, the lack of research in the area of HIV/AIDS in Saudi Arabia has resulted in the application of imported policies and guidelines which may be unsuitable for Saudi Arabia in tackling HIV/AIDS. Thus, conducting research in the field of HIV/AIDS within Saudi Arabia is the first effective step in controlling the disease through contextual, evidence-based strategies.

1.4 The general aim of the research

Efforts to combat HIV/AIDS epidemics, need to be contextual as variations in terms of epidemiological patterns, socio-cultural backgrounds and resources exist across and within nations. It is clear, that it is important to maximise the effectiveness of HIV testing.

The main aim of the current study is to identify those factors that influence HIV testing seeking behaviours of young people in Saudi Arabia.

1.5 The study design

Exploring the factors that influence the uptake of HIV testing among young people in Saudi Arabia is a challenging task as the problem is multifaceted. In addition, the nature of HIV testing behaviour requires interactions between the HIV test seekers and the providers while the high level of sensitivity attached to HIV/AIDS makes such interactions difficult to maintain. The factors that affect the uptake of HIV testing may be influenced by healthcare providers, society, healthcare systems, culture and/or the individual him/herself. Thus, for the purpose of the current study, an explanatory sequential mixed-method design was applied to address thoroughly the research problem and to explore the problem from both the perspective of young people and those who deliver HIV testing.

The target population of the current study is young people in Saudi Arabia and so the main part of the current study concerns young people. Data were gathered using a newly developed questionnaire to assess the main factors identified in the literature that potentially influence HIV testing. These factors included: HIV/AIDS related knowledge, HIV risk perception and attitude toward HIV testing. In addition, the participants were also able to offer feedback about their HIV testing experience via the questionnaire.

Following the collection of the questionnaire data, semi-structured interviews were held with healthcare professionals (HCPs) working in the field of HIV/AIDS in Saudi Arabia. The main purpose of these interviews was to explain the questionnaire findings and to explore the research problem from the perspective of health care staff. The role and the experience of HCPs working in the field of HIV/AIDS enabled them to add valuable information, which built on the data from the young people (*Further details can be found in Chapter 4*).

1.6 Outline of the chapters of this thesis

Chapter 1 offers a brief discussion concerning the research problem and the rationale for conducting the current research project. It also presents an overview of the general aims and the setting of the current research. Finally, an account of the research design adopted in the current study is briefly referred to.

Chapter 2 provides background information about HIV/AIDS in general and how the world is responding to its challenges. In this chapter, an overview is given of Saudi Arabia in terms of its geographical location, and certain historical and cultural issues. Finally, the policies and guidelines applied in Saudi Arabia to tackle problems related to HIV/AIDS are presented.

Chapter 3 begins with a narrative review of the literature that helped in forming and focusing the systematic literature review questions. Then, the protocol and the outcomes

from the systematic literature review concerning factors that influence HIV testing among adults aged 17 and above worldwide are presented. Finally, gaps in the literature are highlighted and a brief research purpose statement is given in order to clarify the research questions addressed in the current study.

Chapter 4 discusses the philosophical assumptions applied and the methodology adopted in the current study. In addition, the empirical methods used are also discussed and the process of the fieldwork and analysis are presented.

Chapter 5 presents in detail the findings of both strands of the study. The chapter begins by displaying the findings of the quantitative strand; these consist of the descriptive and inferential findings, as well as assessments of associations between certain variables. The chapter then presents a thematic analysis of the interviews with the healthcare professionals.

Chapter 6 discusses thoroughly the main findings from both strands in the light of the literature and theories. Each set of data is discussed independently so the main strand of the study, the findings from the quantitative strand, are discussed first, after which the main qualitative findings are explored. The chapter also presents an integration of both strands of the data to make sense of the whole picture of the current study. A quality assessment of the findings of the study, including issues related to reflexivity, is also offered in this chapter.

Chapter 7 provides a summary of the study and offers thoughts about the implications of the research in terms of practice, policy and future work. Finally, the chapter offers brief concluding remarks to draw the thesis to a close.

2 Background Chapter

2.1 Introduction

The human immunodeficiency virus (HIV) is associated with acquired immunodeficiency syndrome (AIDS), a condition which leads to the progressive failure of the immune system. Despite recent progress, HIV/AIDS is still a major worldwide public health concern with a substantial social, cultural and economic impact. Although the number of new infections is declining globally, significant geographic variations in terms of prevalence and epidemiological patterns are evident. In this chapter, a brief account of the history of HIV and the global response to the HIV endemic are reviewed. Then, a clinical overview of HIV/AIDS is given. The chapter also offers an epidemiological summary of HIV infections worldwide as well as in Saudi Arabia. Finally, a brief overview of Saudi Arabia, including geographical, cultural aspects and the national policies concerning HIV/AIDS, is presented.

2.2 History of HIV

Molecular evidence suggests that HIV originated in Sub-Saharan Africa after a closely-related virus, the Simian immunodeficiency virus (SIV), became adapted to replication in humans (Van Heuverswyn et al., 2006). According to most studies, SIV was transferred to humans during the late 19th or early 20th century (Santiago et al., 2005). Sequence data for HIV-1 and known mutation rates for the virus have been analysed to estimate the point at which HIV transferred from chimpanzees into humans. These estimates place the transfer event during the late 19th or early 20th century, at a time when sub-Saharan Africa was being rapidly colonised (Korber et al., 2000). The most commonly reported theory of the cause of this transfer is termed the ‘natural transfer theory’. This describes the viral transfer from an infected ape or monkey to humans through either an animal bite or from a cut during the butchering of ape meat. Immunogenic evidence from existing

African tribes that commonly butcher apes reveals Sero-reactivity to antigens of SIV, indicating that SIV transfer to humans is possible through close association with apes. The proportion of the population containing antibodies to SIV varies according to country and lifestyle, with incidences as high as 17.1 percent, found in bush meat-hunting populations in Cameroon (Kalish et al., 2005). Although the exact mode of the first HIV transmission has not been fully elucidated, it is clear that a relatively high viral titre would have been required for HIV to become established, and human host adaptation would require rapid mutation under a strong natural selection pressure (Santiago et al., 2005).

The process of HIV testing started soon after the virus was isolated at the Institute Pasteur in 1983 (Barré-Sinoussi et al., 1983). In the same year, *in vitro* studies began to cultivate the virus and commence human testing. However, testing was not effectively realised as a preventive strategy until the availability of effective antiretroviral drugs. According to World Health Organisation (WHO) data, 95 million people in 119 countries have been tested for HIV (WHO, 2013). International organisations (e.g. WHO and the UN) have encouraged a broad policy of HIV testing in all countries with a high incidence of HIV and for at-risk individuals.

2.3 The global response to the HIV endemic

Since the beginning of the HIV epidemic, the global response has distinguished HIV from other sexually transmitted disease. Efforts to tackle HIV have moved through various stages and have involved governmental and non-governmental organisations working together to control the endemic. WHO established the first global programme on AIDS in 1987. Despite the global understanding of the complexity of the HIV/AIDS pandemic, which was improved by the formation of UNAIDS in 1994 to provide a more comprehensive response, the lack of clarity and an inadequate global response management prevented UNAIDS from achieving its goals for the first two decades. This failure was attributed to the diversity of cultural understandings of HIV, difficulties in

collecting information about the situation worldwide, and a lack of adequate funding. In addition, incoherent responses were evident in both global and national policies to contain the pandemic. In the USA, the disease was linked to homosexuality, with the frequent use of the term GRID (gay-related immune deficiency) by the media and healthcare professionals. On the other hand, repressive policies were implemented in other countries to control the spread of the disease. For example, in Russia, tight immigration control was applied. Other countries such as Saudi Arabia, deported immigrants based on their HIV sero-status to control the spread of HIV. Bonacci (1992) claimed that the lack of commitment and adherence to policy were due to governments' resistance and their denial of the idea that HIV posed a threat, not only to a particular nation, but to the whole world. Cultural differences across nations and communities within nations complicated the response to combat HIV/AIDS. In the first gathering held by the General Assembly of the UN in June 2001, a gathering intended to discuss the future of the disease, the central focus was funding allocations, as well as cultural aspects that hindered prevention activities. The meeting concluded that cultural diversity should be respected and tolerated when designing future preventive programmes. In addition, nations have been affected by the pandemic to different degrees, and the impact of the disease on social, cultural and economic structures has varied considerably across nations. Accordingly, using one of them as a model for the whole world, might lead to inaccurate conclusions. Therefore, UNAIDS and WHO highlighted the necessity "to tailor prevention strategies to local needs but also the importance of decentralizing AIDS responses" (UNAIDS/WHO, 2009:9).

Three decades after the start of the HIV/AIDS pandemic, there was a need to revise and revisit the preventive strategy and response to the pandemic. Advancements in biomedical and behavioural prevention intervention encouraged actors at all levels to move beyond the emergency response. Auerbach et al. (2011) highlighted that efforts to tackle

HIV/AIDS required a comprehensive, long-term approach. The new approaches needed to be designed and implemented following engagement with the social structure of the setting and population being addressed (Auerbach et al., 2011).

2.4 HIV/AIDS clinical overview

HIV infects cells of the immune system and thereby weakens them, leading to uncontrolled opportunistic infections and the development of cancer, which eventually causes the patient's death (Feinberg and McLean, 1997, Weiss, 1993, Cáceres et al., 2010). AIDS refers to the severe end-stage progression of HIV infection manifested by the development of opportunistic infections and rare cancers. It is believed that almost 50 percent of infected individuals will develop AIDS 10 years from the onset of infection if they are not on effective treatments. The virus targets a range of immune cells; however, it is hallmarked by invading T cells, leading to a reduction in the number of CD4+ T cells.

2.4.1 Mode of transmission

HIV infection occurs through the transfer of bodily fluids between individuals. Infection may involve an exchange of blood, semen, vaginal fluid (UNAIDS & WHO, 1997) or breast milk (Kutty, 2012). However, these HIV-contaminated bodily fluids require direct contact with the mucus membrane or any damaged tissues of the individual for infection to occur. It is also possible for HIV to enter the bloodstream directly through using contaminated needles, which is not an uncommon mode of transmission of HIV, especially among those injecting illicit drugs. Once infection occurs, HIV may exist freely within the body or within 'hijacked' immune cells (Abbas and Herbein, 2013).

Globally, the most common modes of transmission are unprotected sexual intercourse, both anal and vaginal, and the sharing of injecting objects, such as needles and syringes. In addition, mother-to-child HIV transmission is a common mode of HIV transmission. HIV can be transmitted from an infected mother to her child at different stages, for instance, during pregnancy, at birth or while breastfeeding. However, infected mothers

on regular HIV treatment are at a lower risk of infecting their baby. It is also worth noting that accidental pricks with HIV-contaminated needles or cuts with sharp objects appear to be common modes of transmission among healthcare workers.

There are several extremely rare modes of HIV transmission, such as receiving blood and blood products, or organ transplants. Although these were a common mode of HIV transmission in the early days of HIV epidemics, rigorous and strict screening guidelines of the donated blood and its products have lowered the risk of HIV transmission through this mode. Other rare modes of transmission include oral sex, contact between wounds, and deep open-mouth kissing if both persons have sores or bleeding gums.

2.4.2 HIV diagnosis

HIV diagnoses typically involve blood tests for specific antibodies, which are present in the blood six weeks to three months after HIV infection (UNAIDS & WHO, 1997). There are limitations to antibody testing, the most important of which is the presence of false negative results that occur during the so-called ‘window period’, representing an interval of three weeks to six months after the initial infection with HIV but before a detectable concentration of anti-HIV antibodies is present in the blood. Furthermore, if a patient begins ARV treatment, antibodies are unlikely to be present until around 12 months post-infection (Kwong et al., 2012). During the window period, infected individuals can pass on HIV to others even though the infection cannot be detected by antibodies.

It should be noted too that antibody tests with patients younger than 18 months are considered inaccurate as maternal antibodies are still present (Kellerman and Essajee, 2010). In these young patients, an HIV diagnosis can only be made by molecular testing of the viral nucleic acids. In many developing countries where HIV is prevalent molecular testing for HIV is not common due to a lack of resources. Clinics, therefore, rely on

immunogenic testing outside of the window period, which can often lead to delayed diagnosis and treatment.

- Enzyme-linked immunosorbent assay (ELISA) testing

The ELISA technique is used routinely for screening of HIV due to its high sensitivity. The test involves taking a sample of a patient's serum and adding this to a plate containing HIV antigens. If the serum contains antibodies to HIV, these will bind to the antigens in vitro. A secondary antibody is then added, which binds to the anti-HIV antibody. The secondary antibody is generally bound to an enzyme and after addition of a suitable substrate, a detectable colour or fluorescence change occurs, indicating a positive result. ELISA tests are quantitative, as the degree of enzyme-mediated colour or fluorescence change is proportional to the amount of antibody present in the serum.

It should be noted that positive results from ELISA screening does not necessarily indicate the presence of HIV. False positive results are common in patients suffering from diseases such as lupus erythematosus (Esteva et al., 1992). Also, like general antibody tests, ELISA screening is susceptible to false negative results during the window period. Positive ELISA results are generally confirmed by Western blot analysis for the anti-HIV antibodies and are performed in selected referral laboratories (Madani et al., 2004).

2.4.3 Treatment

There are several classes of drugs used to treat HIV infections. These drugs function by interfering with the viral replication machinery, either at the nucleic acid or protein level. Together these therapeutic drugs are termed anti-retroviral (ARV) treatments and usually involve the combinational use of nucleoside reverse transcriptase inhibitors, protease inhibitors and non-nucleoside reverse transcriptase inhibitors. Today, combinations of ARV treatments are routinely administered as early as possible after diagnosis to

minimise the viral load and to maintain the level of CD4+ immune cells in infected individuals.

2.4.4 Prevention

The idiom, 'prevention is better than a cure' is accurate in many health promotion activities across various health-related problems. In terms of HIV/AIDS, prevention is the only available option to protect individuals from being infected. Although there are effective treatments for HIV/AIDS, they are lifelong treatments that only control the disease, not cure it. HIV infections are mainly prevented through abstaining from practising HIV- risky behaviours, such as unprotected sexual intercourse with an unknown HIV status partner, injecting illicit drugs and having multiple sexual partners.

Knowing one's own HIV status is the first step towards taking further steps to protect oneself from acquiring an HIV infection and protecting others, such as sexual partners (Hankins and de Zaluondo, 2010). Behavioural HIV preventive measures also include using condoms during sexual intercourse, limiting the number of sexual partners and avoiding the sharing of needles or syringes for drug injection. In addition to the behavioural modification preventive strategies, there are biological and pharmacological preventive measures. For example, male circumcision proves to be effective in reducing the risk of HIV infection among uninfected men (Padian et al., 2008). In addition, pre- and post-exposure prophylaxis (PrEP and PEP) has proven to be effective in protecting individuals from acquiring HIV.

For approximately two decades, research groups have been working to develop a vaccine against HIV/AIDS. The lack of success in developing an effective vaccine for HIV is due to the genetic diversity and high mutation rates of HIV, which limits the effectiveness of any HIV vaccine. On the other hand, scientific advances in developing highly effective and safe drugs to treat HIV have led to the use of treatment as a measure of prevention.

Progress has been made in the use of preventative strategies to reduce the incidence of HIV/AIDS. These measures include: clinical developments, such as ARV drugs and topical microbicides; social programmes to encourage the use of prophylaxes during sexual intercourse; recommending male circumcision in HIV prevalent regions; and increased awareness and education to establish HIV testing facilities and promote safe sex.

2.5 HIV epidemiology

2.5.1 HIV/AIDS global overview

In 2014, 36.9 million people were believed to be suffering from HIV infection, leading to a global prevalence rate of 0.8 percent (Figure 1) and causing an estimated 1.2 million deaths worldwide (WHO, 2014). Of these estimated HIV cases, only around half were aware of their HIV status (UNAIDS, 2015). In 2015 there were an estimated 2.1 million new HIV infections worldwide, with 150,000 new infections identified in children. This prevalence of childhood HIV represented a reduction of 48 percent since 2010. In total, young people (aged 15–24 years) accounted for 40 percent of newly diagnosed HIV infections (UNAIDS, 2012).

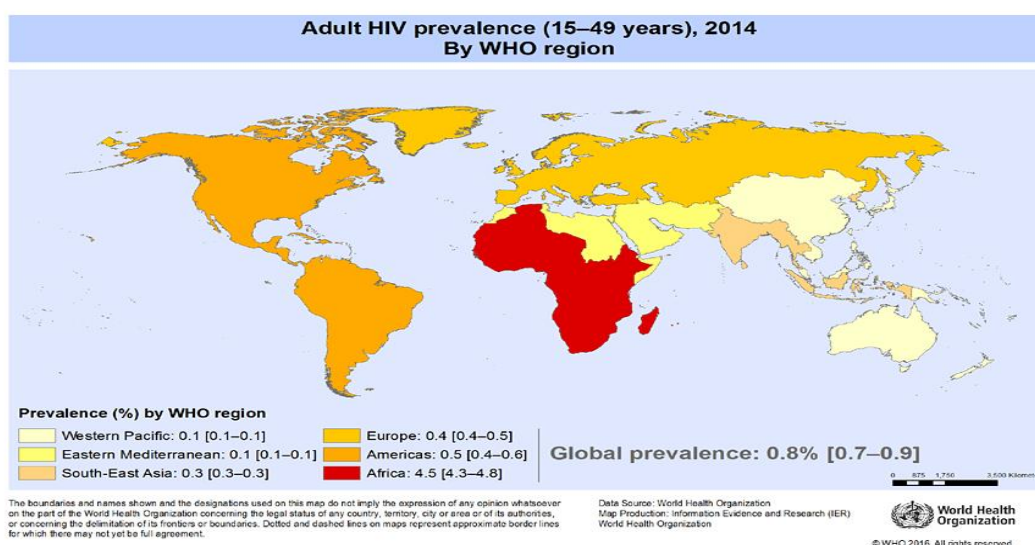


Figure 1: Worldwide HIV prevalence in adults. Taken from WHO (2014).

2.5.2 HIV/AIDS in Saudi Arabia and across the Middle East

In 2014 there were an estimated 230,000 cases of HIV in the Middle East and North Africa regions (UNAIDS, 2015) and, according to the United Nations (UN), over half a million people in the Arab region had an HIV infection (United Nations Development Programme, 2009). The data reveal that, in 2005, there were 67,000 new infections, resulting in 28,000 deaths. The WHO includes the Middle East in its ‘Eastern Mediterranean’ region, which had an average HIV prevalence of 0.2 percent (Figure 1). Based on population and HIV infection data from 2009 (Kabbash et al., 2012), Saudi Arabia had a HIV prevalence of 0.002 percent — one hundred-fold lower than the Eastern Mediterranean average. Further data on HIV/AIDS in these countries are limited, as religious and cultural considerations often prevent national authorities implementing effective systematic surveillance systems and awareness-raising campaigns (Shawky et al., 2009).

According to the UNAIDS/KSA report (2015), the prevalence of HIV was still low at that time, with approximately 1.5 new infections per 100,000 among Saudis and 1.2 per 10,000 among non-Saudis. The number of HIV cases in Saudi Arabia from 2000–2014 showed that both the incidence and prevalence in non-Saudis was higher than those of Saudis. However, the numbers of infected Saudi nationals rose significantly over this 14-year period (Figure 2).

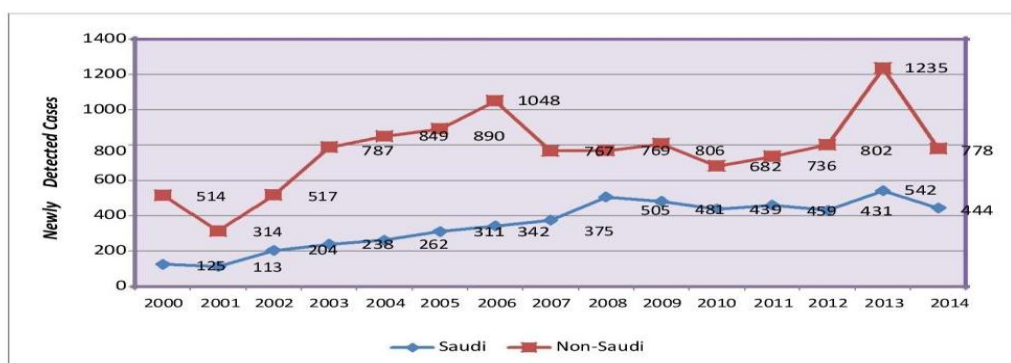


Figure 2: Reported HIV cases among Saudis and non-Saudis 2000–2014 (UNAIDS/KSA, 2015)

The most recent report on the HIV/AIDS situation in Saudi Arabia revealed that, since the identification of the first case of HIV in 1984 and until December 2014, the total number of HIV cases reported was 21,761 (UNAIDS/KSA, 2015). The report also showed that the reported number of HIV-infected Saudi nationals had increased considerably from only 125 individuals in 2000 to 444 in 2014. This official report also pointed out the limitation of its figures in describing the true picture of HIV/AIDS in Saudi Arabia, as it only included information from limited sources.

The study of Kabbash et al. (2012) identified 1,201 HIV infections specifically in Saudi Arabia in 2005, with 890 (74.1%) of those infections occurring in non-Saudi nationals. Over the 10-year period (2000–2009) investigated in the study, 10,217 cases of HIV were identified with 7,261 (71.1%) cases being found in non-Saudi nationals. Although higher, the cases of HIV in non-Saudi nationals decreased sharply in 2007 and remained at that level until 2009; in contrast, cases involving nationals increased steadily over the same period. The study identified some interesting gender differences between Saudi and non-Saudi nationals. There was a total of 2,956 HIV infections in Saudi nationals, with the vast majority (2,392; 80.9%) affecting males. This gender gap was much smaller in non-Saudi nationals, with 63.1 percent of cases involving males. It is also worth noting that there was a 4.7-fold increase in cases of HIV among Saudi women from 2000 until 2009, compared with a 1.5-fold increase for non-Saudi women over the same period. The trends and demographic data observed in Kabbash et al.'s (2012) study served to confirm earlier investigations, such as that of Al-Mazrou et al. (2005), which described increasing incidences of HIV/AIDS across Saudi Arabia since 2003. The study determined that 50 percent of Saudis infected with HIV were AIDS cases and established certain HIV-positive at-risk groups: men (77%), adults (15–49 years; 78%), and living in an area of a high prevalence of HIV: 67 percent of HIV cases were registered in Jeddah, Riyadh or

Dammam. The authors noted that HIV/AIDS was underreported in Saudi Arabia and estimated cases were actually almost 1.5-times higher than those officially reported.

Taken together, the data in these studies and official reports suggest a cultural change over the last decade among the Saudi Arabian population which is increasing the risk of HIV infections. UN data supported this assertion, claiming that women were increasingly vulnerable to HIV infection since they made up over half of all people living with HIV/AIDS (United Nations Development Programme, 2009). The organisation also claimed that four out of five women infected in the Arab region were infected by their husbands, suggesting sexual intercourse as the primary mode of HIV transmission and highlighting a possible change in cultural behaviour towards pre-marital or extra-marital sex by Saudi men in recent years. This assertion has been supported by a recent study involving 225 volunteers in Riyadh city, which found that 31 percent had engaged in premarital sexual activity at least once (Raheel et al., 2013). The authors also highlighted the apparent lack of knowledge of sexually transmitted infections (STIs) (including HIV) exhibited by the participants. This lack of knowledge concerning the transmission of STIs has been underpinned by the rapid increase in infections of HIV since the first reported case in 1984. The predominant mode of infection has also changed from transfusions using contaminated blood to heterosexual intercourse (Alrajhi, 2004). Health surveillance programmes conducted by international organisations broadly support the data from Kabbash et al. (2012), with 6,046 infections confirmed in the 18-year period from 1984 to 2001, predominantly affecting men aged 20–40 years (53.4% in both groups) (Madani et al., 2004). UN data identified Jeddah as having the highest incidence of HIV, with the city accounting for 15 percent of all HIV cases in Saudi Arabia. HIV was primarily transmitted through sexual intercourse (78.4%) rather than through the transfusion of infected blood (21.6%). In accordance with both the study of Kabbash et al. (2012) and official reports (UNAIDS/KSA, 2015), the UN identified that the vast majority of infected

persons were male (75%) rather than female (25%) (United Nations Development Programme, 2009).

Despite the growing prevalence of HIV in Saudi Arabia, only 5 percent of those infected were able to access basic antiretroviral (ARV) treatment (United Nations Development Programme, 2009). The recent report by the Ministry of Health published by UNAIDS (2015) indicated that in 2014, 30,094 people living with HIV (PLWH) in Saudi Arabia were on regular ARV drugs (Figure 3). In the past, this lack of uptake of ARV drugs had been attributed to cultural attitudes, reflecting the way in which the subject was taboo in Saudi Arabia with few people considering being tested for HIV or receiving counselling at a sexual health clinic. Individuals believed to be infected with HIV/AIDS were often stigmatised. The UN claims that these attitudes are changing gradually as a result of government intervention and the publication of HIV statistics both from within Saudi Arabia and across the Middle East region. In addition, medical care, including ARV drugs, has been made freely available to HIV-positive Saudi nationals. Although encouraging, the vast majority of those in Saudi Arabia with HIV/AIDS are non-nationals who are not eligible for free healthcare and therefore represent a transmission risk.

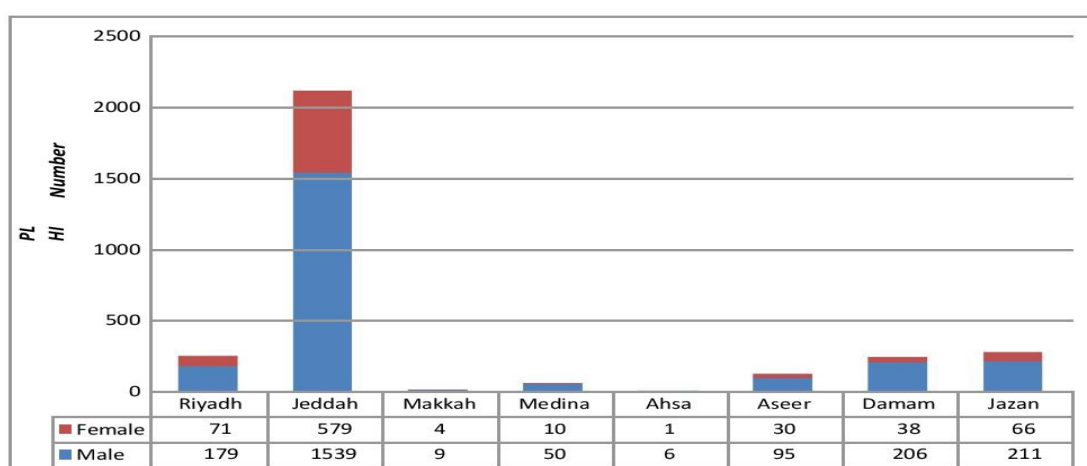


Figure 3: Total Number of PLWH on Regular ARV Treatment in 2014 (UNAIDS/KSA, 2015)

2.6 Saudi Arabia at a glance

2.6.1 A synopsis of the history and geography of the Kingdom of Saudi Arabia

Saudi Arabia, which takes up most of the Arabian Peninsula, is situated in Southwest Asia surrounded on its northern border by Jordan, Kuwait and Iraq, on its southern border by Yemen and the Sultanate of Oman, on its eastern border by the Arabian Gulf, Qatar, Bahrain and United Arab Emirates, and on the west by the Red Sea. It occupies about 2.3 million square kilometres and has a number of different cities and districts, as well as five significant regions, as follows: the north region, which is close to Jordan and Iraq; the south region, which borders on Yemen; the east region containing the Saudi oil fields and industries; the west region named Al Hejaz, which contains the holy cities of Makkah and Madina; and the central region, Najd, in which the capital, Riyadh, is situated (Mead, 2007). According to the General Authority for statistics (GASTAT), the total population of Saudi Arabia is around 27 million (GASTAT, 2010). Among the 27 million, approximately 69 percent are Saudi nationals. About 51 percent of the population in Saudi Arabia is 15–39 years of age.

2.6.2 Historical and traditional overview of the research's geographical setting

Hejaz is situated in the Red Sea area. According to Mead (2007) and Yamani (2008), there are numerous old sea trade routes between AlSham in Syria to the north and Al Yaman in Yemen to the south; thus, it has always been and still is a busy commercial region. The largest city in Hejaz is Jeddah, which is located in the western region (as noted above). Jeddah holds a special significance for Muslims all over the world due to its location and links with the Islam holy cities. Al-Rasheed (2010) noted that it was due to these links that it was targeted for capture over the centuries and from 1517 until 1926 it was part of the Ottoman Empire.

The Hejazi society has a more diverse background compared to Najd, with Bedouin and urban Badow and Haddar (Al-Rasheed (2010). Ménoret (2005) noted that there is a

number of very well-known Arab tribes with blood and family links with other tribes throughout the Kingdom of Saudi Arabia. As a result, they share many of each other's customs, exhibiting similar tribalism and, in some cases, fanaticism. In the cities, however, there is a more diverse spread of ethnic Muslim groups, many of whom originated from places such as Turkey, Africa, India, Iran and Asia when they came to perform the Hajj pilgrimage. Al-Rasheed (2010) noted that for over 400 years, the Ottoman rulers had a major influence on the region, imposing their own customs, traditions, doctrines, religious background, fashions, architecture and methods of construction; this had a major impact on the local population's lifestyle which is still evident today. Al-Rasheed (2010) also noted that the customs and traditions of Najd and Hejaz are still quite distinct. The Shaffei doctrine, which is a combination of Hanbali and other Islamic doctrines, was observed by Yamani (2008) as having originated from the period of Ottoman rule. Today there is a distinct difference between the Hejazi people and the rest of Saudi Arabia because the Hejazi continue to follow their earlier doctrine, rather than the official Hanbali doctrine (Yamani, 2008, Al-Rasheed, 2010, Ménoret, 2005).

It is clear that cultural and traditional diversity across Saudi Arabia, influences many aspects of citizens' daily lives. For instance, the Riyadh area is deemed to be more conservative and religious, and less liberal than Jeddah and the Eastern Province. Moreover, because Jeddah is close to the holy city of Makkah, many Muslims from different Islamic countries who have made pilgrimages to it have stayed and settled in the area. As a result, as noted by Yamani (2008), the customs and culture of the area are influenced by these groups. The lifestyles of the population in the Eastern province have also been influenced by the influx of US visitors and workers as compared to Riyadh. Furthermore, Facey et al. (2000) pointed out the Persian influence and the predominance of the Shiite creed which have had an effect on the socio-cultural context of the Eastern region of Saudi Arabia. Riyadh is different in that it has not been exposed to external

foreign pressures and does not have a variety of different ethnic backgrounds, as in Jeddah and the Eastern province. A comparison of various regions of Saudi Arabia creates an awareness of the differences and the fact that some of the most important cultural aspects of each region, such as religious background and traditions, can influence individuals' behaviours and attitudes in general; sexual issues are no exception.

2.6.3 Culture

The culture of any group of people is usually concerned with language, religion, cuisine, social habits, music and the arts. Rohner (1984) defined culture as the totality of comparable learning and meanings that a particular human population group maintains and transmits from one generation to the next. Tseng (2003) provided an additional definition of culture as referring to the unique behaviour and lifestyle common to a specific group of people and incorporating customs, habits, beliefs and values that shape emotions, behaviour and life patterns. Sue (1983) argued that sexuality has a significant effect on culture and ethnicity and, if this is not recognised, it threatens the reliability and validity of any conclusion that is applied to the general population. Social norms are the basis for the effect that culture has on individuals and groups regarding the basic inherent thoughts concerning ideal or acceptable personality. This, in turn, infers that the norms and values of a particular culture can play a part in the development of an individual's personality. Because of this, Tseng (2003) argued that, according to common socio-cultural criteria, most of the people in a specific culture have a desire to be their own culture's concept of an ideal person.

2.6.4 Cultural differences within Saudi Arabia

A. Family structure and gender issues

In Saudi, the tribal custom is to maintain very close family ties and links with the extended family, and this is predominant in the Najd area (Buchele, 2010). Buchele (2010) and Yamani (2008) suggested that advances in education, commercialisation and urbanisation

have contributed to the creation of new nuclear family structures whereby families prefer to live independently. While this is evident in all of Saudi Arabia, it is more obvious in the area of Hejaz. However, although individual families now live independently, the extended family ethos in Saudi is maintained. This is evident in the development of modern compounds, providing independence for younger families but preserving the links with other generations. Buchele (2010) and Yamani (2008) observed that these compounds are more prevalent in Najd and the Eastern province than in the Hejaz area.

The role of women in Islam, according to Hasna (2003), is of great importance both socially and culturally with their legal right to education, the right to contribute to decisions in most areas of life and the right to marry any man of their choosing, with or without parental consent. However, the tribal laws and customs have certain powers, and the fact that the society is very much male-dominated means that the interpretation of the Islamic policies and laws in such a patriarchal society can be somewhat restrictive, particularly to the disadvantage of women. This was observed by Hasna (2003) and Al-Rasheed (2010) in Saudi society, which is a mixture of Muslim and tribal values. Buchele (2010) noted this discrimination in the unequal application of Islamic law and the fact that it manifests itself in the preference of parents to have a male child, in the distribution of social roles and the lack of opportunities for females. Under tribal custom, it is considered shameful for a man if other people in a public place know his mother's, sister's and wife's names, so in a public place a man will refer to his wife as Um, or mother of, and then the son's name; if they do not have a son, then he will use his own father's name. This practice is very common in tribal society in Saudi and in particular in Najd (Buchele, 2010). Buchele (2010) also noted another particular custom that is specific to one Najdi tribe, whereby the female has to hide her face at all times, even from her husband and children.

B. Marriage and its related matters

Marriage between relatives, including first cousins or nearest friends, is the most common form of marriage in Saudi society and, because of the tribal customs and traditions, the marriage takes place within the same tribe or with another tribe that has close links (Buchele, 2010). It was noted by Al-Rasheed (2010) that male tribe members are empowered more than females to make their own marriage decisions and can refuse if the proposed bride is of low descent or the family origin is unknown. In Najd, for example, there is an inferred categorisation of members of the society into status groups according to origins and descent. Al-Rasheed (2010) described these as Qabali, someone belonging to one of the Arabic tribes, and Khudairi, someone with unknown tribal origin or unknown descent. Tribal custom dictates that people from these groups cannot intermarry; however, Islamic law forbids this type of discrimination. According to Yamani (2008), everyone is equal, no matter what their origins are. Yamani (2008) noted that this discrimination is customary in the Najd area where people refuse to marry people from the other Saudi regions, particularly those such as Hejaz where there are some non-Muslim tribes who would be forbidden to marry into a Najdi tribe.

Polygamous marriage in Saudi society is still widespread although there are differences between various areas. In the 19th century, women from Hejaz had the right to choose their own marriage partner, whereas in Najd they needed to have male guardians to oversee the selection and marriage process. Yamani (2008) noted that even now there are differences in marriage and divorce issues between Hejaz and Najd. In tribal societies, polygamy is more common in Najd than in Hejaz; as a result, there is less stigma associated with divorce in Najd than in Hejaz and more opportunity for a divorced woman to remarry in Najd than in Hejaz. The literature on polygamy and monogamy in Saudi Arabia seems to indicate that marriage patterns have changed throughout Saudi Arabia. These studies have shown that the polygamous marriage rates in both areas have

decreased. There is also a link between the level of education and urban living; this seems to indicate that city lifestyles promote monogamous marriages as the social norm. On the other hand, in terms of the Bedouin region, Yamani (2008) noted that polygamy is still regarded as the most common and natural social pattern of marriage. Al-Rasheed (2010) and Yamani (2008) noted that Hejaz people who are more likely to practice polygamous marriages, are either from the Bedouin section or, through work and life, have become inured to the Najdi lifestyle.

C. *Privacy*

Privacy is very important in Saudi society; this is evident in lifestyles and, in particular, in forms of accommodation where high walls enclose the houses and surroundings are built to prevent anyone from being able to see the family members, particularly the females. It was observed by Buchele (2010) that many households promote separation of the sexes by having two dining rooms and two living rooms. Facey et al. (2000) stated that this practice is more prevalent in Najd and the Eastern province where accommodations are similar and have been influenced by the Arabian Gulf countries. Ménoret (2005) noted that in the shopping malls, recreation centres and restaurants there are separate sections for males and females with families. Buchele (2010) also noted that the closeness of the friends and family unit is also evident in the way in which Saudis socialise, preferring family occasions rather than entertainment venues.

D. *Beliefs in relation to illness and diseases*

It is a Muslim belief that everything, including all bad and good events and circumstances, is the will of Allah. Therefore, people in Saudi Arabia generally believe that any diseases or disasters are part of their destiny. However, it is also common in Saudi society to believe in religious, magical and supernatural causes of disease. In their study, Alqahtani and Salmon (2008) found that southern Saudi patients and non-patients believed that their illness was the will of Allah sent to test or punish them, whereas the belief in the

supernatural, such as magic or evil eyes, was less widespread. Buchele (2010) noted that, because of the emergence of the multimedia society and freedom of speech, people are more openly discussing relevant social and cultural issues, such as unemployment, homosexuality, poverty, child abuse, polygamous marriage and the new pattern of marriage, the prevalence of divorce, and religious rigidity. Ménoret (2005), moreover, suggested that Saudi society is becoming more aware of concealed matters and topics that affect them.

2.6.5 Religious beliefs in Saudi Arabia

Looking at the formation of Saudi Arabia and its history, it is evident that Islam and Islamic leaders have been effectively assimilated with Saudi leaders. As a result, Islam has become an integral component of almost every facet of life in Saudi Arabia, as well as in its politics and policies. Thus, Arabic, which is the language of the Quran, is the official language and Islam is the most prevalent religion as well as being the official one. The majority of the Saudi population is Muslim, with any non-Muslims being made up of foreign workers with different religious beliefs. The Shariah or Islamic Jurisprudence has been used as the basis of the Saudi constitution and governance, as well as the Hadeeth (the sayings of Prophet Muhammad) and the Sunnah; this implementation of the Shariah has encouraged legitimacy and power for the Saudi state. The Shoura Council is the main Saudi assembly comprising Muslim scholars who are consulted on issues of law proposed by the Council of Ministers. They apply Sharia law to suggest changes that will allow them to conform to Islamic ideologies.

Every aspect of Saudi life, law and the state itself are pervaded by Islam and its roles and principles. This is based on the belief that it is one of the great monotheistic and Abrahamic religions, given to the people through the Prophet Muhammad who received his call to become a prophet in the Western Arabian city of Makkah.

A crucial component of the Saudi teaching curriculum is the five pillars of Islam, which make up the basic religious duties that every Muslim must carry out. The following quotation represents a summary on following the Hadeeth:

"Islam was built on the five, the testimony that there is no god but Allah and that Muhammad is the Messenger of Allah (Al-Shahadah), and held a prayer (Al-Salah), and the delivery of the zakat (Charity), fasting Ramadan (total abstinence from food, drink and sex, and avoid observing, speaking or listening to inappropriate things from sunrise until sunset), and visit the home (Makkah) for those who can afford (pilgrimage)". (Khan, 1997)

Saudi Arabia follows the interpretation of the Islamic religion based on the Wahhbian movement, which is itself based on religious beliefs derived from the Hanbali doctrine. The Wahhbian movement was instrumental in establishing the Kingdom of Saudi Arabia. In the present day, the majority of the population officially follows the Hanbali doctrine, which is deemed the most extreme and strict of all of the Islamic doctrines. According to Yamani (2008), this is because the Hanbali doctrine was the official doctrine of Saudi Arabia.

According to Islam, people need to maintain their health and consider it as a blessing from Allah to each person. The following represents the Hadeeth that Prophet Muhammad said: *"There are two blessings which many people do not appreciate: health and leisure time."* Islam provides guidance that has an impact on the health status of an individual, either directly or indirectly. Islamic teachings clearly promote healthy behaviours in general and do not ignore sexual health. For instance, HIV-risky behaviours, such as adultery, homosexuality and injecting illicit drugs, are forbidden. Sexuality, from the point view of Islam, is only considered from the point of view of marriage between men and women.

2.6.6 HIV/AIDS policy and guidelines in Saudi Arabia

Whilst HIV is clearly a health issue, it is important to recognise that it also has relevance in terms of its potential developmental and public health issues. Therefore, policies and guidelines developed to address HIV must also take these aspects into account, and this is often achieved through partnership with other appropriate programmes. Moreover, the programmes developed should be founded on evidence-based research to ensure their effectiveness. They should also receive appropriate evaluation and feedback in an effort to monitor continuously their validity.

A number of approaches are currently being used to reduce the incidence of HIV. For example, programmes are seeking to develop greater awareness of HIV within the current generation and are also trying to promote safe sexual practices. Programmes are also trying to remove incidences of HIV being transferred from mother to child and are offering both mobile and static testing units for people to become aware of their HIV status and take appropriate precautions. Moreover, steps are being taken to increase access to blood that is HIV free. For individuals who already have HIV, Anti-Retroviral Treatment (ART), as well as care or support services, are offered. According to the National AIDS Program (NAP), society as a whole must place greater emphasis on assisting individuals at risk of HIV. ART is an important treatment provision to improve the quality of life for individuals with HIV and therefore its accessibility must be increased; this should help to decrease the incidence of HIV (National AIDS Program KSA, 2014).

Blood and blood components received and stored by blood banks are carefully screened to ensure that they are safe, in accordance with the National Policy on Blood Banks. The National Policy on STI treatment also ensures that both Primary Healthcare facilities and hospitals are equipped to manage STI cases appropriately, with etiological case management in hospitals and syndromic approaches in primary healthcare.

Guidelines have also been developed to outline how ART centres should be operationalised and standardised, how STIs should be treated and managed, and VCT guidelines for clinics designated to provide care in this sector, both mobile and static.

A. National HIV/AIDS strategy

A National Strategy Plan, covering a period from 2013 to 2017, was developed to focus specifically on HIV/AIDS (UNAIDS/KSA, 2015). The purpose of this plan was to present policies and guidelines applicable to all individuals partaking in the provision of care or treatment for individuals with HIV/AIDS, and individuals working towards prevention.

Two predominant goals are outlined in the National Strategic Plan which specifically relate to minimising the incidence of HIV, and therefore the rate at which it spreads, as well as to minimise the current impact that AIDS has on society. These two goals are as follows:

- To stop any continued transmission of HIV within Saudi Arabia and ensure that the prevalence rates of HIV in at-risk individuals are maintained at less than 1 percent and less than 0.1 percent within the general population. This should be achieved by 2017.
- To ensure that individuals living with HIV have a high quality of life, healthcare and general wellbeing. This involves access to high quality specialised services, care and treatment.

In conjunction with the two goals outlined above, six strategic objectives were also outlined (UNAIDS/KSA, 2015). The focus of these objectives is to prioritise areas in need of attention following an analysis of the HIV situation and the effect of approaches thus far. These six strategic objectives are as follows:

- To ensure that strategic information relating to HIV/AIDS is readily available, shared effectively and efficiently utilised. This will be beneficial in ensuring that policies and programs implemented are evidence based;
- To ensure that the prevention services provided to individuals most at risk of HIV are improved in terms of quality and accessibility;
- To place greater emphasis on vulnerable groups when improving the overall quality of the HIV prevention services provided to the general population;
- To improve the overall quality of comprehensive treatment and care offered for PLHIV, whilst also improving the self-support and general support offered to ensure they reach international standards;
- To encourage the development of environments that are supportive socially, legally and in terms of policies. This will help to create a national response to HIV/AIDS. Specific focus should be on PLHIV and other at-risk populations;
- To ensure that the capacity is adequate in terms of technology, organisations and institutions to provide an appropriate response to HIV/AIDS that is multi-sectoral and decentralised. This will require coordination between all involved and the active use of monitoring and evaluation of policies to ensure effectiveness.

B. Saudi regional contributions

The Gulf Cooperation Council members have demonstrated that they are deeply committed to ensuring that HIV is appropriately responded to through the use of The April 2011 Riyadh Charter (National AIDS Program KSA, 2014). Within the Kingdom of Saudi Arabia, the Ministry of Health requested that each individual country in the Kingdom has a specified budget for the prevention of HIV and also for ensuring that individuals with HIV are appropriately cared for. Furthermore, they called for a unified Regional HIV/AIDS Strategy and emphasised its importance.

A common strategy was also suggested for the Arab region following a meeting of the Arab League during which both government and non-government individuals were asked to support the common strategy along with UN agencies, terming it “Uniting Arab Countries to Fight against AIDS”. This strategy was intended to be in conjunction with regional and global HIV/AIDS strategies. November 2011 also saw the presentation of the “Saudi Forum on HIV/AIDS” which is applicable to all Arab countries (National AIDS Program KSA, 2014).

In terms of the legalities of fighting HIV/AIDS, the human and civil rights of PLHIV are represented in a current by-law, specifically focussing on the right to employment, education and marriage. This by-law is currently being read by the “Shoura” council which is the Saudi parliament and the legislature.

2.7 Problem statement

Young people (aged 15–24 years) account for almost half of newly diagnosed HIV infections (UNAIDS, 2012). Therefore, it is particularly important that this demographic group continues to be tested and receive treatment. Data from the UN are encouraging regarding the reduction in the number of new infections in young people. The global incidence of childhood HIV infections decreased 43 percent between 2003 and 2011, with the most rapid reduction seen between 2009 and 2011. Acquired HIV infection has decreased mostly in the Caribbean (32%), Oceania (36%) and Latin America (24%), with Eastern Europe and Asia showing more modest decreases (13% each). However, North Africa and the Middle East are two regions where a decrease in HIV incidence in young people has not been observed (UNAIDS, 2012).

In these regions, a number of social factors remain that present a challenge to the population receiving HIV testing. There is a lack of knowledge of sexually transmitted infections in general in the region (Raheel et al., 2013) which may help to explain the

rapid increase in HIV infections over the past 30 years. In addition, the availability of some preventative strategies (e.g. contraception) is limited to married couples and accessible only through gynaecology and obstetrics clinics (Al-Zahrani, 2010). Many of these limitations result from engrained social and cultural issues, especially the publicly-provided social structures (i.e. health centres), which are heavily influenced by Saudi Arabia's state-supported interpretation of Islam (Hamdan, 2005). HIV/AIDS in Saudi Arabia is a highly stigmatised disease, often considered a punishment for religiously and morally intolerable conduct (Francesca, 2002). The taboo and stigma attached to AIDS has been suggested as an important additional hurdle, preventing people from accepting health services (Remien et al., 2009, Steward et al., 2013, Zelaya et al., 2012).

Sexual health data from certain regions are often difficult to obtain due to the reluctance of study participants to discuss information with researchers. Although this study focused on Saudi Arabia, it should be noted that there are barriers to HIV testing in other regions where HIV is prevalent. For example, in sub-Saharan Africa, 30–70 percent of the population was aware of its HIV status in 2009 but only 3.6–42 percent of men and women were tested, with the data variability due to broad differences between individual countries (UNAIDS, 2011).

Social and cultural factors represent the most significant barriers in these countries. Often there is a particularly low uptake by women, some of whom fear the reaction of their partner and their partner's attitude towards HIV testing (Maman et al., 2001). Continued education and state-led support for HIV testing is likely to have the greatest effect on changing these cultural attitudes and thus increase the uptake of HIV testing and counselling. However, identifying factors that influence the uptake of HIV testing in Saudi Arabia is the first crucial step in planning and establishing programmes to overcome them.

This present study has the potential to provide a useful basis for health service providers and governmental institutions. Beneficiaries of this research project will not only be currently undiagnosed patients infected by HIV, but also the general population of Saudi Arabia as, with an increase in general awareness, the infection risk will decrease.

2.8 Chapter summary

In this chapter, the history of HIV infection, with an overview of the clinical aspects of HIV/AIDS, including transmission between humans, treatments and prevention, has been discussed. The chapter also presented the epidemiological features of the HIV/AIDS epidemic worldwide, as well as in the MENA region and Saudi Arabia in particular. The chapter focused on Saudi Arabia by providing geographical and historical accounts concerning the country. Social and cultural aspects of Saudi Arabia were also discussed, especially those relating to sexuality, such as marriage and gender issues. The chapter finished by stating the research problem and noted that HIV testing barriers emerge as a worldwide problem, with various issues being reported from many different nations. It also highlighted the lack of information about HIV testing barriers in Saudi Arabia and the need to explore them within the Saudi context.

3 Literature Review

3.1 Introduction

In reviewing the literature, a combination of systematic and narrative review was used in order to explore the various aspects of HIV testing in terms of policies, practice and barriers. This chapter provides a comprehensive review of the available literature that is relevant to HIV/AIDS from three major perspectives. It begins by highlighting the concerns worldwide about HIV/AIDS and young people. Then, a systematic review explores the factors that influence the uptake of HIV testing.

3.2 Young adults and HIV/AIDS

This section begins by considering the predominant HIV/AIDS risk factors for young people. Then, it continues by examining the attitudes and knowledge of adolescents regarding HIV/AIDS by examining research that has been carried out across the world. Young people's sexual behaviour and the relationship between this and HIV/AIDS are then discussed. Finally, this section concludes with a discussion of the literature regarding young people's knowledge of HIV/AIDS.

The World Health Organisation (2010) reported that 119 countries were actively testing individuals for HIV/AIDS. WHO (2012) identified a training programme, especially for medical practitioners, aimed at reducing the incidence of HIV in young people aged between 10 and 24 years. The report acknowledges that young people require health interventions that are explicitly aimed at them to ensure that they receive information about HIV/AIDS which is relevant to their needs.

3.2.1 HIV risk factors for young adults

Although risk factors and young people's behaviours might pose a direct threat to their health status, being young is generally associated with good health (Gore et al., 2011). In fact, however, some diseases, such as HIV, might infect an individual during his/her

adolescence but the signs and symptoms may appear later in life. In addition, puberty is the time that individuals reach sexual maturity when additional and serious risk factors for sexually transmitted diseases emerge (Patton et al., 2009). HIV/AIDS is considered to be connected to patterns of risky behaviour and so it can be eliminated, or at least reduced, by individuals making appropriate behavioural changes to their lifestyles (Page et al., 2006). Besides risk factors, such as those related to sexual behaviours, certain cultural, social and physiological factors may also be considered indirect risk factors for contracting HIV infections.

In the past, HIV/AIDS has been predominantly associated with gay men and intravenous drug users. However, Burke et al. (1990) adduced that sexually active heterosexual individuals are equally at risk, so preventative measures for HIV/AIDS need to be targeted at both homosexual and heterosexual groups. Both anal and vaginal intercourse (when practised with many or infected partners) are identified as high risk behaviours, as is the sharing of needles (Dennin et al., 2014). However, Catchpole (2001) suggested that these risks could easily be reduced and possibly eliminated through simply practising safe sex with the use of condoms and through cleaning, or by not sharing needles. However, MacDonald et al. (1990) claimed that the behaviour of heterosexual adolescents was not improving because the risks were being ignored.

Rathus (2013) claimed that, in the United States, 75 percent of high school students participate in sexual activity before school leaving age and an alarming 3 million students every year contract a sexually transmitted infection as a result of failing to practise safe sex. Rathus (2013) went on to claim that one in four Americans under the age of twenty are contracting HIV, with the HIV infection being more prevalent among men, individuals in their late teens, and ethnic minority factions. Clauss-Ehlers (2010) claimed that annually, 25 percent of new cases of HIV are among individuals aged between thirteen and twenty one years of age. Van Dyk (2008) adduced that most adolescents are

indeed conscious of HIV/AIDS; however, Van Dyk (2008) went on to suggest that there is not enough information available for adolescents on how to avert infection and subsequently, avoid the spread of the contagion. Van Dyk (2008) went on to point out that there exists an overwhelming deficiency in both HIV counselling and in controlled voluntary testing for adolescents; these present major obstacles to the prevention and treatment of HIV/AIDS. Catchpole (2001) suggested that better education and prevention programmes need to be made available to adolescents in order to reduce the risk of them contracting STIs and HIV.

Social and cultural values could also be counted as indirect risk factors for HIV in certain settings (Zambrana et al., 2004). For example, in many socio-cultural settings, a young man can prove their masculinity by practising unsafe sex with multiple partners, so fuelling the HIV infection risk. It is also not uncommon that women in certain cultural settings are unable to negotiate condom use, whereas some men perceive that using a condom indicates that they are weak (Widman et al., 2006). In addition, the taboo related to HIV/AIDS and other sexual matters also leads to a lack of communication between parents and their children regarding sexually-related behaviours. The lack of parent-child communication concerning sexual matters is an early missed-opportunity for sex education, which might contribute to adolescents practising risky behaviours early.

It is even more worrying when one examines the statistics for Sub-Saharan Africa, especially for women. Kako (2008) argued that HIV and AIDS are intrinsically linked to violence against women. Not only do such women suffer from sexual violence, if they do contract HIV, the stigma and discrimination that are associated with the disease causes them to be outcasts from both their immediate families and their communities which often further aggravates violence against them. With little support, women are consequently unable to access suitable care and treatment. Unfortunately, nearly 60 percent of individuals in Sub-Saharan Africa who are infected with HIV and AIDS are women, and

65 percent of fifteen to twenty-four year old adolescent women are living with HIV in developing countries (Essex et al., 2007).

Kako (2008) claimed that in countries where there is gender inequality and high levels of violence towards women, this, in effect, is contributing to the incidence of HIV. ActionAidUK (2013) reported that 30 percent of women in developing countries stated that their first sexual experience was against their will and, owing to their inequality, women rarely have the chance to refuse sexual intercourse or report acts of sexual violence. Regrettably, these women also have no power to insist that their sexual partner uses a condom; thus, women become more susceptible to infection (Kako, 2008).

Low socio-economic status could also be pinpointed as a socio-cultural factor which can increase the risks of contracting HIV, especially for women. Prostitution or paid sex, which is a common risk factor for HIV, is often associated with poverty and economic insecurity which are, in turn, due to a low socio-economic status (Scorgie et al., 2012, MacPherson et al., 2012). In addition, sex workers may often ignore preventive measures, such as using a condom, in favour of extra money (MacPherson et al., 2012). Taladi (2006) claimed that women who did not receive financial support from their sexual partner were more likely to use a condom than those who were financially dependent on their partner. Thus, socio-economic status has an impact, either directly or indirectly, in influencing the risk of HIV/AIDS and so could also be considered as a risk factor. On the other hand, wealth or high socio-economic status also seems to be associated with HIV infection (Shelton et al., 2005). Shelton et al. (2005) found a strong positive relationship between HIV infection and household income in Tanzania. In addition, an analysis of national survey data from eight sub-Saharan African countries indicated that HIV prevalence was positively correlated with socio-economic status (Mishra et al., 2007). Parkhurst (2010) concluded that both low and high socio-economic status influences risky behaviours.

Lack of literacy or low levels of education in general also have an impact on an individual's risk of contracting HIV. Jukes (2008) established a relationship between education attainment and HIV infection. According to Jukes (2008), educated individuals are more likely to practise safer sex than uneducated ones. In addition, Jukes (2008) found that school attendance is also associated with a reduction in sexual risks, such as unprotected sexual intercourse among men and women. This relationship was also found by Hargreaves (2008) whose study compared students who attended with those out of school. Hargreaves (2008) found that students, whether male or female, reported lower numbers of sexual partners than those out of school.

Various studies have pointed out biological and physiological HIV risk factors, such as the fact females are much more susceptible to HIV infection than males. Chersich and Rees (2008) argued that the biological nature of the female genital organ allows them to be exposed to large amounts of body fluids (blood, semen), which may contain the virus. In addition, many studies assessing the HIV vulnerability of pregnant women found that pregnancy increases a woman's risk of contracting HIV (Morrison et al., 2007, Leroy et al., 1994, Mbizvo et al., 2001). Chersich and Rees (2008) concluded that the increased risk of HIV transmission for pregnant women is mostly due to physiological changes rather than behavioural ones. There is also some evidence that sexual intercourse during menstruation increases the chance of HIV transmission (Tanfer and Aral, 1996, Duriux-Smith et al., 1992). On the other hand, it is widely accepted that male circumcision reduces female to male HIV transmission (Gray et al., 2007, Auvert et al., 2005). Thus, men who are not circumcised are at a greater risk of contracting HIV.

3.2.2 Knowledge and attitudes related to HIV/AIDS among young adults

Since the onset of the HIV/AIDS pandemic, there have been many campaigns aimed at raising awareness of risks and risk reduction measures. However, it is interesting to

examine to what extent the message is getting through and being heard, and to consider individuals' attitudes and knowledge regarding HIV/AIDS worldwide.

An interesting study was carried out in Iran with a cohort of students from a university (Tavoosi et al., 2004). The study claimed that there were approximately 5,100 Iranians suffering with HIV/AIDS and that one in five individuals testing positively for HIV/AIDS was around twenty years of age. However, Smedley and Syme (2001) claimed that owing to the length of time that HIV is in incubation, older adolescents and young adults who tested positive were almost certainly infected whilst they were younger teenagers. As mentioned earlier, Page (2006) claimed that by changing adolescents' behaviours these risks could be greatly reduced or even eliminated. Tavoosi et al. (2004) examined how the lack of sex education, higher rates of marriage and the high incidence of drug addiction all contributed to Iranian adolescents being at a high risk of being infected with HIV. Unfortunately, Iranian schools and universities, similar to other states in the region, follow the belief that discussing or teaching about HIV/AIDS categorises sexual activity as 'acceptable'. Therefore, any form of education relating to HIV/AIDS or sex is forbidden in Iranian schools, colleges and universities (Edberg, 2010).

This lack of education was evident when the students were interviewed although most of the students stressed that they would like to learn more about HIV/AIDS. Television and other media were identified as being their main source of information pertaining to HIV/AIDS. However, only a few students were able to answer the questions correctly. The main misunderstandings related to how individuals actually contract HIV/AIDS, with high percentages of students wrongly believing that it could be transmitted by mosquito bites and by using public swimming pools and public toilets. Further evidence from other Islamic states also shows that misconceptions about transmission are not uncommon. For example, Kaur et al. (2014) examined the degree of knowledge of HIV/AIDS among employees working at a company manufacturing medical products in Malaysia and found

that HIV being transmittable by mosquito bites was incorrectly indicated by the participants. Abolfotouh et al. (2014) indicated that misconceptions about the modes of transmission of HIV were also common among nursing students in Riyadh city. Moreover, the study revealed that nursing students in Saudi Arabia hold an overall unfavourable attitude toward people living with HIV (Abolfotouh et al., 2014). Tavoosi et al's (2004) study, also indicated that almost half of the students believed that individuals suffering from HIV/AIDS should not attend 'normal' schools, indicating an intolerant attitude towards sufferers predominately through lack of knowledge and understanding (Boler et al., 2003).

A cross sectional study was conducted in India by McManus and Dhar (2008) with the aim of exploring the awareness, knowledge and ideas of adolescent schoolgirls in relation to sexually transmitted infections and HIV/AIDS. All of the participants were adolescent girls aged between 14 - 19 years and, whilst overall there was an acceptable understanding of the ways in which HIV/AIDS could be transmitted, the knowledge concerning other aspects of HIV/AIDS, and common knowledge surrounding sexually transmitted diseases and the practise of safe sex was extremely limited. Over one third of the girls who participated in the survey had no knowledge about the different types of STI or their symptoms. Approximately one third of students believed that HIV/AIDS could be cured. Another more recent study conducted in India showed that 47.5 percent of the sample drawn from the general population thought HIV was curable with medication (Meena et al., 2013). Similar to the responses offered by the students from Iran, the Indian girls also claimed that their main form of information regarding sex education was through friends, the media and the internet. However, most claimed they would be comfortable discussing issues surrounding HIV/AIDS with a trusted female doctor (McManus & Dhar, 2008).

Three decades after the onset of HIV/AIDS it is not only in the developing world where there remains ignorance. The National Aids Trust (2014) reported that in the U.K. 35

percent of people did not know that HIV/AIDS could be transmitted through sexual intercourse if they did not use a condom, and only about 65 percent of individuals were able to answer correctly the questions regarding how HIV/AIDS could be contracted. The NAT (2014) went on to note that the proportion of those holding misconceptions about HIV/AIDS had risen since the previous survey conducted in 2010. Unfortunately, this lack of knowledge leads to higher levels of stigma and more negative attitudes towards people living with HIV. In 2014, a NAT (2014) report indicated that almost 29 percent of individuals wanted their employer to inform them if they were working with a colleague who was HIV positive. Korhonen et al. (2012) conducted a study to assess the knowledge of and attitudes towards HIV/AIDS of university students in Finland. They found that most of the students' knowledge about HIV was reliable although some misconceptions still existed. Korhonen et al. (2012) went on to assert that the attitudes of older students and female students towards people living with HIV appeared much more positive than those of younger students and male students. The study also revealed that students' HIV/AIDS related knowledge positively correlated with their attitudes (Korhonen et al., 2012). Wang et al. (2013) found that misconceptions about how HIV is transmitted were significant among non-medical professionals in Japan although the overall HIV/AIDS knowledge level in this study was high. The study of Wang et al. (2013) indicated that the greater the misconceptions, the higher the stigma or prejudice towards HIV-positive individuals.

Although sub-Saharan Africa is the region most affected by the HIV/AIDS epidemic, misconceptions are still evident in this region. Mishra et al. (2009) conducted a study to analyse population-based surveys from 23 countries in sub-Saharan Africa and to evaluate certain indicators regarding HIV/AIDS knowledge, attitudes and behaviours. The results indicated that HIV related knowledge and its related misconceptions varied across these countries with an overall improvement being seen in recent surveys. Mishra

et al. (2009) went on to conclude that this lack of knowledge focussed mainly on certain preventive measures and manners of transmission, such as via mosquito bites. In addition, countries in West Africa were among those with the lowest level of HIV-related knowledge while Southern Africa seemed also to be affected by misconceptions concerning HIV. Ciampa et al. (2012) study focused solely on the HIV knowledge of women of childbearing age in Mozambique. The median age of the participants was 24. In particular, more than half held the following misconceptions: HIV cannot be passed from mother to baby; sharing feeding utensils can transmit HIV; a curse can cause someone to get HIV; and cleaning the genitals after sex can prevent a person from contracting HIV. The situation in Ghana was similar among undergraduate students as their HIV/AIDS related knowledge was patchy with a mean score of 7.7 out of 12 (Oppong and Oti-Boadi, 2013). Oppong and Oti-Boadi (2013) study highlighted gender disparities in terms of HIV knowledge as female students' knowledge was superior to that of their male counterparts.

Overall, the existing literature in this area shows a large number of similar misconceptions across populations, with little variation by age or gender. Misconceptions are generally influenced by education, with higher education levels increasing knowledge of HIV/AIDS. The literature also pointed out that the patterns of HIV/AIDS misconceptions were common across populations and nations, regardless of their epidemic status. However, there is some support to indicate that the level of stigma and discrimination attached to HIV/AIDS is associated with the level of HIV/AIDS misconceptions. Thus, ignorance about HIV was not confined to particular nations or certain groups within populations as evidence of HIV/AIDS misconceptions in Western Europe, the USA and Japan, considered to be highly developed and advanced countries, were not uncommon. On the other hand, regions where HIV is highly predominant, such as sub-Saharan Africa, still suffer from ignorance.

3.2.3 Young adults' risk taking behaviours and HIV/AIDS

It is important to examine the relationship between young people's behaviours and HIV/AIDS. Various studies have claimed that a person's stance and viewpoint, their perception of acceptable behaviour, and their consequent beliefs concerning sexual behaviour are all responsible for determining the sexual habits of adolescents (McManus & Dhar, 2008). Certain constructs, such as the timing of the first experience of sexual intercourse, the number of sexual partners, and cultural myths, influence young people's sexual related behaviours which may, in turn, affect their sexual health status (Bearinger et al., 2007). It is also apparent that sexual partners influence behaviours such as condom use. However, gender inequality in developing countries worsens females' ability to influence or negotiate safer options during sexual intercourse (Jewkes and Morrell, 2010, Marston and King, 2006).

Muchimba et al. (2013) studied the risk-taking behaviours of young Malawian adults up to the age of 29. The risk-taking behaviours that were evaluated, involved multiple sexual partners and lifetime sexual partners while other non-sexual, risky behaviours were identified. These included drug use, gambling, fighting, the consumption of alcohol at an early age, theft, and vandalism. The study found that a lack of behavioural control over non-sexual behaviours significantly increased the likelihood of risky behaviours that would increase an individual's chance of contracting and transmitting HIV.

Attitudes towards contraception vary considerably and are arguably culturally dependent; yet when considering the prevalence of HIV/AIDS, individuals' attitudes towards the use of condoms, for example, are vital in raising awareness and consequently reducing the incidence of HIV/AIDS in adolescents (Awad et al., 2004).

The use of drugs, alcohol or other intoxicating substances is linked to adolescents' sexual behaviour. Fisher et al. (2007) found that, in sub-Saharan Africa, alcohol use was associated with HIV infection. Mayer and Pizer (2009) endorsed the evidence that

adolescents are more likely to participate in risky activities, such as unprotected sexual intercourse, after consuming intoxicating substances; this consequently puts adolescents into a higher risk category for contracting HIV/AIDS. Mayer and Pizer (2009) suggested that intoxicated individuals are less likely to practise safe sex and are more likely to have sexual intercourse with more than one partner. In addition, Walsh et al. (2015) asserted that there is promising evidence regarding the effect of interventions which aimed to reduce alcohol intake or the number of sexual partners are promising. Walsh et al. (2015) went on to suggest that, if the use of intoxicating substances is related to an individual's involvement in risky behaviour, such as indulging in unprotected sex, the dynamics of these actions, whether causal or non-causal, needs to be understood and researched in more detail.

3.3 HIV testing

The process of HIV testing started soon after the virus (then called human T-cell leukaemia virus) was isolated at the Institute Pasteur in 1983 (Hottes et al., 2012). In the same year, *in vitro* studies began to cultivate the virus and begin human testing. However, at that time, there was little that could be done for those who tested positive as antiretroviral drugs were still undiscovered and so the main purpose of treatment was to reduce the spread of the infection. Following the breakthrough of an antiretroviral drug which changed and enhanced the response to the pandemic, HIV testing became the gateway to improve the quality of life for those infected with HIV. Today, according to World Health Organization data, approximately 600 million people in 122 countries were tested for HIV between 2010 and 2014 (WHO, 2015). International organisations (e.g. WHO and the UN) have encouraged a broad policy of HIV testing in all countries with a high incidence of HIV and for at-risk individuals. In addition, WHO recommends that HIV testing needs to be readily available and easily accessed by providing the test using a variety of delivery approaches. These approaches require that close attention is paid to

the epidemiology of HIV and the contextual issues of the setting. According to WHO guidelines on HIV testing services, recommended approaches to such services include facility- and community-based testing, and self-testing; each of these embrace a number of different schemes for HIV testing. For example, a facility-based approach includes voluntary counselling and testing services, as well as provider-initiated testing and counselling.

Although WHO/UNAIDS have encouraged efforts to scale up HIV testing, they have also highlighted the importance that any effort to increase the uptake of HIV testing should maintain the 5Cs. The 5Cs are consent, confidentiality, counselling, correct results and connection; these represent the key strands of policy associated with HIV testing according to WHO/UNAIDS. These five principles in particular ensure that the human rights of the individual are not compromised.

It must be ensured that an individual's personal information and HIV sero-status is handled with confidentiality, regardless of the setting or the type of HIV testing service. The availability of appropriate counselling is another strand which supports the human rights of an individual to receive advice which must be provided in a professional and competent manner. This allows the individual to make informed choices relating to whether he/she wants to be tested for HIV and ensures that individuals are able to opt out if routine testing is applied. In addition, the offering of testing should provide an assurance of the "accuracy" of the HIV testing result. It is also crucial to link the provision of testing with the provision of possible treatment and services. This, however, requires certain levels of organisation within local health systems so that the required treatment services are provided. In addition, there is a requirement for the healthcare organisation to resource such services adequately and to manage them professionally.

The following section explores HIV testing approaches and related services.

3.3.1 HIV testing approaches

A. Facility-based HIV testing

This refers to any HIV testing administered in a healthcare facility such as a hospital, clinic and/or laboratory. Voluntary counselling and testing (VCT) services, almost the first testing service established following the identification of the virus, are one of the approaches considered to be facility-based. VCT, as its name suggests, is client-initiated and is often offered as a stand-alone service.

Provider-initiated HIV testing and counselling (PITC) denotes that the HIV test is offered routinely in a healthcare facility with the option being available to decline the test which is accompanied with pre- and post-test counselling; it requires consent. This type of HIV testing has proved to be effective in a variety of settings and across different socio-cultural contexts. PITC is mainly applied in antenatal clinics, TB clinics and STDs clinics. However, it might also be introduced within other healthcare services such as primary healthcare centres. Routine HIV testing has also been implemented to increase the uptake of HIV testing, especially in highly endemic areas. For example, in Botswana, the routine offering of HIV testing has resulted in a considerable increase in HIV test utilisation. In addition, Weiser et al. (2006) considered the routine HIV test a solution to overcome social barriers such as stigma since the HIV test would be carried out within a regular health check.

Mandatory HIV testing involves obliging individuals to undergo HIV testing based on their background, origin, and/or for certain reasons such as pre-marital, employment or military recruitment purposes. WHO/UNAIDS do not support mandatory HIV testing for the general population, no matter what the reason; they only support mandatory HIV testing in a very limited number of situations. These conditions include screening for HIV and other blood-borne pathogens in all blood and blood products that are intended for

transfusion, as well as testing those who are donating any form of body fluids and/or organs.

B. Community-based HIV testing

The community-based HIV testing approach refers to HIV testing conducted outside of healthcare facilities. Several methods are considered as part of a community-based approach for HIV testing, such as door to door, home-based testing and mobile HIV testing. Suthar et al. (2013) asserted that community-based HIV testing services are effective in increasing the early detection of HIV infected individuals. In addition, Suthar et al. (2013) found that community-based HIV testing assists in reaching infrequent users of healthcare facilities such as men and adolescents. Wolff et al. (2005) also reported that the uptake of HIV testing services in a rural African context was found to increase markedly with the introduction of a home-based voluntary counselling and testing service. The study of Morin et al. (2006) revealed that same day mobile HIV testing was acceptable in Zimbabwe; however, HIV-related stigma appeared to be a barrier for this mode of testing delivery.

C. HIV self-testing

Self-testing for HIV means that anyone who would like to know his/her HIV status could use an HIV kit, perform the test and interpret the results. Although HIV self-testing does not offer a definitive result, it is an excellent opportunity to increase the uptake of HIV testing among those who have not been tested using other HIV testing approaches (MacPherson et al., 2014). In general, HIV self-testing appears to be an accepted approach to HIV testing for various population groups (Figueroa et al., 2015). In a setting where there are concerns about confidentiality, self-testing seems to be superior when individuals decide to undertake the test.

The following section presents a brief discussion about the debate surrounding HIV testing approaches and the human rights element of HIV testing.

3.3.2 The HIV testing debate

Bayer and Edington (2009) commented on policies regarding HIV testing and human rights and described the conflict between the human rights of the individual and the requirement to implement adequate public health controls. Bayer and Edington (2009), however, echoed the concern of Granich et al. (2009) concerning the relentless rise of HIV cases, which seems assured under current guidelines and protocols. Granich et al. (2009) proposed a model of disease control where all individuals are tested for HIV every year and where those with the infection are put immediately on antiretroviral therapy. This more radical approach of Granich et al. (2009) is described within the context of modelling outcomes which show an eventual process of disease elimination and falling expenditure for disease management. This radical proposal for disease management, however, would essentially be removing certain elements of an individual's human rights. The possibility is raised that specific governments might adopt a more aggressive form of population screening in which certain mandatory elements would generally be seen as a contravention of an individual's human rights.

Obermeyer and Osborn (2007) provided an historical perspective to the current debate on the testing modes for the HIV infection. They indicated the initial perspective that a mandatory testing scheme for HIV would drive the disease 'underground' on account of the high levels of social stigma associated with the infection at the time of the initial AIDS outbreak.

Obermeyer and Osborn (2007) also noted that, even when individuals are tested on a voluntary basis, there can be a reluctance to return for the test results (Creel and Rimal, 2011) although this may be less of an issue with more rapid testing techniques. This

has also been a common problem with HIV testing in the developing world (Seña et al., 2010). Meadows et al. (1993) described the gap between the intention to get tested and the actual level of compliance with voluntary testing.

Specific efforts have been directed towards reducing the stigma associated with a positive identification of the HIV infection as a factor in increasing the uptake of voluntary testing. Heijnders and Van Der Meij (2006) in particular identified that the most effective method lies in a patient-centred approach where likely patient interactions within the community are identified and constructively supported. Within testing programmes, the assurance of confidentiality is a key to achieving satisfactory rates of voluntary compliance. Fylkesnes and Siziya (2004) in particular identified an awareness of a lack of confidentiality in testing systems which resulted in a reduction in the uptake of testing.

While established health systems generally have high levels of professional conduct to ensure the confidentiality of HIV test findings in the developed world, Paxton et al. (2005) noted that, in some health systems such as those in Asia (India, Indonesia, Thailand and the Philippines) breaches of confidentiality take place routinely. This can result, in particular, in discrimination against women who can be subject to physical assault, ridicule and harassment. In addition, Paxton et al. (2005) argued that the increasing trend of screening pregnant women in Asian countries is tending to give rise to increasing social pressures for those identified as HIV positive.

The implementation of mandatory testing programmes within health systems where there are inadequate patient safeguards, such as those relating to confidentiality and high residual levels of stigma associated with HIV infection, is likely to result in increased patient distress and discrimination. Evidence exists, however, to show that, where levels of confidentiality with regard to HIV testing and counselling increase, then the uptake of voluntary testing also increases (Gahagan et al., 2010).

Across the developed and developing world a wide range of systems is used to deliver HIV testing services. For example, the models of centralised health facilities are often found not appropriate within the developing world. Thus, the testing protocols and strategies need to be tailored to meet local conditions and situations. Across all such systems, however, there is confirmation of the drive to improve the quality and effectiveness of specific systems and where in particular the level of confidentiality of services is a key element (Obermeyer and Osborn, 2007).

3.3.3 Importance of HIV testing

Only around 50 percent of HIV sufferers are aware of their HIV status (UNAIDS, 2012, p.6) due to factors which include a lack of testing facilities, the reticence of individuals towards testing, and the stigma associated with HIV (Christopoulos et al., 2012). This lack of knowledge regarding their HIV status has resulted in a pool of around 17 million HIV carriers, each of whom has the potential to spread the infection.

There are many benefits to HIV testing, the most important of which is an earlier diagnosis of HIV infection; this, in turn, leads to increased survival rates after treatment. Nakagawa et al. (2012) indicated that effective antiretroviral therapy (ART) can be understood to add significantly to the life expectancy of treated individuals. They provided the example of an MSM aged 30 with HIV diagnosed in 2010 and with a median CD4 cell count value of 432 cell/micro litres. At this level, the projected median age at death is estimated at 75, which is equivalent to a value of 7.0 years lost. For lower CD4 cell count values at diagnosis (140 cells per micro litre), which represents a later diagnosis, an average of 10.5 years of life is estimated to be lost. Smith et al. (2010) identified reduced life expectancies for older male adults who were late presenters compared with older adults who were diagnosed earlier. In addition, there is a tendency for older male adults to be late presenters. In a review of a range of cohort studies, Consortium (2009) indicated that a minimum CD4 cell count of 350 cells per

micro litre should be used as a marker for the commencement of antiretroviral therapy. This recommendation for treatment is based on the survival rates of affected individuals. There is a general trend, however, to offer immediate antiretroviral therapy as a means of both optimising an individual's survival and also reducing the likelihood of transmission to sexual partners. Kitahata et al. (2009) found that increased survival correlated with higher CD4+ immune cell levels, and was associated with early HIV infections. Early treatment among patients with a relatively low CD4+ concentration (351-to-500 cells) improved survival significantly, with 137 deaths reported as compared with 238 deaths for the group where treatment occurred later. An increased CD4+ cell count allows the immune system to fight opportunistic infections that become established in immune-compromised individuals. The results of Kitahata et al.'s (2009) study confirm the findings in earlier work by (Graham et al., 1992) which measured the expected survival rates for patients treated early on with the antiretroviral drug, Zidovudine, compared to men who were already HIV-1 positive at the point of treatment. Graham et al. (1992) found that early treatment with Zidovudine reduced mortality at 6, 12 and 18 months after treatment. Castilla et al. (2002) compared the incidence of late testers against all the remaining cases of HIV/AIDS by analysing surveillance data in Spain from 1994 to 2000. The analysis revealed that the number of individuals diagnosed with AIDS noticeably increased during this period; most of these were late testers. Castilla et al. (2002) noted the importance of early HIV testing since those individuals who were unaware of their HIV infection were more likely to develop AIDS earlier than those who knew their status. In the following part of this chapter, a systematic literature search was employed to explore the factors that influenced HIV testing worldwide and across a variety of populations.

3.4 HIV testing influences: systematic literature search

In this section of the literature review, a systematic literature search method was employed. Identifying all the existing literature focusing on HIV/AIDS testing influences during the past 18 years was necessary in order to identify the current knowledge on those factors that influence HIV testing behaviours. This systematic literature review was undertaken to explore the existing work concerning the factors shaping HIV testing behaviours among adults in any dedicated HIV testing facilities or services. This exercise was designed to identify gaps in the current knowledge and inform the development of appropriate research questions for this present study.

3.4.1 Review question

In order to conduct a robust review using a systematic methodology, review questions need to be formulated. Thus, for the purpose of this review, the following question was developed to guide the systematic literature search:

What are the factors that influence HIV testing behaviour among individuals aged 17 and over?

3.4.2 Review methodology

The following electronic databases (MEDLINE, PSYCHINFO, CINAHL and Web of Science) were searched from 1998 up until 2016. Then, the reference lists of the eligible studies were checked to identify any key studies that were missed during the electronic database search. In addition, Google Scholar was used to make sure that no eligible studies were neglected.

The following search terms were used and combined:

(HIV, AIDS, Human Immunodeficiency Virus, Acquired Immunodeficiency Syndrome) and (testing, testing practice, testing barriers, testing facilitators, testing motivators,

testing preferences, screening, screening barriers, early diagnoses, late diagnoses, late presenter, testing compliance, uptake).

3.4.3 Selection criteria

The existing research on HIV/AIDS testing barriers employed a range of designs. For the purpose of this review both quantitative and qualitative study designs have been included and therefore this review has identified all the relevant papers that have addressed this issue in the last 18 years.

A. Inclusion criteria

- Studies published in a peer-reviewed journal from 1998 to 2016.
- Published in English.
- HIV/AIDS testing barriers used as the main outcomes.
- The study population comprised people over 17 years old; however, studies about the barriers in antenatal clinics or during pregnancy were excluded.
- All relevant studies, regardless of the research method.

B. Exclusion criteria

- Studies published before 1998.
- Studies published in any language other than English and Arabic.
- Studies concerned with barriers among children, pregnant women or parents during antenatal clinic visits.
- Extended abstracts, conference proceedings, editorials and unpublished studies.

3.4.4 Identification of studies

The systematic literature search identified 3,384 potentially eligible studies in accordance with the inclusion and exclusion criteria. Web of Science, via the Web of Knowledge, retrieved 890 potential results while Medline, PsychInfo and CINAHL via EBSCO HOST retrieved 1086, 495 and 913 potentially eligible studies respectively. Various measures

were taken to assess the eligibility of the studies. Study titles and abstracts which were identified were checked thoroughly and 3,248 results were accordingly excluded. Full copies of the remaining 136 potential studies were assessed for their validity in terms of the review question and their consistency with the search strategy. At the full paper assessment stage, 63 studies were excluded for a variety of reasons and therefore 73 studies were included for further exploration and critique. The reasons for exclusion varied according to the stage at which the exclusion occurred. At the titles and abstracts stage, the reasons for exclusion included duplication, neither HIV testing barriers nor facilitators were one of the study's end points, or the identified paper, such as an editorial, was not a study. However, the reasons for exclusion at the full paper analysis stage were either because the study outcome did not include the factors that influenced HIV testing behaviours or because these factors were investigated among a population other than the population of interest. The exclusions at each stage are shown in the following flowchart (see Figure 4).

Flow chart

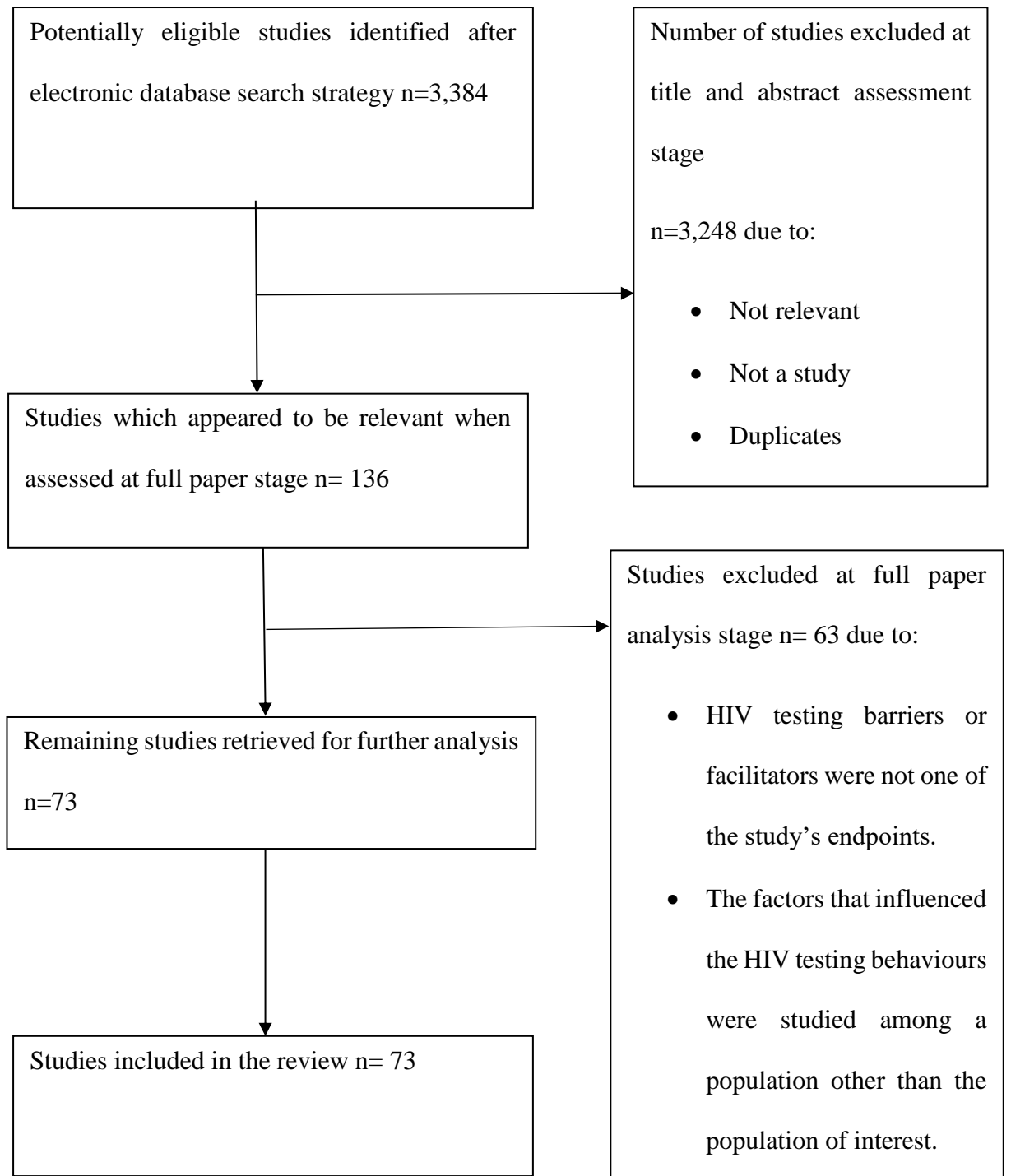


Figure 4: Flow chart of Systematic literature search

3.4.5 Study characteristics

Twenty-four studies from the total number included in the review were conducted in the USA and six in the UK while five studies were carried out in South Africa and four studies in the Netherlands. The literature search also identified five studies that were conducted in China. In addition, two studies were conducted in each of the following countries: India, Tanzania, Indonesia, Belgium and Uganda. Moreover, one study was conducted in each of the following countries: Spain, Cambodia, Peru, Mongolia, Burkina Faso, Sierra Leone, Guatemala, Brazil, Malaysia, Ethiopia, Cameroon, The Balkans, Sweden, Malawi, Hungary and Australia. However, three studies were conducted across multiple countries, two of them across European states with one of them carried out in Hungary, Switzerland and Italy (Bollini et al., 2002) and the other was conducted across Belgium, Estonia, Finland and Portugal (Deblonde et al., 2014). Finally, one study was conducted across 10 countries in the south east Asia region (Guadamuz et al., 2015).

In terms of the study design, Twenty-nine studies employed qualitative research methods using a variety of data collection techniques such as face-to-face interviews and group discussions. Quantitative research methods were used in 34 studies. In addition, analyses of policies and documents were carried out by three of the studies while only two studies employed a mixed method. The studies recruited a wide range of participants, including: migrants, injection drug users (IDUs), men who have sex with men (MSM), sex workers (SW), clients of SW, young people, HIV patients, TB patients, lay public, health professionals, students, key informants, and STD clinic attendees.

Although all the studies attempted to find out what factors influenced HIV testing behaviours, five modes of HIV testing were evaluated in relation to these factors. These five HIV testing modes were: voluntary counselling and testing (VCT), routine HIV testing, rapid HIV testing, home-based counselling and testing (HBCT), and HIV screening. Several studies failed to provide a clear definition of the HIV testing mode that

had been assessed to identify the factors. There was also wide variation amongst the studies in terms of recruitment procedures as well as sampling techniques. In addition, sample size varied dramatically between studies.

The studies considered here identified four different categories of the factors that influenced HIV testing behaviours, namely: individual level factors, cultural or social level factors, system or policy level factors, and health care providers' level factors. In the following section, the HIV testing barriers are articulated under these four categories. For more details about the included study characteristics.

3.4.6 Quality assessment

As previously mentioned, the purpose of this systematic literature search was to explore the factors that have an impact on HIV testing behaviours worldwide. This review was conducted to inform the research in terms of identifying gaps in the literature. A list of exclusion and inclusion criteria was established to guide the review. Studies were included for their contribution to the knowledge regardless of their quality. However, where a better quality study was available, the poor quality study was excluded, especially if both were conducted in specific settings or with particular populations in a particular country.

This systematic review exercise used multiple checklists or metric evaluation tools to assess the quality of each individual study, as included studies varied in their design. The inclusion criteria allowed for distinct studies in terms of population, setting and design to be included and therefore it was not practical to overstress the appraisal of the studies and exclude studies based solely on subjective quality assessment. Sandelowski (2015) argued that:

“The process of judging inevitably entails the active deployment of taste, or the selection of those considerations deemed applicable to any one object of evaluation in addition to

the continual (re)interpretation of those considerations and their applicability to any other comparable object of evaluation.” (p. 89)

Although Sandelowski’s (2015) argument is rational, assessing the quality of the studies included in the systematic literature review was a valuable exercise to ensure the findings of the review were sufficiently strong. Therefore, four checklists or quality assessment tools were used to assess the quality of the included studies according to their type and design. For quantitative cross sectional studies, a tool used by a number of researchers was used (Davids and Roman, 2014, Louw et al., 2007, Roman and Frantz, 2013, Saab et al., 2016, Wong et al., 2008). In terms of qualitative studies and systematic reviews, the checklist was developed using the Critical Appraisal Skills Programme (CASP) (2014) whereas mixed methods research was assessed using the MMAT tool proposed by Pluye et al. (2011).

The quality assessment tables are included in the appendix. For more information, please see Appendix C (1-4).

3.4.7 HIV testing factors

Although access to HIV testing has increased markedly, especially in highly endemic countries, there is still a low uptake of HIV testing globally (Binagwaho et al., 2012, Payne et al., 2006). As mentioned previously, four categories emerged from the literature. This section explores those four factor categories in detail. For more information about the included study.

A. Individual level factors

The category concerning individual level barriers was further sub-divided into risk perception, fears, knowledge, and access while those barriers that did not easily fall into any one of the main categories were included under the category ‘additional individual level barriers’.

- **Risk perception**

Twenty-five studies, eleven of which were conducted in the USA, reported a low perception of risk as one of the barriers to HIV testing. Twelve studies employed a cross-sectional survey method to pinpoint the barriers whereas eight studies used qualitative research methods. Although nine studies recruited men who have sex with men to identify the HIV testing barriers, the remaining studies recruited various types of participant, such as young people, migrants and ethnic groups, as well as key populations such as female sex workers and injecting drug users (IDUs). In the study conducted by Wei Ma and colleagues (2007), 86.5 percent of the respondents believed they did not perform any risky behaviours which required HIV testing. Ma et al. (2007) was a longitudinal study in which participants were provided with a coupon for a free HIV test; they were asked to return it after two months, even if they had not used it. Thus, this coupon distribution to the participants allowed the researcher to calculate the actual HIV testing rather than just the testing intention. Moreover, in the study conducted by Peralta and colleagues (2007), 54 percent of the respondents thought that they could not be HIV positive, either because they did not feel sick or they did not feel at risk of contracting HIV. In a study conducted in a large university medical centre which treated about 1300 HIV patients, the participants' perception of their vulnerability was divided into three themes: those who did not perceive their behaviour as risky; those who perceived their behaviour as very low risk; and those who felt their chances of contracting HIV were very low despite their risky behaviour (McCoy et al., 2009). In addition, five studies conducted with five distinct types of individual (HIV/AIDS patients, Hispanic, black MSM, migrants MSM, and non-institutionalised adults) revealed that the most common reason for not obtaining an HIV test was that participants did not consider themselves to be at risk (Mills et al., 2011, Lopez-Quintero et al., 2005, Mimiaga et al., 2009, Song et al., 2011, Deblonde et al., 2014). The actual gap between the HIV risky behaviours and the risk perception among

MSM and those whose behaviours put them at high risk of contracting HIV seems crucial in the process of making a decision to be tested for HIV (Lee et al., 2015, Wei et al., 2014, Woodford et al., 2015, Guadamuz et al., 2015). Hong et al. (2012) also found that female sex workers (FSW) were not better at weighing their risk of contracting HIV while Lahuerta et al. (2013) found that even the clients of the FSWs perceived their risk as low and therefore chose not to undertake an HIV test. Despite the obvious risk encountered by FSWs, low HIV risk perception among this group was indicated in the study of Hong et al. (2012); this might have resulted from the social desirability bias posed by the study's design. A systematic review carried out to identify the barriers to workplace HIV testing also revealed that low risk perception was among the most important factors hindering the utilisation of the test (Weihs and Meyer-Weitz, 2015).

It was also clear from a study conducted in a dental clinic to assess the acceptability of the oral HIV test that, although this HIV test was preferred among clinic attendees, low risk perception was the most common barrier (Dietz et al., 2008). Moreover, two studies conducted in the UK using a qualitative research design cited low risk perception as an important factor that lead to the test being avoided (Dowson et al., 2012, Burns et al., 2005). Similarly, in Australia, a group of researchers carried out an online survey to determine the HIV testing barriers among MSM (Prestage et al., 2012). The survey revealed that low risk perception was one barrier to HIV testing (Prestage et al., 2012). It was also evident that low perception of risk did not vary among ethnic groups since two studies conducted in the USA among African Americans and Asian Pacific islanders revealed that low risk perception was one of the major barriers to testing (Wong et al., 2012, Nunn et al., 2012). Spielberg, Kurth et al. (2001) found that low risk perception was common amongst three at-risk groups: MSM, IDUs and STD clinic attendees. In spite of the fact that the low levels of HIV risk perception were similar among other high

risk groups, FGDs and the face-to-face interviews used to collect the data in the study carried out by Spielberg et al. (2001) might induce social desirability bias.

Although the studies which reported low risk perception as a barrier were conducted in diverse settings, on distinct types of participant, and took place in various parts of the world using a range of research methods, further studies are needed to ensure that low perceived risk is also an HIV testing barrier in a country like Saudi Arabia.

- **Fears**

Various types of fear were reported as an HIV testing barrier in 48 studies. Most of the reported fears and worries were related to a positive HIV test result and its unwanted (social and psychological) consequences. However, worries about maintaining privacy and/or breaching confidentiality were also frequently cited. Fears of a positive HIV test result can be divided into social fears and psychological fears. Social fears include fear of discrimination, fear of stigma, fear of disclosure, and fear of divorce or separation from a partner, whereas psychological fears tended to focus on fear of dying from AIDS, fear of the test being inaccurate, fear of blood and fear of the needle. Eight studies that concerned men who had sex with men stated that fear of a positive result and its related consequences, whether psychological or social, was one of the major barriers to HIV testing (Song et al., 2011, Mikolajczak et al., 2006, Dowson et al., 2012, Flowers et al., 2003, Mimiaga et al., 2009, Stolte et al., 2007, Lee et al., 2015, St. Lawrence et al., 2015). It was also clear that fear of a positive result and stigma were cited by Malawian health workers when they were assessed concerning their HIV testing barriers (Namakhoma et al., 2010). A mixed method approach was applied in Namakhoma et al. (2010) study where the purpose of the qualitative semi-structured interviews carried out with health workers was to inform the development of the survey used in the quantitative arm of the study.

Young people and university students also pointed out the fear of a positive result and its unfavourable consequences as one of the main reasons for being reluctant to get tested for HIV (Addis et al., 2013, Strauss et al., 2015). Both studies were conducted in sub-Saharan African countries where HIV is at its most prevalent worldwide. They revealed similar findings although each used a different study design. A cross-sectional survey was employed in Addis et al. (2013) who used probability sampling to recruit university students whereas qualitative FGDs were used by Strauss et al. (2015) who recruited adolescents.

In Cameroon, it was noted that fear of knowing the result and disclosing it, as well as fear of stigma and discrimination, worried tuberculosis patients. Although Njizing et al. (2010) revealed important information about HIV testing among TB patients in Cameroon, the involvement of one of the leaders of the TB/HIV programme in the country might affect the reliability of the findings. In addition, TB patients in Indonesia claimed that fear of knowing their test result prevented them from undertaking an HIV test (Mahendradhata et al., 2008). Mahendradhata et al. (2008) used multiple qualitative methods, including interviews and FGDs; each method was used with different study participants. The interviews were conducted with TB patients whereas FGDs were used to gather information from nurses.

Likewise, people who were diagnosed with advanced HIV, those who were diagnosed concurrently with AIDS, and late HIV testers, as well as MSM, claimed that fear of knowing their HIV status delayed their intention to undertake the test (McCoy et al., 2009, Mills et al., 2011, Schwarcz et al., 2011, St. Lawrence et al., 2015). In addition, Deblonde et al. (2014) surveyed infected individuals who were recently diagnosed with HIV to assess the HIV testing practice in four European countries. The study revealed that fear of stigma, discrimination and breach of confidentiality were important factors that led them to postpone the HIV test. Although the study carried out by Deblonde et al. (2014),

which was conducted across four European countries (Belgium, Estonia, Finland and Portugal), the reliance on self-reporting, especially for those recently diagnosed with HIV, might induce certain biases, such as reporting error and recall bias.

Fear of stigma was mentioned in 11 studies conducted with various groups of individuals such as MSM, physicians, young people, TB patients, clients of FSW and migrants. It was also clear that worries about confidentiality violations were an issue, even in the developed world, since two studies which reported this worry were conducted in the USA and the UK (Payne et al., 2006, Prost et al., 2007). However, the findings of Payne et al. (2006) should be interpreted with caution as the small sample size of only 161 students and the participation incentives offered might have affected the quality of the study. Similarly, in Bosnia, Tanzania and South Africa, the fear of confidentiality being breached was also evident (Van Dyk and Van Dyk, 2003, Delva et al., 2008, Weihs and Meyer-Weitz, 2015, Ostermann et al., 2011)

Although anxiety about a positive result and its adverse consequences was the most common fear cited in the literature, a few studies pointed out other forms of fear related to a positive HIV test result. For example, in a study conducted in the USA which recruited three at-risk groups (MSM, IDUs and STD clinic attendees), fear of dying from AIDS and fear of social discrimination were reported (Spielberg et al., 2001). On the other hand, in sub-Saharan African countries, fear of divorce or separation from a partner, as well as fear of being rejected by family or an employer, was mentioned (Bwambale et al., 2008, Bhoobun et al., 2014). Bhoobun et al. (2014) also found that a fear that the ability to have children would be impaired if the test was positive contributed to an individual ignoring the risks and the test. Furthermore, fear of the service was also noted as African migrants in the UK-based study were worried about the standards in community-based testing centres (Prost et al., 2007). Additionally, fear of inaccuracy in the HIV test was cited by men in the study of HIV barriers existing in Uganda (Bwambale et al., 2008).

Individuals attending clinics for sexually transmitted diseases or genito-urinary clinics asserted that the fear of a positive HIV result was the most important fear which hampered them from taking an HIV test (Forsyth et al., 2008, Dukers-Muijers et al., 2009, Heijman et al., 2009, Kharsany et al., 2010). It was also evident that fear of a positive HIV result and its related consequences appeared to be a denominator for ethnic groups (Wong, 2013). Wong (2013) was conducted in Malaysia where a large multi-ethnic sample was recruited (n = 2271). The study used telephone assisted interviews to complete the survey which might induce social desirability bias.

Additionally, three studies which recruited three different ethnic groups (African migrants, Asian Pacific islanders and Hispanics) found fear of a positive HIV result and stigma as barriers to HIV testing. One study, conducted in the USA to assess African Americans' experiences of the rapid HIV test, revealed that fear of blood was one of the barriers to HIV testing (Nunn et al., 2012, Wong et al., 2012, Lopez-Quintero et al., 2005). Fear of needles was also indicated as reason for not being tested for HIV by MSM in the south East Asian region (Guadamuz et al., 2015). Guadamuz et al. (2015) gathered data via a web-based survey from the ten member countries (Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand and Vietnam) in the Association of Southeast Asian Nations (ASEAN).

- **Knowledge**

HIV, and AIDS in particular, are surrounded with uncertainty which needs to be clarified in order to tackle its spread. A lack of specific knowledge concerning HIV seems to interfere with the intention of individuals to seek testing. Five studies from those included in this review reported lack of knowledge about HIV as a barrier to HIV testing. In a study conducted in Cameroon to assess the facilitators and barriers to HIV testing in TB patients, it was clear that misconceptions about HIV/AIDS deterred testing (Njozing et al., 2010).

In addition, IDU women in Rhode Island (USA) and IDUs in Bali (Indonesia) stated that low levels of disease-specific knowledge and a lack of knowledge about AIDS seemed to play a role in hampering HIV testing (Lally et al., 2008, Ford et al., 2004). Moreover, patients diagnosed concurrently with AIDS claimed that, if they had a better specific knowledge of HIV, they could have been tested earlier (Mills et al., 2011). The participants' health status in Mills et al. (2011) might affect the reliability of the findings and could induce reporting bias.

Similarly, Burns et al. (2005) also found that lack of knowledge with regard to the benefit of testing led to low HIV test uptake among African migrants in the UK. The study of Burns et al. (2005) employed a self-completion strategy to fill in the questionnaire which might induce recall bias. In addition, the recruitment process, which only considered those recently diagnosed with HIV in London, would affect the generalisability of the findings. It was also found in Strauss et al. (2015) study that the inadequate knowledge of high school attendees contributed to the low level of their uptake of HIV testing. On the other hand, accurate knowledge about HIV/AIDS risk, testing and treatments appeared to be a facilitator with regard to the HIV testing behaviour among at risk populations (Woodford et al., 2015, Yasin et al., 2013). Furthermore, the unfavourable effect of the lack of HIV/AIDS related knowledge on HIV testing was not confined to the key population or lay public but extended to healthcare professionals (HCPs) (Samrith et al., 2015). Although the findings of Samrith et al. (2015) provide a valuable insight into HCPs referring TB patients to HIV testing, the findings were based on HCPs' perspectives rather than on actual experience.

- **Access**

Accessing the HIV test service appears to be an obstacle faced by individuals who choose to undertake the test. It was also clear that difficulties in accessing the HIV test were not

confined to developing countries. The systematic literature search revealed 14 studies that reported accessibility issues as barriers to HIV testing. For example, women in a study conducted in the USA who were IDUs mentioned the accessibility of testing as one of the barriers that prevented them from undertaking an HIV test (Lally et al., 2008). In addition, female sex workers and their clients claimed that the reason for not being tested for HIV was unawareness of the location of HIV testing centres, especially those providing anonymous services (Hong et al., 2012, Lahuerta et al., 2013). Accessibility was also an issue for young people in the Balkans, as well as MSM in Peru, since they were unaware of where they could get tested (Delva et al., 2008, Lee et al., 2015). It is important to note that, although Delva et al. (2008) was conducted across countries within the Balkans, the sample size was relatively small (n = 651); also, the participants were recruited only from urban schools. On the other hand, the retrospective nature of the study of Lee et al. (2015) might affect the quality of its findings.

Monica Christianson and her colleagues (2010) conducted a study among young individuals in Sweden in which they divided the barriers linked to accessing a clinic into two groups: administrative barriers, such as difficulties in getting appointments; and communicative barriers, such as a lack of encouragement (Christianson et al., 2010). Lack of information about HIV testing sites and the availability of HIV testing services was also considered a barrier to HIV testing in the USA and Malaysia (Payne et al., 2006, Wong, 2013). Moreover, MSM in South East Asia indicated that their lack of knowledge about where to get an HIV test contributed to their low uptake level (Guadamuz et al., 2015). In Tanzania and Burkina Faso, distance from the testing sites and not knowing where to get tested were cited as barriers (Ostermann et al., 2011, De Allegri et al., 2015). Mahendradhata et al. (2008) found that TB patients in Indonesia faced the burden of accessing voluntary counselling and testing (VCT).

- **Additional individual level factors**

The studies included in this review identified various issues considered as factors that had an impact on HIV testing behaviours at an individual level. Some of these factors could be considered as health provider or system-based factors. Concerns about test results were frequently cited across studies. For instance, long waits for test results were reported in three studies which were conducted in the UK on Scottish MSMs, in Indonesia on IDUs, and in the USA on three at-risk groups (MSM, IDUs and STD clinic attendees) (Flowers et al., 2013, Ford et al., 2004, Spielberg et al., 2001). In addition, Australian MSMs considered the need to return for the test result as a barrier (Prestage et al., 2012). It was also noted in a study which was conducted in Sweden to assess the HIV testing experience of young women and men, that unclear information about test results could affect their intention to re-test in the future (Christianson et al., 2010). It should be noted that Christianson et al. (2010) used focus group interviews to collect the data. This might affect the participants' responses as anonymity could not be maintained.

Prioritising obtaining drugs over their health status appeared to be a barrier for female IDUs in the USA (Lally et al., 2008) while substance abuse was identified as a barrier to testing in a USA-based study conducted by McCoy and her colleagues in 2009 on advanced HIV patients. It was also noted that transwomen in Brazil reported that illicit drug use during sexual intercourse contributed to their reluctance to undertake the test (Pinheiro Júnior et al., 2015).

Late HIV testers in the USA highlighted a lack of awareness about improved HIV treatments, a lack of free or low cost care, and the risks of HIV as factors to their HIV testing behaviours (Schwarcz et al., 2011). The work of Schwarcz et al. (2011) was a qualitative study which recruited 41 participants. However, because five interviewers conducted the interviews, this could affect the quality of the study findings. In addition,

African Americans in general raised certain issues that prevented them from undergoing an HIV test (Mimiaga et al., 2009, St. Lawrence et al., 2015). These issues included a lack of motivation, time constraints and the belief that the partner was clean (Mimiaga et al., 2009) while St. Lawrence et al. (2015) indicated that African Americans' lack of trust in medical systems also contributed to the problems. Moreover, sub-Saharan African migrants in Belgium claimed that a lack of information about HIV and preventive health behaviours, as well as limited financial resources, played an important role in their reluctance to undertake the test (Manirankunda et al., 2009).

Two studies concerning young people in Sweden and the USA reported specific barriers related to this age group. For instance, young people in Sweden experienced time-consuming traditional counselling which made them unwilling to repeat the test whereas the unwillingness of young people in the USA was due to a lack of appropriate adolescent services and mistrust of the services' quality (Christianson et al., 2010, MacPhail et al., 2008). On the other hand, young people in Sierra Leone admitted that being advised by doctors, family members or religious organisations to get tested for HIV facilitated their utilisation of the HIV test (Bhoobun et al., 2014). Bhoobun et al. (2014) also indicated that young people's decision to get the HIV test was positively associated with their knowledge of the availability of treatments if they tested positive. Although a random sample was obtained, the results cannot be generalised across Sierra Leone as they reflect only those aged between 18 and 35 years living in an urban area.

Lack of confidentiality or concerns about maintaining the privacy of the service users were also indicated in various studies worldwide. For example, in Brazil, transwomen believed that HIV testing services lacked proper confidentiality protection which made them choose not to be tested for HIV. Likewise, in China, MSM cited a lack of confidentiality of the testing service as one of the main reasons that hindered them in seeking an HIV test (Wei et al., 2014, Bien et al., 2015). Some HIV testing settings

seemed to be unacceptable as the confidentiality elements of the HIV test could be easily breached. For example, in assessing the acceptability of HIV testing in an emergency department, those who refused to be tested pointed out the lack of confidentiality as the basis for their decision (Christopoulos et al., 2012).

In the developing world there were some differences in the barriers encountered by individuals. The barriers in these countries related to socio-economic status, gender inequality and poor health policies. In Cameroon, TB patients claimed that harmful gender norms and practices were responsible for the low uptake of the test (Njosing et al., 2010). Inability to leave their work and partners' disagreement were cited by Tanzanians who used mobile voluntary counselling and testing services (MVCT) in the Kilimanjaro region (Ostermann et al., 2011). However, north Tanzanians, who received a home-based couple counselling and testing (HBCCT) service, stated that lack of privacy was a barrier (Njau et al., 2012). In addition, Francis Bwambale and her colleagues in 2008 claimed that men in rural western Uganda believed that lack of confidentiality was one of the factors associated with the poor demand for the VCT. It was also noted by Bhoobun et al. (2014) that young people in Sierra Leone cited lack of privacy and concerns about confidentiality as reasons for not considering an HIV test.

On the other hand, individuals in fishing communities in Uganda stated that a lack of time, as well as the cost of VCT, were barriers to testing in this community (Mugisha et al., 2010). In a study conducted in South Africa, lack of trust in the health system and a lack of support after diagnosis were mentioned as barriers affecting VCT clients (Van Dyk and Van Dyk, 2003). Additionally, women attending STD clinics in South Africa claimed that the need to consult a partner in order to undertake an HIV test was one of the reasons for the test's low uptake (Kharsany et al., 2010). Finally, in Indonesia, IDUs considered the lack of care as an additional barrier to the HIV test (Ford et al., 2004).

In summary, most of the studies cited low risk perception as the major barrier that contributed to the low uptake of the HIV test. As the word "risk" in this situation means the possibility of being infected with the virus, people tend to perceive their risk of contracting HIV as low; therefore, the testing decision is not taken. Fear of being HIV positive, together with its related unwanted consequences, appeared to be the second most common individual barrier that was identified in the studies reviewed here. Other forms of fear were also pointed out, such as fear of stigmatisation, fear of social discrimination, fear of dying from AIDS, and fear of a partner's reaction. In addition, accessibility to the test also seemed to be a challenge experienced by some individuals. Various issues were raised regarding accessibility. For instance, in a study conducted by Moyer and his colleagues in 2008, IDUs claimed that the number of HIV care centres was insufficient whereas participants in another study conducted by Ostermann and his colleagues in 2011 reported distance to the nearest testing site, as well as not knowing where to get tested, as major barriers. Moreover, a lack of knowledge about the disease, in terms of testing options, the availability of treatment, preventive measures, and modes of transmission, has played an important role in individuals' uncertainty with regard to being tested. For example, in one study, the participants believed they were uninfected with the virus because they had no symptoms and so felt they had no need to take an HIV test. Time constraints have also been reported as a barrier to HIV testing. Looking at the included studies, it is obvious that concerns about violations of confidentiality have a significant impact on an individual's testing decision. In spite of the fact that health policies and ethics, which are keen to preserve patients' rights to privacy and confidentiality, are well established in the developed countries, it is noticeable in some studies conducted in the developing parts of the world that people are still worried about maintaining their privacy and confidentiality.

B. *Socio-cultural level factors*

Social barriers to HIV testing can be defined as societal norms and practices that hinder HIV testing in society. Most of these factors have emerged as a result of how society deals with HIV/AIDS patients; however, some of the factors are related to gender inequality.

The stigma and discrimination attached to HIV/AIDS has been suggested as an important barrier in preventing people from accepting health services including HIV testing. HIV/AIDS-related stigma and discrimination seemed to be one of the most important issues that have thwarted efforts in the fight against the disease worldwide. This has also appeared to affect areas where the disease is highly endemic, such as sub-Saharan African countries, in terms of controlling the spread and treating those infected. Fear of stigma and discrimination has been reported in many studies in various parts of the world. Twenty-two studies, for instance, included stigma and discrimination as challenges faced by individuals even though these studies recruited diverse groups of individuals, such as MSM, IDUs and young people. It is obvious that concerns about stigma and discrimination are not confined to individuals in developing countries; this is also a problem that disrupts the efforts to tackle the disease in developed countries.

Njosing et al. (2010) found that TB patients in Cameroon blamed the likelihood of the stigma and discrimination related to HIV/AIDS as one of the reasons that made them hesitate to be tested. It was also clear that Tanzanians feared the consequences of being stigmatised, which included physical abuse, blame and divorce, to the extent that they chose not to be tested (Njau et al., 2012). In addition, IDUs in Indonesia and men in rural Uganda indicated stigma as an important factor that contributed to the low uptake of the HIV test (Ford et al., 2004, Bwambale et al., 2008). Being stigmatised was also cited in three UK-based studies (Dowson et al., 2012, Burns et al., 2005, Prost et al., 2007). Two of these were concerned with the difficulties faced by African migrants in obtaining HIV

tests whereas one explored these difficulties among MSMs. Deblonde et al. (2014) attempted to assess the HIV testing practices in four European countries (namely, Belgium, Estonia, Finland and Portugal) through those recently diagnosed as HIV infected. Stigma and discrimination attached to HIV/AIDS was indicated as one of the main reasons for being reluctant to get tested until that time.

In China, distinct groups of individuals agreed that the fear of stigma and discrimination was a hindrance to HIV testing (Ma et al., 2007, Song et al., 2011, Wei et al., 2014). It was also noted through the systematic literature search that the USA had the largest number of studies that referred to stigma and discrimination as a barrier to HIV testing; five studies did so. In spite of the fact that all five studies were assessing the barriers to HIV testing in the USA, diversity was evident among these studies. For example, testing barriers were explored among Hispanics, Africans, women IDUs, young people and three at-risk groups (MSMs, IDUs and STD clinic attendees), as well as the various methods that had been used. Apart from these differences, fear of stigma and social discrimination was cited as one of the major barriers to HIV testing in all five studies (Spielberg et al., 2001, Lally et al., 2008, Lopez-Quintero et al., 2005, MacPhail et al., 2008, Nunn et al., 2012). Stigma and discrimination were also reported in studies based in South Africa where HIV endemics have reached a very high level compared with other states in the region (Strauss et al., 2015, Weihs and Meyer-Weitz, 2015). In addition, Guadamuz et al. (2015) conducted a study across 10 South East Asian nations to assess reasons that made MSM choose not to test for HIV. The study revealed that stigma and discrimination were associated with never being tested for HIV (Guadamuz et al., 2015).

In the study conducted in Cameroon among TB patients, gender norms and practices were identified as a social barrier to HIV testing (Njozing et al., 2010). In addition, Wright et al. (2013) found that the reason behind the low uptake of HIV testing among African Americans was social norms and mores. Woodford et al. (2015) found that criminalising

HIV risky behaviours and a lack of supportive social norms acted as barriers for at-risk populations in terms of seeking HIV testing services. Likewise, in Guatemala, clients of FSWs who were considered to be at high risk of contracting HIV, reported HIV related stigma and discrimination as a hurdle to undertaking the HIV test.

Men's sense of superiority was also recognised by men in rural Uganda as a socio-cultural barrier to seeking VCT (Bwambale et al., 2008). South African women attending STD clinics reported an additional barrier: the need to consult a partner before taking the decision to undergo an HIV test (Kharsany et al., 2010). It was also noted that partner disagreement constituted an obstacle for Tanzanians who intended to take an HIV test (Ostermann et al., 2011). The sample in Ostermann et al. (2011) was recruited via the mobile voluntary counselling and testing campaign within the Kilimanjaro region in Tanzania and the sample size was quite large (n = 1384). However, the study's findings might not reflect other regions of Tanzania across the country.

In summary, socio-cultural factors were reported in 26 studies conducted all over the world. Stigma and social discrimination appeared to be the most common social barriers to HIV testing although gender issues were also highlighted in some developing countries as factors influencing HIV care and, in particular, HIV testing at a socio-cultural level.

C. Healthcare provider level factors

In the literature, HIV testing barriers at a healthcare providers' level included all the obstacles hindering HIV testing that were caused or faced by healthcare providers. The healthcare providers' level factors were not limited to testing but also to counselling. Twelve studies cited factors related to healthcare providers' practices regarding HIV testing.

Seven studies conducted in various parts of the USA reported healthcare provider barriers to HIV testing in different settings and among different providers. Myers et al. (2011)

conducted qualitative interviews with a group of key informants in San Francisco. Myers et al. (2011) found that healthcare providers have been blamed for the low uptake of HIV tests since their attitudes could have a de-motivational effect. In addition, the key informants raised the issue of competing clinical priorities as a barrier since spending time on prevention activities was seen as less important. In an effort to understand the findings of Myers et al. (2011), it is critical to consider that key informants' views might not reflect actual practice.

Johnson et al. (2011) found that time constraints were one of the barriers to HIV testing at the level of health providers since Massachusetts community health personnel did not offer an HIV test because of such constraints. It is worth noting that the study recruited 30 community health centre leaders out of 52 in Massachusetts; however, their views might be influenced by their role in the centres. Moreover, the healthcare personnel showed a poor level of awareness of CDC recommendations and they perceived that the Massachusetts' HIV testing policy was incompatible with these recommendations (Johnson et al., 2011). Arbelaez et al. (2012) conducted a survey with hospital emergency department providers to examine their willingness to offer HIV tests. The results showed that inadequate resources, time constraints and concerns regarding follow-up appeared to be barriers experienced by emergency department personnel. Korthuis et al. (2011) found that challenging priorities, lack of time, the perception of patients' reluctance, and the need for separate informed consent played important roles in hindering the take-up of the HIV testing offered by general internists. Simmons et al. (2011) found that time and financial limitations were major barriers while HIV training and education seemed to be additional barriers faced by the health providers. Peralta et al. (2007) argued that the failure to offer an HIV test was an obstacle faced by young people in the state of Maryland that led to HIV testing being ignored. Moreover, Sison et al. (2013) found that unawareness of the informed consent laws, as well as financial disincentives to offer HIV

testing, contributed to the unfavourable attitude toward offering HIV tests for both primary healthcare providers and infectious disease specialists.

In the UK, registrars employed in Sheffield believed that policy discouraged HIV testing and they were concerned that HIV testing might harm the relationship between doctors and patients (Partridge et al., 2009). In addition, uncertainties about counselling and managing positive results, as well as the unavailability of counselling locations, were added to the HIV testing challenges (Partridge et al., 2009). In Belgium, a study was conducted to assess physicians' barriers to implementing HIV testing for sub-Saharan African migrants (SAMs) (Manirankunda et al., 2012). The study revealed that a lack of information about the HIV epidemic in SAMs, the necessary communication skills to discuss sexuality, time, and HIV testing policies were major barriers that hindered the implementation of the testing programme (Manirankunda et al., 2012). The physicians also felt that testing individuals who were illegal immigrants was unethical (Manirankunda et al., 2012). Fear of stigmatising infected individuals and lack of communications skills were also cited by the HCPs as obstacles to undertaking the HIV test (Manirankunda et al., 2012, Samrith et al., 2015). In Indonesia, the barriers to HIV testing perceived by healthcare providers were similar to those acknowledged previously (Mahendradhata et al., 2008). These included difficulties communicating on HIV issues and lack of time, as well as inadequate facilities (Mahendradhata et al., 2008). Moreover, the need for training, as well as the required pre and post-test counselling element, made GPs in Spain ignore the need to promote the HIV test (Agusti et al., 2013). It is worth noting that, although the sample size in the study carried out by Agusti et al. (2013) quite large (n = 1308), the non-probability nature of the sampling technique would affect the generalisability of the findings.

To sum up, the majority of the studies which reported on the HIV testing barriers of health providers were carried out in the USA, although studies investigating these barriers have

also been conducted in the UK, Belgium and Indonesia. Time constraints were the most common barrier cited by the health providers across the studies. Despite the fact that the attitude of providers could motivate individuals to obtain an HIV test, it was noted that providers' attitudes could also play a role in an individual's reluctance to seek the test. It was obvious that financial issues, such as inadequate facilities and resources, played an important role in hampering the implementation of HIV testing on the part of providers. Two studies conducted in the USA asserted that competing clinical priorities was a barrier faced by providers which made them fail to offer an HIV test. Health care providers also showed a lack of confidence and the necessary skills to communicate about sexual and HIV-related issues. The poor awareness of HIV testing policies among healthcare providers had a serious impact on the application of HIV testing. Ethical considerations were also barrier for a certain group of the population in Belgium. Fear of stigmatising patients and harming the doctor/patient relationship was an obvious issue for physicians which affected their HIV testing practices. The importance of HIV-specific training was acknowledged by healthcare providers in the USA.

D. System or policy level factors

The factors that influenced HIV testing at a policy or system level were described as logistical and it was policy elements that led to the poor implementation of HIV testing. Nine studies reported issues that hampered HIV testing at a policy or system level.

In assessing HIV testing practices within a Hungarian addiction treatment setting, a group of key informants were surveyed (n = 8) and they claimed that a lack of resources, staff training and guidelines were the most important system level factors hindering the uptake of the testing (Gyarmathy et al., 2004). Another study conducted in three European countries (Hungary, Switzerland and Italy) reviewed the HIV testing policy in prisons (Bollini et al., 2002). In this study the key informants argued that a lack of knowledge about HIV preventive guidelines was obvious among prison authorities (Bollini et al.,

2002). In South Africa, insufficient counsellors and privacy, as well as long queues, were barriers to HIV testing at a system level (Van Dyk and Van Dyk, 2003). In India, focus group discussions were held between MSMs, female sex workers and transgender individuals to identify HIV testing barriers (Beattie et al., 2012). These discussions revealed that those belonging to such groups had already experienced discriminatory behaviour in government healthcare services and so were unwilling to use the HIV care service for that reason. In addition, the need to offer bribes to receive care was also shown to be a defect in the system that might affect HIV testing. Moreover, it was noted that the unavailability of treatments and poor healthcare facilities were additional barriers to HIV testing at a system level (Beattie et al., 2012). Another more recent study conducted in India revealed that mistreatment by staff at testing facilities, as well as the lack of rapid and non-invasive HIV tests, were important factors at a system level that affected the uptake level of the HIV test (Woodford et al., 2015). Woodford et al. (2015) also found that integrating HIV testing within illicit drug dependency rehabilitation centres and expanding outreach testing, as well as other supportive services, would help in increasing the uptake of the HIV test among at-risk populations.

In a study conducted among three at-risk groups (MSMs, IDUs and STD clinic attendees), it was obvious that concerns about named reporting and connections to care after diagnosis were major system barriers to HIV testing (Spielberg et al., 2001). Inadequate resources and financial constraints were also cited in three studies carried out in the USA as obstacles to HIV testing (Arbelaez et al., 2012, Moyer et al., 2008, Simmons et al., 2011). In addition, Laura Moyer and her colleagues also cited the lack of testing standards as an additional system level barrier to testing (Moyer et al., 2008). Similarly, in Indonesia, a lack of adequate facilities, which hindered the implementation of HIV testing for TB patients, was reported by healthcare providers (Mahendradhata et al., 2008).

3.5 Conclusion and research gap

HIV/AIDS is a major worldwide health problem, with approximately 42 million living with the virus (Deblonde et al., 2010). Central to this problem is the level of testing for the Human Immune-deficiency Virus (HIV). This has increased in its coverage worldwide, particularly in countries with high levels of infection but, as mentioned previously, there still appears to be significant barriers to participation. This is a significant issue as testing can prove important; not only can it help prevent further transmission of the virus, it can also help effective treatment to be provided to the sufferer. The review of the literature indicates that establishing what these barriers are and exploring effective ways in which they can be overcome are of paramount importance in attempts both to treat HIV/AIDS and prevent its transmission.

Although globally the number of new infections is declining, significant geographic variations in prevalence and epidemiological patterns are evident. Recent data show that the numbers of AIDS-related deaths, as well as new HIV-infections, increased between 2001 and 2008 in countries in the Middle East and North Africa (MENA) (UNAIDS & WHO, 2009, Abu-Raddad et al., 2010). Further data on HIV/AIDS in these countries are limited, especially those relating to HIV testing practices, as religious and cultural considerations often prevent national authorities from implementing effective systematic surveillance systems and conducting large-scale behavioural research (Shawky et al., 2009).

However, even if access to HIV testing services is possible in principle, opportunities to diagnose patients are often missed, due to genuine barriers at various levels. In spite of the fact that the literature review identified a large number of studies that explored the factors that influenced HIV testing behaviours worldwide, variations across nations and populations were noticed. For example, a low general awareness of risk and a lack of

information were found to be major factors in Europe, whereas gender inequality issues and societal norms appeared to be more prominent in developing countries.

The cultural and religious nature of Saudi Arabia and the substantial diversity in the HIV/AIDS epidemic there requires further assessment, especially in terms of accessing HIV related services and HIV related behaviours. In addition, young people (aged 15-24 years) account for almost half of newly diagnosed HIV infections (UNAIDS, 2012) and so it is particularly important that this demographic group continues to be tested and receives treatment. Data from the United Nations are encouraging regarding the decrease in the number of new infections in young people. However, UNAIDS and WHO have already highlighted the necessity “to tailor prevention strategies to local needs but also the importance of decentralizing AIDS responses” (UNAIDS/WHO, 2009). Since there is limited information about the factors that influence HIV testing behaviours in Saudi Arabia, the present study aims to provide this information.

3.6 Purpose statement

The purpose of this mixed methods study is to explore the HIV testing barriers that impede the utilisation of the testing services by young people in Saudi Arabia so an explanatory sequential type of mixed methods design was applied here to discover these barriers. In this type of mixed method design, quantitative data are collected first and this is then followed by the collection of qualitative data. Each strand of the collected data are then analysed separately. The final conclusion determines whether or not the qualitative results have explained the quantitative results. In the quantitative part of this work, a descriptive cross-sectional study was conducted to identify the factors that influenced HIV testing among university students; it also examined differences across the genders. The qualitative part of the study was conducted using interviews with health care professionals who specialised in HIV/AIDS in order to explore the barriers to HIV testing that affected young people in Saudi Arabia. A mixed methods design was chosen mainly

to understand the problem in depth and to explore the problem from multiple perspectives: i.e. from the perspectives of young people and healthcare professionals.

3.7 Chapter Summary

In this chapter, a review of the existing literature on the issues related to young adults and HIV/AIDS has been discussed, as well as HIV testing and the factors that influence HIV testing behaviours. This was accomplished through both a narrative and a systematic literature review. The narrative review section of this chapter played an important role in focusing the scope of the systematic literature review. On the other hand, the systematic literature review focused on identifying the factors that influenced the uptake of HIV testing among adults worldwide.

The HIV testing uptake appeared to be influenced by variety of factors at different levels but those which related to an individual's attitude, knowledge and perception about HIV/AIDS seemed the most prominent. The low level of HIV risk perception was the most frequently cited factor that prevented individuals from undertaking the test. At an individual level, the fear of a positive result was identified as the second most frequently reported barrier that contributed to the low uptake of the HIV test.

The social stigma attached to HIV/AIDS worldwide was shown in the literature to be the most important factor at a socio-cultural level. Stigma and discrimination seemed to be universal factors which affected both developing and developed countries. Issues related to gender inequality and cultural norms also need close attention, particularly in the developing nations and those mostly seriously affected by the epidemic.

Healthcare providers also faced challenges that might contribute to the low uptake of HIV testing. The literature particularly pointed out time constraints as a major issue faced by healthcare providers that might hinder the effort to scale up HIV testing. Other factors caused by the healthcare providers that were identified in the literature as possibly

affecting the uptake of testing included healthcare providers' attitudes. Prioritising medical interventions over preventive ones might also reduce the utilisation of HIV testing.

Logistical issues, such as inadequate resources, lack of trained staff and financial constraints, were important system- or policy-level factors which influenced the uptake of HIV testing. In various settings, individuals are directly affected by factors such as the unavailability of a rapid HIV test, the long queues at testing centres, and the cost of an HIV test.

The complexity of the low uptake of HIV testing, and at the same time its importance in the fight against HIV/AIDS, were clearly highlighted in the literature worldwide. Highly equipped and resource-rich settings, as well as poor resource settings, appeared to be struggling in scaling up HIV testing. In the literature review process, it was also noted that, despite a range of similarities across nations, settings and populations, a variety of approaches have been adopted to study this problem. Thus, various quantitative approaches, as well as qualitative ones, have been used to identify and explore the factors that influence the uptake of HIV testing. In addition, a number of studies have employed a mixed method approach to achieve their goals. The differences in how researchers have approached this problem also underscore its complexity and demonstrate the multifaceted nature of the problem under study. Moreover, the distinct features that distinguish nations and populations make it important to choose an approach that is favourable to those features in order to fulfil the aims of the study. Therefore, the current study has considered these issues in choosing an approach that would best fulfil its aim.

The following chapter presents the methodological and practical procedures as well as ethical considerations. The research objectives and research questions are also presented in the chapter which follows.

4 Methodology chapter

4.1 Introduction

The purpose of this chapter is to describe the methodological procedure, including the research instruments, sampling and recruitment techniques. The design and method of the research study are discussed in the light of the methodology literature.

4.2 Aim of the study

The aim of this research is to explore the factors that influence the uptake of HIV testing among young people aged between 17-25 years in Saudi Arabia. The four key objectives with its associated research questions are:

1. An exploration of the factors that influence HIV testing among young people in Saudi Arabia.

Research questions: What are the factors that affect young people's intention to undertake an HIV test?

- How do young people in Saudi Arabia perceive their HIV risks?
 - What is the level of HIV/AIDS related knowledge among young people in Saudi Arabia?
 - What attitudes exist toward HIV testing among young people in Saudi Arabia?
 - What is the impact of attitudes toward HIV testing, HIV/AIDS related knowledge and HIV risk perception on young people's intention to undertake an HIV test?
2. An examination of the impact of gender and age on attitudes toward HIV testing, HIV/AIDS related knowledge and HIV risk perception among young people in Saudi Arabia.

Research questions: What roles do gender and age play in developing young people HIV/AIDS related attitude, knowledge and risk perception?

- Is there a difference between young people's attitudes toward HIV across gender and age groups?
 - Is there a difference between young people's HIV/AIDS related knowledge across gender and age groups?
 - Is there a difference between young people's HIV risk perception across gender and age groups?
3. An exploration of how healthcare professionals working in the field of HIV/AIDS perceive the factors that influence the uptake of HIV testing among young people in Saudi Arabia.

Research question: How do HCPs perceive the factors that affect young people's intention to undertake an HIV test?

4. An examination of the relationship between healthcare professionals' accounts and young people's responses with regard to the influencing factors that affect the uptake of HIV testing.

Research question: To what extent do the qualitative interviews with HIV/AIDS healthcare professionals explain the quantitative data that have been collected from young people?

4.3 Research paradigm: pragmatism

A paradigm is a distinct form of theory or framework which influences the research process from the design to the interpretation of the findings (Mertens, 1998, p. 105). Guba and Lincoln, (1994) in their pioneering work, defined a paradigm as “*the basic belief system or world view that guides the investigator, not only in choices of method but in ontological and epistemologically fundamental ways*”. Therefore, the choice of paradigm

influences the selection of the research method and almost all the decisions made at each stage of the research. In addition, the paradigm provides guidance in understanding the complex world (Patton, 1990). Since the beginning of the “war” between the positivist paradigm and the constructivist paradigm, advocates of each side have attempted to challenge the meaning of reality and the relationship between the known and the knower. Certain sets of metaphysical concept have been addressed by each side; these include ontology, epistemology and ideology.

Different paradigmatic structures have guided research and scholars have long challenged each other in advocating their view of the world through a particular paradigm. The most common paradigms that underpin research include positivism, post-positivism, constructivism, critical theory and pragmatism (Denzin and Lincoln, 2005, Tashakkori and Teddlie, 1998). Since the choice of paradigm influences the research process, the aims and questions of the current research require both objective and subjective views. In addition, the problem under study is closely connected to its socio-cultural setting while its complexity demands a mixed method approach if it is to be explored comprehensively.

Pragmatism as a paradigm was inspired by Dewey’s philosophical interpretation of knowledge. Dewey (1925/2008) attempted to build a bridge between the two philosophies behind the positivist and constructivist paradigms. From a positivist perspective, reality exists in the world regardless of our understanding whereas constructivists insist that reality is determined by our understanding. Pragmatists believe that both notions of reality are equally important to understand the world thoroughly. Morgan (2014, p.4) stated that: *“On one hand, our experiences in the world are necessarily constrained by the nature of that world; on the other hand, our understanding of the world is inherently limited to our interpretations of our experiences”*.

The pragmatic paradigm has distinctive features which clearly differentiate it from dominant ones such as the post-positivist and constructivist paradigms. The most important feature that distinguishes the pragmatic paradigm is that it promotes an alternative way of thinking that values human experience over traditional metaphysical issues in understanding the world. Pragmatists emphasise the importance of human experience in informing actions and beliefs and move beyond the dualistic worldview of objectivity and subjectivity to emphasise the process of transaction between the mind and the environment. Hall (2013, p.17) pointed out this transaction link and stated that: *“the mind and world are in constant interaction with each other through transactions”*. Knowledge from the pragmatist perspective is both real and is also constructed by our conception of the world (Biesta, 2010).

The practicality of the pragmatic paradigm has been criticised as being *“naive”* (Tashakkori and Teddlie, 1998). However, limiting the pragmatic paradigm to the concept of “what works” downplays the wider philosophy of pragmatism that provides meaning of the world in terms of a theory of truth (Denzin, 2012). Morgan (2014, p.7) also stated: *“pragmatism presents a coherent philosophy that goes well beyond “what works”*. Basically, research inquiries in the pragmatist worldview are like any other daily life inquiries; however, they require a more thoughtful decision-making process. Thus, decisions related to the selection of the method to collect and analyse research data are actions that require an evaluation of whether or not the method will fulfil the research objectives. As Morgan (2013) noted, the central pragmatist concept in terms of research inquiries focuses on the difference that it will make to approach a research question using one particular method rather than another. So, it is not just simply a question of “what work?” but a rational selection of method based on evaluating the potential consequences that the selection of the method imposes.

Another common critique that purists claim invalidates the pragmatist approach to research inquiry is that allows for the integration of both positivist and constructivist approaches. It has been argued that these approaches are incompatible. However, pragmatists have pointed out that the fundamental aspect of the philosophy of pragmatism is based on the justification of selecting an approach to produce knowledge while disqualifying other approaches, regardless of the nature of the research methods. In addition, pragmatists believe that mutual relevance exists between both the positivist and constructivist approaches to research inquiries. Thus, the knowledge each approach produces is important in understanding the world.

It has also been stated that, using the pragmatic paradigm to approach a research inquiry, can be seen as an easy way to escape from dealing with the sophisticated philosophical issues related to knowledge creation. However, pragmatists have not ignored the issues related to epistemology as they focus on the human experience as a source of social knowledge. Pragmatists believe that all knowledge is based on experience and one individual's experience varies from that of another. However, knowledge is shared as individuals share the same social setting (Morgan, 2013).

In the context of the current research, the adoption of a mixed method approach which includes both quantitative and qualitative arms appeared crucial to answer the research questions. This produces a comprehensive picture about the research problem which cannot be obtained otherwise. In addition, it enables the researcher to contribute to the formation of knowledge about the factors that influence HIV testing among young people in Saudi Arabia.

Morgan (2013) noted that any successful research requires a meaningful research question and an appropriate method to address this question. Maxcy (2003) also highlighted that researchers need to be careful when selecting a method as they must

ensure that the selected method is appropriate to fulfil the purpose of the study. Therefore, the choice of research method is not based on the superiority of one method over another; its appropriateness is the key factor (Seale, 2012).

The purpose of the current research is to explore the factors associated with the low uptake of HIV testing among young people in Saudi Arabia. Both the epidemiological information and the research literature indicated an increase in the incidence and prevalence of HIV in Saudi Arabia. In addition, recent national reports have also suggested that the government is investing a considerable amount of its resources to tackle the problem of HIV/AIDS in the country. Despite the efforts being made by the Saudi health authorities in maintaining the availability of HIV/AIDS health-related services, including HIV testing, genuine barriers prevent the general public, and particularly young people, from seeking these services. Thus, a mixed method approach would better allow the factors to be assessed and explored thoroughly.

4.4 Mixed method approach

Mixed method research was founded in the late 1980s and since then it has gone through several stages of development. However, it is noted that Campbell and Fisk (1959) used multiple methods for psychological studies. In the early 1990s mixed method research began to take its current form which systematically combines quantitative and qualitative data using different types of research design. This combination requires attention to be paid to the distinct features of nomothetic and idiographic frameworks. The nomothetic framework is devoted to investigating issues across several cases where information is sought from a relatively large number of individuals. On the other hand, the exploration of the research problem from single cases is the main feature of the idiographic framework (Bernard and Bernard, 2012). In terms of the advantages and disadvantages of using either of these two frameworks, it is important to note that conducting research using a nomothetic framework indicates that the research is more objective compared to

those employing an idiographic framework. Conversely, idiographic research offers rich information about the experiences, beliefs and actions of individuals in a defined socio-cultural setting. Reich et al. (2000) stated that nomothetic and idiographic research are equally useful for examining the world; they complement each other to produce a more complete picture of the world.

According to Tashakkori and Teddlie (2010), integrating quantitative and qualitative methods assists the researcher in his/her journey to unveil reality in a way that would never happen if he/she used a single method. In addition, the difference between quantitative and qualitative research includes differences with regard to the purpose for conducting the research and the type of research questions that each of them would address. They also differ in their strengths and weaknesses. Therefore, mixed method research offers an opportunity to address more sophisticated research questions, augmenting the strengths and moderating the weaknesses of the two research approaches.

Five reasons for combining quantitative and qualitative research approaches are described in the extensive literature review conducted by Greene et al. (1989); these include: triangulation, complementarity, development, initiation and expansion. In addition, Bryman (2006) identified 17 potential reasons for using multi-methods in social science research by analysing the content of 232 published studies. These 17 reasons (stated by Bryman, 2006, p. 105-107) include:

- | | |
|--|--|
| a) “ <i>Triangulation</i> or greater validity” | b) “Sampling” |
| c) “Offset” | d) “Credibility” |
| e) “Completeness” | f) “Context” |
| g) “Process” | h) “Illustration” |
| i) “Different research questions” | j) “ <i>Utility</i> or improving the usefulness of findings” |

- | | |
|-----------------------------|---|
| k) “Explanation” | l) “Confirm and discover” |
| m) “Unexpected results” | n) “ <i>Enhancement</i> or building upon quantitative/qualitative findings” |
| o) “Instrument development” | (Bryman, 2006, p.105-107) |

The main reason for choosing a mixed method approach in the current research is to illustrate and enhance the "complementarity" of the overall results. Using a mixed method approach has advantages compared to the use of quantitative or qualitative research methods alone as it combines the strength of the two methods and minimises their weaknesses. Although a mixed method design appears to be a useful way of understanding and addressing certain research problems, a researcher applying a mixed method approach faces a wide range of challenges. Morgan (2013, p.4) stated: “*combining two methods often involves more than twice as much work as using a single method*”. Beside the extensive work required to collect data using both quantitative and qualitative techniques, the two sets of data need to be integrated properly. In addition, using a mixed method approach usually involves separate analysis of each set of data according to the nature of the data; however, integration is inevitable. Thus, mixed method research is both time- and resource-intensive; practical difficulties also feature in the integration of the two distinct methods.

The following section describes the study’s design and the procedural issues involved, as well as its application rationale in the current study.

4.5 Study design

The current study consisted of multiple phases divided into two main stages: the development stage and the main study stage. The development stage related to the development and assessment of the questionnaire, as well as to creating the primary topic list for the semi-structured interviews while the main study stage involved two main phases (i.e., quantitative and qualitative) of data gathering (See Figure 5).

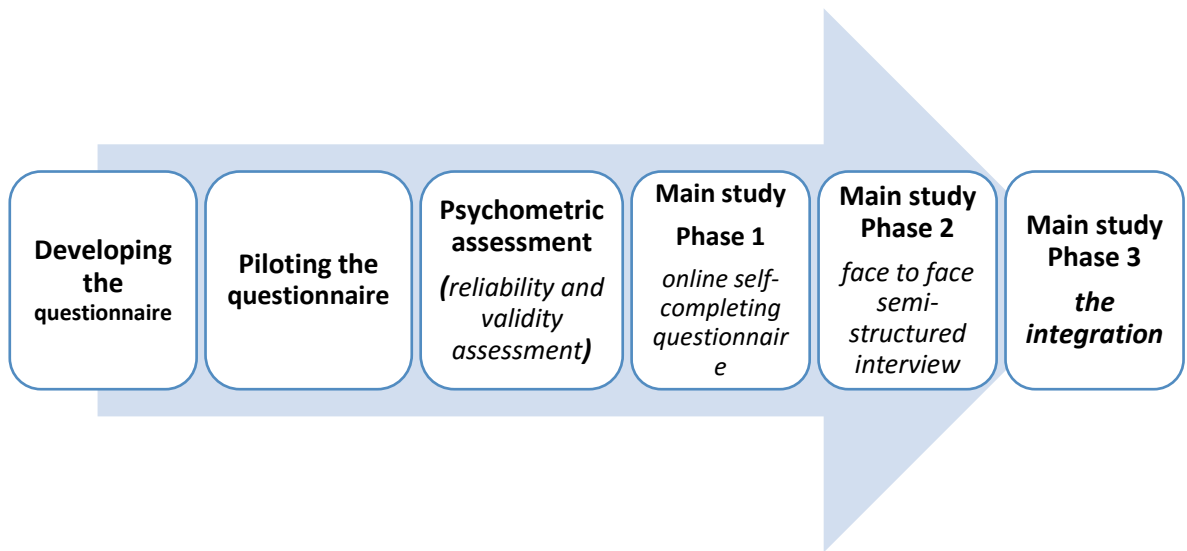


Figure 5: The stages of the study

4.5.1 Main study Phase 1:

The first phase of the second stage of the study involved an online self-completion questionnaire to assess participants' HIV/AIDS knowledge, HIV risk perception and attitude toward HIV testing. Additionally, the HIV testing history of the participants was included in the demographic information. The questionnaire content was informed by the literature review concerning HIV testing barriers while the questionnaire itself was piloted and assessed for its reliability and validity. This is discussed later in the chapter.

In developing the questionnaire, it was crucial to maintain the appropriateness of the items to be completed independently by the participants. In addition, extra care was also required in formulating the items, as the questionnaire was not only self-completed but was also completed on-line and so the participants did not have the opportunity to ask the investigator to clarify any aspect of the questionnaire. Using an online, self-completed questionnaire reduced the effect of the topic's sensitivity and encouraged participants from both genders to participate in the study. Pedhazur and Schemelkin (2013) argued that using a self-completed questionnaire helps to reduce sensitivity concerning a topic which, in turn, enables a researcher to recruit a larger sample.

4.5.2 Main study Phase 2:

The second phase of the second stage of the study involved semi-structured interviews to explore the factors associated with the low uptake of HIV testing among young people in Saudi Arabia. In addition, it also aimed to explain the findings of the first phase and relate the findings to practice in the country. The list of topics that guided the interview was influenced by the findings of the first phase.

The semi-structured interviews were conducted face to face which has clear benefits in terms of gathering focused and detailed information. Foddy (1993) noted that face to face interviews are one of the best interview approaches when used to explore issues relating to participants' experiences, beliefs and thoughts. Deciding on the method for data collection and the manner in which such data are to be collected are associated mainly with the nature of the research inquiry and the study population. For example, it was felt that telephone interviews would be less effective for gathering the required information given the fact that the focus of the research was a sensitive topic in Saudi Arabia. In addition, the flexibility offered by the semi-structured interview is an advantage that helps in guiding and promoting discussion as, during such interviews, the researcher is not restricted by list of questions or topics. Thus, the semi-structured interview technique enables a researcher to explore more complex matters which might arise in the course of the interview. Pedhazur and Schemelkin (2013) indicated that semi-structured interviews allow researchers to explore deeply any issues that are revealed during the interview and to explain meaning further.

4.5.3 Main study Phase 3:

The final phase of the study was to integrate the findings from phase 1 and 2, as well as to evaluate the extent to which phase 2 of the study was able to explain the findings of phase 1. In other words, this phase evaluated the ability of the semi-structured interviews

to clarify the findings revealed by the questionnaire. In addition, it also assessed the clarity of the whole picture following the integration of both strands of the study.

The following section of the chapter describes the procedural choices made by the researcher in order to achieve the research goals.

4.6 Research participants

The target population for the current study was young people aged between 17 and 25 years in Saudi Arabia. According to the World Bank report, Saudi Arabia's total population in 2014 was 30.8 million with young people aged 15 to 24 years comprising about 20 percent of the total population of Saudi Arabia. The study aimed to reveal the factors that influenced young people's decision to undertake an HIV test in Saudi Arabia. This aim was met by integrating quantitative and qualitative data gathering techniques.

The quantitative strand of the current study assessed young people's HIV/AIDS knowledge, attitude and risk perception, as well as exploring the HIV testing history of the participants. Thus, for the quantitative part of the study, the sample was drawn from university students aged between 17-25 years, particularly those enrolled on any course at Umm AL-Qura University. Although young people include individuals from various groups in the Saudi community, drawing the sample from university students had certain advantages. One such benefit was accessibility which might have been difficult to achieve if the study had tried to recruit participants from other youthful communities within the Saudi population. It also allowed comparisons to be made between and within the genders, since, in the University, young people of both genders were equally educated and of identical age. In addition, in 2014, universities in Saudi Arabia embraced about 76.7 percent of all Saudi secondary school graduates; this is considered to be among the highest percentages at an international level (MOE, 2015). Moreover, in comparison to other sectors, universities in general are well organised and this facilitates a researcher's

work in terms, for instance, of the sampling procedure, the data collection process and obtaining the required approval to commence the field work. In other words, recruiting university students to represent young people in Saudi Arabia is justified, since almost 77 percent of Saudi people aged between 17 and 25 are enrolled in one of the Saudi universities. Although complete representativeness is affected as university students do not represent all young people in the country, this sample was considered sufficient to fulfil the research objectives.

In terms of the qualitative part of this research, a group of HIV/AIDS health professionals were interviewed to obtain their views with regard to the research problem although the recruitment procedure did not favour a particular group of HIV/AIDS healthcare professionals and so only doctors participated in the study. The researcher attempted to recruit a wide range of HIV/AIDS health professionals including doctors, nurses and other health personnel who manage HIV/AIDS patients. However, this proved to be one of the most difficult tasks the researcher encountered during the data collection stage of the study and finally only three healthcare professionals participated in the study. These were doctors who had been working in the field of HIV/AIDS in Saudi Arabia for more than five years. Although only three HCPs participated in the study, two of them were key informants in the National AIDS Program (NAP) in the western province of Saudi Arabia.

Recruiting professionals for the interviews lent certain strengths to the study. Given the nature of the research problem, this provided a wider and clearer picture of HIV testing in Saudi Arabia and added valuable perspectives to the matter under investigation. It also helped to explain the quantitative results, as well as enhancing the overall conclusions. In addition, it also allowed for deeper understanding beyond the abstract statistics and scores, and assisted the researcher in his attempt to explore the research problem thoroughly.

4.7 Research location

The field work of the current research was carried out in the western province of Saudi Arabia, particularly in the two cities of Makkah and Jeddah. The quantitative arm of the study took place in Umm AL-Qura University which is based in Makkah. However, the qualitative arm of the study was conducted within NAP centres in both Makkah and Jeddah, as well as in one of the main hospitals in the Makkah region.

A. Umm Al-Qura University (quantitative strand)

Umm Al-Qura University is one of the oldest universities in the country. It was established under this name in 1981 although it was first founded three decades earlier as a faculty of Sharia law. In 2014 the number of undergraduate students enrolled in the University's undergraduate programmes reached approximately 87,000. Female students, at 54.5 percent of the total undergraduate students at the University, slightly outnumber their male counterparts. The University consists of 20 faculties which include 110 departments. The authorities of the University approved the research proposal and provided the researcher with the required permission to commence the field work. However, a list of students' email addresses was not provided due to its strict privacy regulations. The researcher was also asked to omit one of the questions included in the demographic information section of the questionnaire which enquired about religion.

B. Health care facilities (qualitative strand)

The National AIDS Program (NAP) was established by the Ministry of Health in Saudi Arabia in 1994. The NAP centres are distributed all over the 20 health administration regions whereas the main centre is located in Riyadh. In each health administration region there is at least one voluntary counselling and testing (VCT) centre, while there is a treatment clinic and mobile VCT facility in certain health administration centres such as Makkah. In addition, in some parts of the country, the VCT services are based within the primary healthcare centres. The NAP has appointed a coordinator in each city who acts

as a reference in the city and who liaises with the central unit in Riyadh. This position is usually assigned to a medical doctor who is certified in HIV/AIDS management and although each centre includes health and non-health personnel, this study was only concerned with healthcare professionals. The researcher recruited two HCPs from two different centres within the Makkah administration region. In addition, although one of the HCPs recruited was not a member of NAP in Saudi Arabia, he was, however, part of one of the largest specialised hospitals in the western province. The last participant was a well-known HCP working in the field of HIV/AIDS in the country.

4.8 Research procedure

For the current research project, it was apparent that a quantitative research method alone would be inadequate if the topic was to be understood clearly; likewise, neither was a qualitative research method alone felt to be adequate. Although a mixed method approach appeared to be a useful way of understanding the research problem in question, the researcher faced a wide range of challenges. For example, the mixed method approach was time-intensive as it required extensive data collection; also, the analysis of the data needed to be carried out separately because of the nature of the data.

The current research project employed an explanatory sequential mixed method design to address the research problem thoroughly. In using this design, the researcher attempted to explain the quantitative results using the qualitative data in order to explore the meaning behind the quantitative results (Creswell, 2013, Tashakkori and Teddlie, 1998, Morgan, 2013). The follow-up explanation variant model, one of the two variant approaches for explanatory sequential design found in the literature, was selected to inform the research. In this variant approach, the researcher attempts to dig deeper to obtain much more detail on the topic under study by collecting qualitative data following the quantitative data collection and analysis. In this study, the findings from the quantitative strand assisted the researcher in developing the prompts and the topic list

used in the interviews with the HCPs. The sequential contribution of the research project allowed the researcher to benefit from the strength of one method to influence the other (Morgan, 2013). In spite of the fact that the sample size differed in each strand, the two strands were not equally weighted in the research project. The emphasis in this study was much more on the quantitative strand of the study.

Thus, in order to investigate the factors that influenced the HIV testing seeking behaviours of young people in Saudi Arabia, two complementary forms of data, numerical as well as textual, were required. For the numerical quantitative data, an online self-administered questionnaire was completed by the university students while qualitative textual data were collected through semi-structured interviews with HIV healthcare professionals. As previously mentioned, both forms of data were analysed and collected in two distinct stages. Besides the need to explore the HIV testing barriers comprehensively from multiple perspectives, using an explanatory sequential mixed method design, enabled the study to contextualise the information.

4.8.1 Quantitative arm of the study

The quantitative strand of the current research employed a non-experimental, descriptive, cross-sectional design. The quantitative strand aimed mainly to assess the three globally recognised factors that influence an individual in seeking HIV testing services. These factors were: HIV/AIDS related knowledge, perception of risk and the attitude toward HIV testing. In addition, it also allowed the researcher to explore other potential factors confined to the population under scrutiny. The quantitative approach also offered a great opportunity to assess any differences in these influential factors across genders and age groups, as well as allowing the researcher to examine whether the effect of these factors among young people in Saudi Arabia were consistent with those noted worldwide.

The unit of analysis in this study was individual young adults and the target population was young people aged between 17 and 25 years living in Saudi Arabia. The study sample was drawn from undergraduate students at Umm Al-Qura University. Although recruiting university students could affect the representativeness of the sample, the University appeared to be an excellent place to recruit young people of both genders. In addition, recruiting university students helped the researcher to ensure that participants had the minimum required knowledge to complete the questionnaire. It was also the most suitable place to gain access to young females since the Saudi culture, tradition and regulations complicate communications between people of opposite genders. It is also worth noting that the University was selected based on its location in the western province of Saudi Arabia where the HIV rate is the highest in the country.

The quantitative research instrument was a questionnaire developed by the researcher. The questionnaire included five main sections: demographic information, HIV/AIDS related knowledge, individuals' perception of HIV risk, attitude toward HIV testing, and HIV testing history. Although the questionnaire was developed especially for this project, most of the included items had been used previously.

The questionnaire was translated into Arabic to ensure that it was understood by the students since Arabic is the official language in the country. The questionnaire was piloted before and after the translation process to test that the wording, language, instructions and information were all clear. The questionnaire was also assessed for its reliability and validity to ensure that the outcomes were trustworthy. It was then designed using the SurveyMonkey platform and distributed as well as completed through the web medium to gather the required information from the study population. A website link was disseminated using a variety of methods such as via social media, the University's student club, and college forums. It was noted that the Internet- or web-based method of administering questionnaires had certain advantages over telephone, mail and face to face

methods since it was cheaper and also saved time (Cobanoglu et al., 2001). In addition, using a web-based method also facilitated the data analysis process (Rea and Parker, 2012). Moreover, for the purpose of the current study and the characteristics of the study population, using the web-based approach to collect the questionnaire data seemed to be the most effective method. Young people in Saudi Arabia are similar to their counterparts worldwide in the use of smart phones to surf the internet. Ziani et al. (2015) found that young people in the Gulf Cooperation Council, which includes Saudi Arabia, were using mobile phones as multi-functional devices. Thus, they are used for communication, social networking and learning. As most of the web-based survey platforms, including SurveyMonkey, are mobile phone- and tablet-friendly, such a method is therefore superior to the use of conventional modes of distributing and information gathering via questionnaires.

4.8.2 Qualitative arm of the study

The qualitative strand of the study recruited a different group of participants. Qualitative research aims to provide more in-depth details about an issue (Greener, 2011). For the purpose of the current research, a basic descriptive qualitative research design was utilised to explore the perspectives of HIV health professionals about the factors that might affect or influence young people's seeking behaviour in terms of HIV testing in Saudi Arabia. The rationale for employing a descriptive qualitative research design was the suitability of such a design to fulfil the goal of this part of the study. Carrying out a descriptive study helps in exploring issues of interest and in classifying the information obtained. A purposive sampling technique was used to recruit HIV/AIDS healthcare professionals. These professionals were recruited if they contributed to the management of HIV patients or had provided HIV testing and counselling in any healthcare centre for more than three years. This was done in order to ensure that each participant had the required experience and knowledge to share. In addition, only health professionals were included while social

workers, administrators and managers were excluded because their views were unlikely to reflect the true situation as their interactions with those seeking HIV testing were minimal. National AIDS Program (NAP) centres in the western province were the main sites for recruiting eligible participants since NAP is the cornerstone of HIV/AIDS in Saudi Arabia. However; eligible participants from other healthcare centres were considered.

Data for the qualitative strands of this study were collected using face to face, semi-structured, open-ended, in-depth interviews. This data collection procedure was selected as it allowed the participants to express their experiences, opinions and beliefs in detail. The semi-structured interview had advantages over other forms of qualitative data collection method, such as focus group discussions and structured interviews since it is flexible in terms of time and the depth of the discussion. In addition, it would be difficult to get the participants involved in a group discussion because of the sensitive nature of the topic.

The interviews were guided by a topic list which was developed following preliminary analysis of the quantitative data (i.e., questionnaire data). The participants were provided with the topic list guide prior to the interview, as well as the study information sheet and the consent form when they were approached. The approximate duration of each interview ranged between 25 to 40 minutes; this was due to the level of interaction between the interviewer and the participant, as well as the length of participants' responses to the questions. The interviews were audio-recorded using a digital recorder. This use was authorised by the participant to ensure that each interview transcripts was complete and matched exactly the participants' words, as well as to facilitate the data analysis process. The data were encrypted and saved securely to make sure that the researcher was the only one who could access the data. Moreover, the privacy of the participants was ensured by conducting the interview in participants' private offices

within the healthcare facilities which were locked during the interview. The interviews were conducted in Arabic and were then translated into English by the researcher.

4.8.3 Piloting

The term “pilot study” in social science research has two different meanings. It may refer to a small-scale version of the actual study which is conducted mainly in order to assess the study’s feasibility; the term can also be used when testing a research instrument, such as a questionnaire, for its consistency (Van Teijlingen et al., 2001). The first stage of the piloting was conducted to assess the questionnaire’s wording, the clarity of its instructions and to pinpoint any issues that might affect the ability of the participants to complete the questionnaire successfully. In addition, at this stage, the researcher was able to estimate the time needed by the study participants to complete the questionnaire. On the other hand, the second stage of piloting was conducted to assess the questionnaire’s reliability as well as its validity. In term of reliability, a test re-test reliability assessment technique was employed whereas validity was assured through a content validity assessment.

The following part of this section explores the two distinct stages of piloting the questionnaire and its findings.

A. 1st stage assessment of the technical issues

For the purpose of this stage, four participants were recruited to assess the questionnaire’s feasibility. The four participants were Saudi university students studying at Umm Al-Qura University; they were enrolled on different undergraduate courses at different levels. Two of them were male and the other two were female; their ages ranged from 19 to 24 years. The participants in this stage were asked to complete the questionnaire and also to offer feedback. It was noted that the time needed to complete the whole questionnaire ranged from 10 to 15 minutes which was determined long by the male participants and fair by the females. Three participants commented that the instructions given for one of

the questions were unclear. In addition, it also appeared that the wording of three statements within the attitude toward HIV testing section needed to be revisited since all four participants pointed out that at least one of these three statements confused them. In general, in spite of the fact that some technical issues required attention, all four participants found the questionnaire fairly easy to complete.

B. 2nd stage assessment of reliability and validity

In order to attain an effective conclusion concerning a study's findings, the instrument used to obtain the results should be assessed for its reliability and validity. The reliability of the newly developed questionnaire was assessed in this study using test/retest reliability while validity was evaluated through a content validity assessment. The following two sections explore the results of the reliability and the validity assessments of the questionnaire.

C. Test retest reliability assessment

Reliability of scale refers to the consistency and reproducibility of measurements (Streiner et al., 2014). The questionnaire used in the quantitative strand of the study was a newly developed one and therefore, assessing its reliability was essential if a valued conclusion was to be drawn. The scores for the three scales included in the questionnaire were: HIV/AIDS related knowledge score, risk perception score, and attitude toward HIV testing score. A test/re-test strategy was adopted to assess the reliability of the questionnaire and 51 individuals who completed the questionnaire for the first time were recruited from the population being studied. At the retest, only 27 individuals completed the questionnaire and therefore, the responses from the remaining 24 individuals were excluded from the analysis. The time interval between the two occasions of administering the questionnaire was approximately one week.

Statistically, the intra-class correlation coefficient (ICC) was used to assess the test/re-test reliability of the three scales. Although there is no general agreement about the magnitude of the ICC, an ICC which is greater than 0.75 is considered to represent an excellent degree of reliability whereas an ICC value between 0.4 to 0.75 represents a fair to good degree of reliability (Peeler and Anderson, 2008, Shrout and Fleiss, 1979).

The test/re-test statistics for the HIV/AIDS related knowledge scale showed a good degree of reproducibility as the single ICC measure was 0.68. Therefore, 68 percent of the variance in the scores between the two occasions was “real” (Table 1). The mean difference between the variation of the two occasions of administration for the HIV/AIDS related knowledge score was 0.074 ± 1.77 (Table 1).

The reliability testing for the risk perception scale revealed an excellent degree of reproducibility as the single ICC measure was 0.79. Thus, 79 percent of the variance in the scores between the two occasions was “real” (Table 1). The mean difference between the variation of the two occasions of administration for the risk perception score was 0.037 ± 1.87 (Table 1).

A good degree of reproducibility was also evident for the attitude toward HIV testing scale since the single ICC measure was 0.65 which confirmed that 65 percent of the variance in the scores was real (Table 1). The mean difference between the variation of the two occasions of administration for the attitude toward HIV testing score was 1.56 ± 11.39 (Table 1).

Scale	ICC _(3,1)	Mean difference (SD)
HIV/AIDS related knowledge scale	0.68	0.074 (1.77)
Risk perception scale	0.79	0.037 (1.87)
Attitude toward HIV testing scale	0.65	1.56 (11.39)

Table 1: The scales' reliability reporting the ICC and the mean difference with the standard deviation

D. Content validity assessment

Any instrument is not determined as valid unless it is reliable and so validity assessment is a distinct mandatory evaluation of a measurement which refers to whether or not the instrument measures what it purports to measure (Streiner et al., 2014). Although the three scales included in the questionnaire appeared to be reliable and constant, they still needed to be validated. In other words, the instrument could be reliable but might not measure what was intended.

One way to assess the validity of a newly developed questionnaire is to ensure that the items included in each scale are relevant to the construct being measured (Polit and Beck, 2006, Bannigan and Watson, 2009). Therefore, five experts in the area of HIV/AIDS were asked to rate the items in the questionnaire according to their relevance to the construct on a 4-point Likert-type scale. The content validity index (CVI) was then computed with both the item-level content validity index (I-CVI) and the scale-level content validity index (S-CVI) being used to comment on the validity of the three scales included in the questionnaire. The S-CVI for the three scales (HIV/AIDS related knowledge, risk perception and attitude toward HIV testing) were 0.98, 1 and 0.96 respectively (Table 2). The assessment revealed that the content validity of the three scales was acceptable as the standard criterion for acceptability should be no less than 0.90.

Scale	Number of items	I-CVI	S-CVI
HIV/AIDS related knowledge scale	12	ALL the items I-CVI= 1 except item No.8 I-CVI= 0.8	0.98
Risk perception scale	3	ALL the items I-CVI= 1	1
Attitude toward HIV testing scale	37	ALL the items I-CVI= 1 except Items No. (6,12,14,19,20&24) I-CVI= 0.8 and Item No. 21 I-CVI= 0.6	0.96

Table 2: The three scales' content validity computed using both I-CVI & S-CVI

4.9 Sampling

In terms of sampling for quantitative strand of the study, a non-probability, convenient sampling technique was utilised to recruit the students to complete the questionnaire. Using a non-probability sampling technique can introduce bias and may affect the generalisability, as well as the transferability, of the results (Mimiaga et al., 2009). However, using a probability sampling technique for this research project seemed unfeasible for various reasons. One of these reasons concerned accessibility since, in order to use probability sampling, access to the registration lists of university students was required and this was almost impossible to attain. In addition, even if access to this list had been granted, it would have been difficult to contact the selected students, especially female students. Moreover, given the nature of the research topic, which is highly sensitive, particularly in a Saudi context, the response rate could have been severely affected which might, in turn, decrease the credibility of the overall conclusion.

In term of qualitative strand of the study, a non-probability, purposive sampling technique was adopted to recruit the HCPs. The researcher approached 25 eligible individuals

working in four NAP centres, two hospitals and one charity organisation in two cities, Makkah and Jeddah. However, only three of the HCPs who met the inclusion criteria took part in this strand of the study. Although three participants may seem insufficient to obtain comprehensive information about the inquiry of interest, the depth of the information obtained from those three HCPs showed this number to be reasonable. In addition, two HCPs participated in the study were key individuals in the NAP in the Makkah region while the other participant was one of the most prominent HCPs in the country in the field of HIV/AIDS. The only unfavourable feature of the qualitative strand sample was that all three participants were medical doctors which might limit the study's ability to reflect the experience of nurses and other HIV practitioners.

4.9.1 Sample size

The sample size for the quantitative strand was calculated based on the total population of undergraduate students at Umm Al-Qura University which was approximately 87,000 students. The margin of error was set at five percent with a confidence level of 95 percent. Therefore, the sample size calculation revealed that the sample required should be at least 381 participants.

4.10 Research instruments

4.10.1 The questionnaire

As a quantitative measure, a questionnaire was designed to collect data from the university students. First, demographic information, such as age, sex, nationality and field of study, was collected. Another section of the questionnaire examined participants' HIV/AIDS related knowledge and a score was obtained for the level of that knowledge. Although the questionnaire was developed especially for this project, most of the items included had been used in previously published studies. The four contextual sections of the questionnaire are described in the following section.

- **HIV related knowledge**

This section of the questionnaire mainly originated from and was influenced by the 18-item HIV knowledge questionnaire developed by Carey and Schroder (2002). However, six items were omitted as they broached extremely sensitive subjects which are rejected by Saudi socio-cultural norms. For example, anal sex is forbidden in the Islamic religion as well as being unacceptable in Saudi society. The final 12 items in the questionnaire assessed the participants' knowledge about various aspects of HIV/AIDS which included its transmission, prevention, epidemiology, severity and progression. To respond to each item, three options were offered to participants: namely, true, false and do not know. A score was calculated by giving each correct response one point. Thus, the final score ranged from 0 to 12.

- **HIV testing history**

The questionnaire included a section to count the number of those previously tested, as well as those who had never been tested for HIV. According to the individual's HIV testing history or status, he/she was directed to choose the most important reason for being or not being tested for HIV. The list of reasons for not being tested previously included the barriers identified in previous related studies: awareness (lack of information offered by the education system, the government, health providers, etc.); perception of the disease (low-risk perception, fear of the disease, fear of disclosure and stigmatisation, etc.); accessibility (perception of high costs, lack of infrastructure, poor co-ordination, gender-related cultural and practical issues, etc.) (Deblonde et al., 2010, Mahendradhata et al., 2008, Mills et al., 2011). On the other hand, those who had been tested for HIV were also asked to determine the reason behind taking the HIV test. In terms of the reasons for getting the HIV test, a list was developed. This list included: healthcare provider request, for the purpose of a surgical procedure, employment, mandatory pre-marital test, etc.

- **HIV risk perception**

Three items were included in this section, each of them aiming to evaluate the individual's perception of his/her risk of contracting an HIV infection. The three statements expressed thoughts that might deceive a young individual into thinking he/she was at a very low or no risk of HIV infection. A five-point Likert type scale was used to measure individuals' level of agreement with each statement, with the score for each statement ranging from 1 to 5 where 1 represented strong agreement with the statement. The total score for each participant was then computed by adding together the individual's response to each statement.

- **Attitude toward HIV testing**

This section, which was greatly influenced by Boshamer and Bruce's (1999) scale developed to measure attitudes about HIV antibody testing, was the leading part of the questionnaire aimed at evaluating whether the individual had a favourable or unfavourable attitude toward HIV testing. The evaluation here was accomplished by rating 37 statements in terms of the level of agreement indicated by the individuals for each statement. Therefore, this part of the questionnaire included 37 statements which were rated on a five-point Likert rating scale. Thirteen statements were denoted as facilitators to undertake an HIV test for which a reverse rating was applied; thus, five points were given to strong agreement for these items. On the other hand, 24 statements were denoted as barriers to undertake such a test; for these, strong agreement was given one point. The 37 statements were divided into six categories: confidentiality, relationship matters, fears, beliefs, trust, and the testing process. In addition, each category consisted of a number of statements so each participant's overall score was the sum of the rating of the 37 statements, thus ranging from 37 to 185.

❖ *Translation*

The questionnaire was developed in English and then translated into Arabic. The translation process was achieved through the voluntary contribution of two PhD students both studying in the UK; both had excellent English language skills and both had Arabic as their mother tongue. The researcher and one of the two PhD student volunteers translated the questionnaire into Arabic separately. Then, they discussed the differences and agreed on the final Arabic version. Finally, the second PhD student volunteer translated the Arabic version back into English. This looked similar to the first English version although some words were in a different form or were a synonym of the original word. Some changes were made to the Arabic version at the end of the translating back process.

4.10.2 The researcher

For the qualitative part of the study, the researcher was the instrument for data collection since developing the interview questions and topics, as well as asking the participants questions, were the researcher's responsibility. As semi-structured, in-depth interviews were employed, the researcher also reacted and responded according to the participants' answers. Thus, in-depth data which explored the HIV testing barriers affecting young people in Saudi Arabia from HIV health professionals' perspectives were obtained through the semi-structured interviews. The semi-structured interviews also helped in explaining the findings that arose from the questionnaire, as well as in exploring the social aspects of HIV in society.

As in any qualitative research, the researcher's social positioning and his/her preconceptions are critical issues that need to be acknowledged. Ruby (1980) highlighted the importance of the researcher's social positioning in the process of knowledge creation through research. In other words, the researcher's preconceptions influence each stage of the research from the selection of the topic until the writing up of the report. The following

description is offered in the light of this, and a reflexive analysis was also conducted which is included in the discussion chapter of the current thesis.

The researcher is a 31 years-old Saudi male, born and raised in the western province of Saudi Arabia. He belongs to a middle class social background and is considered highly educated. He received his general education, as well as his undergraduate study, in Makkah. He graduated from the Faculty of Medicine at Umm Al-Qura University with a Bachelor's degree in Medicine and Surgery. He was sponsored by the Saudi government to undertake postgraduate studies in the United Kingdom. Education is considered the key to a good quality of life in the researcher's family. His medical profession, as well as studying abroad, has offered him an excellent opportunity to explore cultural issues that shape individuals' attitudes and behaviours.

Selecting HIV/AIDS as an area of research was directed and influenced by the researcher's experience working as a medical intern. During the internship year, he was surprised by the stigmatising behaviours of HCPs when handling HIV patients. In addition, the postgraduate course in Public Health onto which he was enrolled also increased his desire to carry out a PhD study in HIV/AIDS in Saudi Arabia. The reflexivity section in the discussion chapter explores these issues further. Indeed, the reflexive analysis conducted by the researcher helped him to better understand himself as an investigator, as a person and as a PhD student during the process of the study.

❖ Ensuring the quality of the qualitative data

Sandelowski and Barroso (2002) argued that it is always difficult to appraise the value of qualitative research because opinion contrasts so sharply about how to measure its reliability. The differing viewpoints can be broken down into three schools of thought which are influenced by the wider philosophical debate about reality.

Wainwright and Forbes (2000) stated that relativists put little value on measuring reliability although they are opposed by those who claim it is necessary to show that social groups possess certain consistent values. Hope and Waterman (2003) described relativists as adopting a “positivist” stance whereas those on the other side of the debate use specific measurements to analyse qualitative data. They add that the third school of thought rejects both standpoints.

Hammersley (2013) argued that assessing qualitative data for truth or falsity depends on the aims and objectives of the research. If the research’s aim is to seek understanding of a particular social context, or to explain this context and the perspectives of different actors, then the need to assess the research’s validity is not essential. On the other hand, if the data generated from the study are used as a source of information about a particular social context, then it is important that the ‘truth’ of the account is safeguarded. Hence, the main purpose of the qualitative strand of the current study is to explore the perspectives of HCPs about the factors that influence young people’s behaviour in terms of seeking HIV testing in Saudi Arabia. Moreover, since the HCPs’ accounts were considered a source of information, it was therefore necessary to confront the issue of ‘truth’.

The terms ‘reliability’ and ‘validity’ are traditionally rooted in the positivist paradigm which mainly endorses quantitative research methodologies. Thus, these terms have been widely questioned for their appropriateness in qualitative research. Lincoln and Guba (1985) argued that different terms and criteria should be used to ensure the quality of qualitative research, as such, research is based on a set of beliefs and assumptions which is distinct from that of quantitative research. Thus, they suggest that the trustworthiness of qualitative research should be maintained rather than its reliability and validity. In the current study, the trustworthiness of the qualitative data were assessed using the position held by Lincoln and Guba (1985) who suggested that the assessment of trustworthiness

should include appeals for credibility and confirmability. Additionally, as aforementioned, a reflective account is included in the discussion chapter as a form of quality assurance.

A. *Credibility*

Credibility in qualitative research is comparable to internal validity in the positivist stance. However, it is concerned with the extent of reality embedded in the study findings. Lincoln and Guba (1985) argued that the single most important aspect of the trustworthiness of a qualitative study is credibility. In this study, the triangulation method was used to ensure its credibility. This involves combining a minimum of two methods of collecting data and it is both a practical and popular method of testing data's credibility. Guba (1981) advocated the use of triangulation, claiming that it both clarifies and improves the quality of data. Patton (1999) identified four different types of triangulation that can be used to enhance credibility: method triangulation, triangulation of sources, analyst triangulation and theory/perspective triangulation. He recognised that alternative approaches to questioning and different respondents can both lead to contrasting conclusions, but believed that triangulation offers both consistency and a greater understanding of the various approaches used. However, opponents of this strategy to assess the quality of data, such as Silverman (2006), argued that utilising such a strategy is misleading as it suggests that there is one overarching reality. To conclude, using triangulation as a means of assessing credibility does not suggest that there is an overarching reality; rather, it offers an opportunity to understand the relationship between distinct approaches. In addition, it allows the researcher to identify problems within each approach.

B. *Confirmability*

Confirmability relates to the data's reliability, with particular reference to the lack of an investigative bias. Lincoln and Guba (1985) emphasised its importance for qualitative questioning. There are various strategies to ensure confirmability. The current study

achieved it through the use of a second researcher whose role was dedicated to analysing the data, thus ensuring that a consensus was reached in relation to codes, themes and categories.

C. Reflexivity

Reflexivity involves the need to maintain self-awareness at every stage of the research process. Researchers should detail their preconceptions, all prior experience and those environmental considerations that might influence any part of the study, from its beginning to the end.

4.11 Data analysis

The data analysis for this study included both quantitative and qualitative data analysis techniques. The sequential nature of the study design required the quantitative data (the questionnaire information) to be analysed prior to the collection of the qualitative data (the interviews). Therefore, the description of the data analysis process is divided into two distinct parts:

4.11.1 Quantitative data analysis (the questionnaire)

The quantitative data were analysed by performing different methods of data analysis which included descriptive and inferential statistical analysis. SPSS software was used to analyse the questionnaire data. The descriptive statistics offered a great deal of information that helped the researcher to familiarise himself with the data in general and the respondents' characteristics (Pallant, 2013).

In addition, the mean difference between the HIV/AIDS related knowledge, risk perception and attitude toward HIV testing scores of males and females were measured using one parametric test, the t-test. The t-test was selected because the data appropriately met four assumptions although it violated the random sampling assumption. Violating the random sampling assumption is less serious and did not disqualify the application of a

parametric test such as the t-test on the data. On the other hand, the normality, independency and homogeneity assumptions were met and therefore parametric tests were selected in order to assess differences in the mean scores. The parametric tests were not only used to assess the difference across the genders, however. The one-way ANOVA test was also used to assess the mean scores difference across age groups. Exploring relationships between certain variables was established using Spearman's rho coefficient with the significance level being set at $p = 0.05$. A non-parametric test was used to assess the association between certain variables because one of these variables, the 'willingness to be tested for HIV', was considered to be ordinal.

4.11.2 Qualitative data analysis (the interview)

The qualitative data were analysed using the strategy of thematic analysis. Thematic analysis focuses on findings patterns in the data which can be gathered and interpreted under major themes. According to Braun and Clarke (2006, p.81), "*Thematic analysis can be an essentialist or realist method, which reports experiences, meanings and the reality of participants, or it can be a constructionist method, which examines the ways in which events, realities, meanings, experiences and so on are the effects of a range of discourses operating within society*". The six phases of thematic analysis strategies explained by Braun and Clarke (2006) were adopted to guide the analysis process (Table 3). Following the transcription of the audio-tape of the interviews, all three interview transcripts were translated into English and then the analysis of the data set began with the familiarisation phase. The researcher read and re-read the data and recorded his initial thoughts. Then, the data were systematically coded and similar codes were grouped together to initiate a poll of potential themes. After that, the phases of checking, reviewing and refining the themes and codes against the data set were completed. Subsequently, the final report was written which included the final themes that interpreted the data set in relation to the research questions.

Familiarising yourself with your data
Generating initial codes
Searching for themes
Reviewing themes
Defining and naming themes
Producing the report

Table 3: Phases of Thematic Analysis (Braun & Clarke, 2006)

4.11.3 The integration

The two strands of the study were linked at two distinct points during the course of the study. The first occasion was following the collection of the questionnaire data and its preliminary analysis. The purpose at that time was to inform the process of generating a topic guide for the interview phase of the main study. Then again, both strands were integrated following the full analysis of the data of the two strands separately. Finally, the researcher attempted to interpret or find meaning in the quantitative results by using insights from the qualitative thematic analysis. Here, an effort was made to make sense of the study as a whole in the light of the literature and theories.

4.12 Ethical considerations

As the area of research is considered highly sensitive in Saudi Arabia, close attention was given to certain aspects which might affect the study at different levels. One of these issues was the confidentiality and anonymity of the participants' personal information. For the questionnaire, a covering letter containing information about the general purpose of the study, as well as the procedures involved, was included at the beginning of the online questionnaire. In the information sheet a statement clearly indicated that responding to the questionnaire would not include questions about or request information such as names, ID numbers and email addresses which could disclose the participants' identities. Similarly, those who participated in the face-to-face interviews were also informed twice about the strict confidentiality applied in this research project which would make it impossible to identify them or the institute at which they worked. The

researcher was the only one able to identify participants in the interview phase and the information collected was thoroughly anonymised to make identification of any individual impossible. For example, each participant's name was replaced with a code which could only be identified by the researcher. In addition, quotations extracted from the interviews and displayed in the research reports, publications and the thesis could not be traced back to the participants. Moreover, the digital audio-tapes of the interviews were securely saved and encrypted. The researcher ensured that the data were stored according to the Data Protection Act (1998) (www.opsi.gov.uk/ACTS/acts1998/19980029.htm). An extra copy of data, including the quantitative results and interview transcripts have been encrypted and saved in an external storage device. Five years after the end of this project, they will be destroyed.

The autonomy of participants is another ethical consideration that was addressed during the course of the study. In the information sheets provided for both the questionnaire and the interview, participants were given clear advice about the voluntary participation scheme adopted in the current research. The researcher ensured that the participants were aware of their right to withdraw from the study at any time. However, completing the questionnaire indicated that the participant agreed that his/her response could be used for the current research project only. The participants in the qualitative strand (the interviews) were assured that they had the right to withdraw from the study or terminate the interview at any time during the interview session.

The researcher always attempted to ensure that the study results and procedures did not cause any harm to the participants or to society. Although physical harm was unlikely in this research project, certain measures were taken to assure the privacy, anonymity and confidentiality of the participants. The questionnaire information sheet included information and contact details for HIV testing services. The researcher's contact details were also included in case any participant needed to inquire about the study or any

services, such as HIV/AIDS support societies and health-related services. In addition, participants in the interview part of the study were also informed of their right to refuse to respond to any questions, as well as their ability to discuss any sensitive issues ‘off the record’ (not recorded).

The researcher attempted to ensure that the research was beneficial to the study population and to the whole of society as the study aimed to provide crucial information on the factors influencing young people’s HIV testing seeking behaviours in Saudi Arabia. Identifying these factors is the first crucial step for planning and establishing programmes that address them and therefore this study has the potential to provide a useful basis for health service providers and governmental institutions.

Ethical concerns may arise at any point of a research study even when a researcher has carefully planned his/her project. Thus, the researcher reviewed all the ethical considerations during the different phases of the study and attempted to manage any ethical issues that emerged.

The investigator completed the ethical approval requirements for the Faculty of Health and Social Care Ethics Committee and this Committee then reviewed the proposal and approved the project in June 2014; the field work thus commenced in July 2014. In addition, permission was also obtained from Umm Al-Qura University to conduct the study within the University and recruit students enrolled in any of its undergraduate courses. It is also important to note that permission to gain access to the healthcare facilities was granted from each healthcare facility.

4.13 Difficulties and limitations

Problems arose as a result of the sensitivity surrounding HIV/AIDS in Saudi Arabia; this sensitivity has led the disease to be highly stigmatised and often considered as a punishment for religiously and morally intolerable conduct (Schwarcz et al., 2011).

Therefore, it was a difficult task to convince participants, especially female students, to take part by either completing the questionnaire or participating in the interview part of the study. Carrying out a confidential interview with female health professionals was problematic as a face-to-face meeting between unrelated couples of the opposite gender is prohibited in the Saudi socio-cultural setting. However, this prohibition is not strictly applied in the healthcare sector since the working environments in healthcare facilities require individuals of both sexes working together.

As this research project utilised a mixed method approach, various quantitative validity concerns, as well as issues related to the robustness of the qualitative results, were considered. One of the quality concerns that might have affected the robustness of the quantitative strand was the non-probability sampling technique that was used since employing non-probability sampling could affect the generalisability of the results. However, the sensitivity of the study topic and other logistical matters made the use of a probability sample almost impossible. In addition, sampling errors were difficult to calculate as the sample was not randomly selected. Despite all the advantages of recruiting university students to represent people aged 17 to 25 in Saudi Arabia, it could be argued that university students are not a representative sample of the target population.

Mixing quantitative and qualitative methods in the same research project has been criticised for its lack of an epistemological base. However, both methods used in the current research project fulfilled certain aims and responded to the research questions and it is believed that the quality of research depends mostly on the appropriate selection of research tools rather than a specific epistemological stance (Ritchie et al., 2013). Designing the qualitative phase and the quantitative one at the same time could also affect the quality of this study. As in the explanatory sequential design, the qualitative phase depends on the quantitative findings. However, delaying the design of the qualitative

phase until the quantitative phase was completed could have hindered the procedures for obtaining the necessary ethical approvals.

4.14 Chapter summary

In this chapter the philosophical assumptions and the practical methodological choices have been discussed in relation to the research's aim and questions. The chapter also discussed ethical considerations and how the researcher approached them in this research project. The chapter focused on topics related to the research design, including those related to research participants, location, procedures, instruments and analysis. Finally, some of the difficulties and limitations in relation to the methodology were discussed.

The following chapter presents the findings of the present research based on the data collected through the research methodology.

5 Results Chapter

5.1 Introduction

In this chapter the results that emerged from both the quantitative and the qualitative strand of the study are reported. The quantitative data were collected through an online self-completed questionnaire. In addition, qualitative data were collected through face-to-face semi-structured interviews with HIV/AIDS health care professionals. These results are presented in the following order: firstly, the test/re-test reliability and the content validity assessment are discussed. Secondly the preliminary findings are presented; these include general descriptive information of the study sample, such as demographic information, and the mean and standard deviation of each scale score measured. Thirdly, the research questions are addressed by employing a variety of statistical tests. Then, additional statistical analysis is considered in order to examine the correlation between certain variables which might highlight unanticipated findings. Finally, the qualitative findings are presented and analysed using qualitative descriptive methods.

5.2 Quantitative findings

The quantitative strand study sample consisted of university students aged between 17-25 years who were recruited from one of the largest Saudi Arabian universities, Umm Al-Qura University. Umm Al-Qura University is located in the western province of the Kingdom of Saudi Arabia and its main campus is based in the holy city for all Muslims, Makkah.

Two questions were included at the start of the questionnaire, one being to ensure that the participant consented to participate in the study and the other to ensure that the participant was qualified so to do. Respondents who chose to refuse to participate and those who appeared ineligible were directed to a polite disqualification/completion page. Fourteen respondents out of 500 opted to refuse to take part which represented 2.80 percent. On

the other hand, 78 respondents out of 482, which represented 16.18 percent, were excluded as they appeared ineligible for the study either because they were not attending any course at Umm Al-Qura University and/or their age was not between 17-25 years.

The quantitative strand data of the study were collected using a questionnaire which was divided into four sections in addition to the section concerning personal information. Three variables, namely the HIV/AIDS related knowledge score, the HIV risk perception score, and the attitude towards HIV testing score, were investigated to determine the differences in the means of these scores across gender and age groups.

5.2.1 Study sample's demographic information

The study sample comprised 116 males and 278 females, representing 29.4 percent and 70.6 percent respectively. The ages of more than the half of the study sample fell between 20 to 22 years whereas those who were aged between 17-19 years and 23-25 years represented 34.8 percent and 14.7 percent respectively (Table 4). In terms of marital status, about 93 percent of the participants were single while only 5.6 percent were married. Only 11 participants were not of Saudi nationality, which represented 2.8 percent, while both parents of about 94 percent of the participants were Saudi nationals. Moreover, 4.8 percent of the participants had only one parents who was a Saudi national while, for 1.3 percent, neither of their parents were Saudis.

Age groups	N (%)
17 - 19	137 (34.8)
20 - 22	199 (50.5)
23 – 25	58 (14.7)
Total	394

Table 4: The number of participants with their percentage in each age group

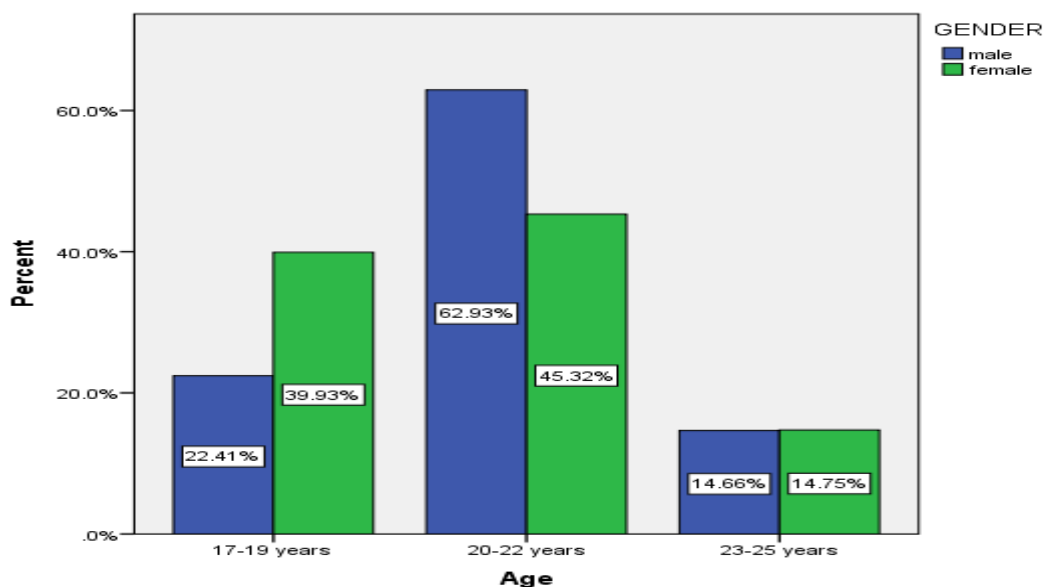


Figure 6: The percentage of the participants' age groups across genders

5.2.2 HIV testing information

In response to the questions that focused on their HIV testing history, approximately 95 percent of the participants had never been tested for HIV while only 20 participants had been tested; this represented about 6 percent (Table 5). In addition, about 48 percent of the participants stated that the main reason for not being tested for HIV was because it was unlikely that they had been exposed to HIV. However, nearly 36 percent of the participants claimed that no one had offered them the HIV test as the main reason for not being tested while, for about 16 percent of the participants, their main reason was that they did not know where to get tested (Table 6). On the other hand, about 25 percent of those who had been tested previously for HIV selected the mandatory pre-marital test as the main reason for undertaking an HIV test (Table 7). The participants' willingness to be tested for HIV during the following year was recorded in five categories, as follows: 75 (20.8%) were strongly willing, 110 (30.6%) were willing, 30 (8.3%) were unwilling, 31 (8.6%) were strongly unwilling and 114 (31.7%) were uncertain about their intention to be tested for HIV in the following year (Figure 7).

	N	Percent (%)
Tested for HIV	20	5.5
Not tested for HIV	346	94.5
Total	366	100

Table 5: The number and the percentage of participants who had been tested for HIV and those who had not been tested

Reasons for not being tested for HIV	N	Percentage (%)
It's unlikely you've been exposed to HIV.	162	47.6
Fear of the consequences of a positive result	7	2.1
You were worried your name would be reported to the government if you tested positive.	3	0.9
You don't trust the results to be confidential.	1	0.3
No one had offered you an HIV test.	121	35.6
You were afraid of losing friends and family if people knew you were HIV positive.	6	1.8
You were afraid of being discriminated against and stigmatized.	3	0.9
You didn't know where to get tested.	16	4.7
You need to travel for a long distance to get tested.	1	0.3
Fear of needles.	4	1.2
Other reason	16	4.7
Total	340	100

Table 6: The main reasons selected by the participants who had not been tested for HIV

Reasons for getting tested for HIV	N	Percentage
Mandatory pre-marital test.	5	25
Worried that you may have been infected.	2	10
Because you practised unprotected sex.	2	10

Because a doctor, nurse or other health care professional asked you to.	2	10
For hospitalization or a surgical procedure.	2	10
For employment purposes.	2	10
Other reason	5	25
Total	20	100

Table 7: The main reasons selected by the participants who had been tested for HIV

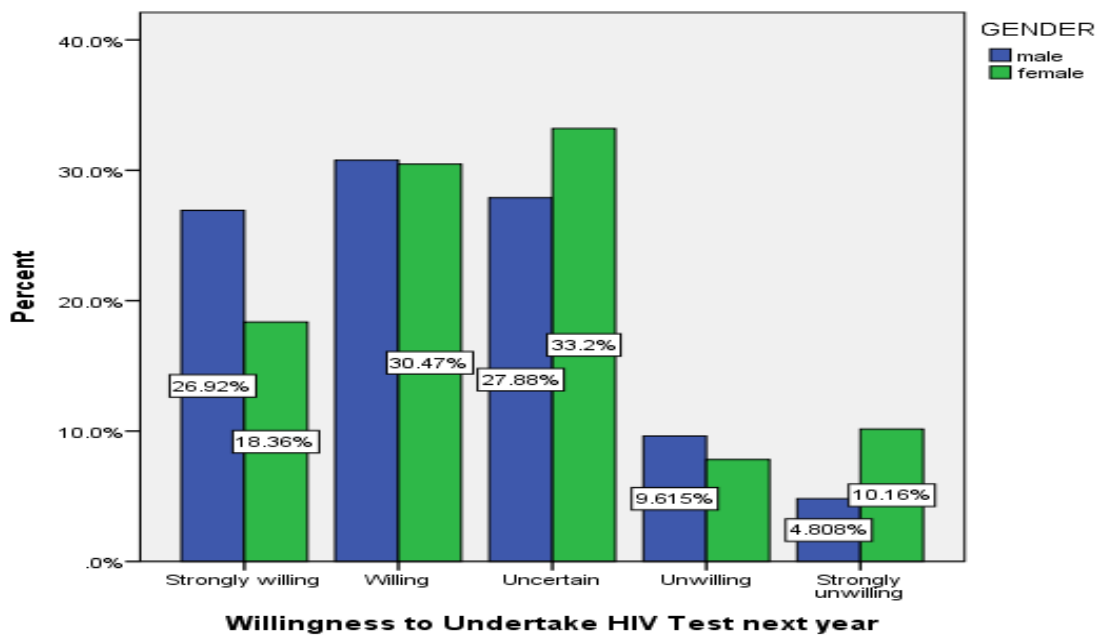


Figure 7: The participants' willingness to undertake the HIV test next year

5.2.3 Risk perception score

The perception of risk was assessed using three statements rated on a five-point Likert scale to determine how the participants perceived their level of risk of contracting HIV. A high score indicated that a participant perceived him/herself among the high risk group in terms of contracting HIV. The risk perception score ranged from 3 to 15 and the mean risk perception score was 10.9 with a standard deviation of 2.5 (Table 8). The scores of nearly half of the participants (49.2 percent) ranged between 8 and 11 whereas those who scored 12 or above represented 41.8 percent. In addition, only 9 percent of the participants' scores were under 8 (Figure 8). The mean score of the male participants was 11.7, with a

standard deviation of 2.5, whereas the mean score of the female participants was 10.5, with a standard deviation of 2.4 (Table 9).

❖ *The risk perception score and the differences across genders and age groups*

The differences between males and females in the mean scores concerning risk perception were assessed by employing two steps. The first of these steps was to calculate the score and create a new variable named “Total perception score”; the other step was to check whether or not the new variable met the assumptions required for the parametric test. As a result, several investigations, such as normality and equality of variance testing, were undertaken. These tests revealed that it was appropriate to apply the parametric test on the risk perception variable in order to assess the difference between the mean scores of the male and female participants. Therefore, the independent samples t-test was selected (Table 10) and this test concluded that there was a statistically significant difference in the mean scores regarding the risk perception of male and female participants: $t(366) = 4.037$, the p-value was less than the significant level (0.05). The magnitude of the difference in the means (mean difference = 1.2), 95% *CI* (0.59 to 1.71) was small (eta squared = 0.04) (Table 10).

The descriptive statistics in Table 11 show a clear difference in the mean scores of HIV risk perception across the three age groups. In addition, the assessment of the differences in the mean scores in the risk perception scale across age groups was performed by applying a one-way ANOVA test. The one-way ANOVA showed that there were statistically significant differences in the mean risk perception scores across the age groups (Table 12). The mean score of Group 1 ($M=10.26$, $SD=2.66$) differed significantly from the other two groups. However, the difference between Group 2 and 3 was not statistically significant (Table 13).

	N	Minimum	Maximum	Mean	St. Deviation
Total Perception Score	368	3	15	10.85	2.53

Table 8: The risk perception score - descriptive statistics

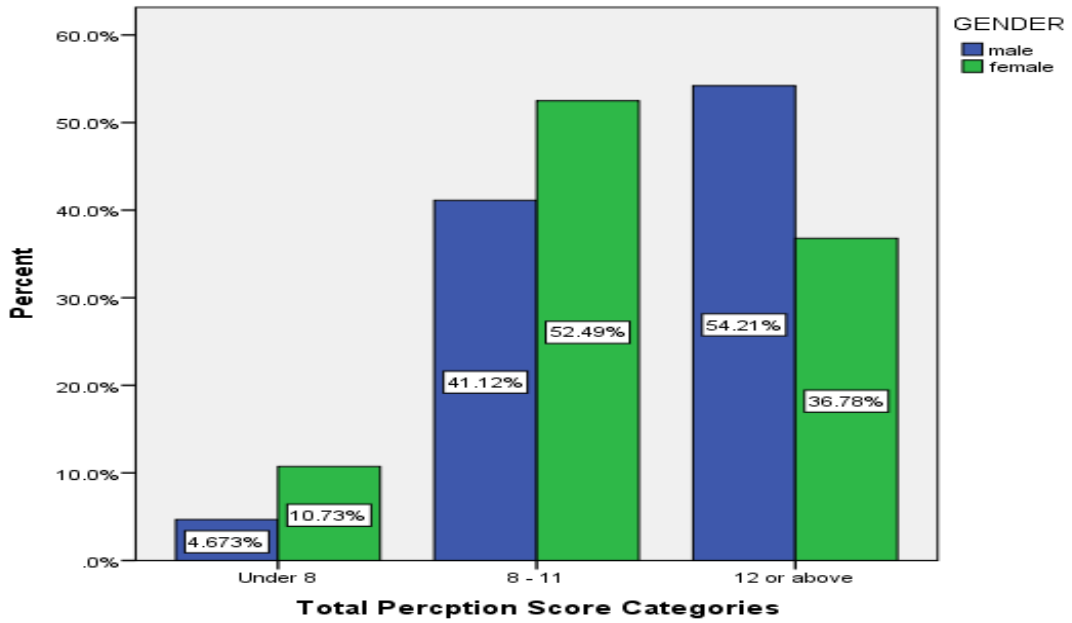


Figure 8: The participants' risk perception score percentages across genders

	Gender	N	Mean	St. Deviation	St. Error mean
Total Perception Score	Male	107	11.67	2.52	0.24
	Female	261	10.52	2.47	0.15

Table 9: The risk perception score - descriptive statistics across genders

Total Perception Score	Levene's Test		T-test				
	F	Sig.	t	df	Sig.	Mean Difference	95% CI
	0.014	0.906	4.037	366	0.000	1.151	(0.59 – 1.71)

Table 10: The result of the t-test to determine whether there was a significant difference in the mean risk perception score across genders

Age groups	Numbers	Means (M)	Standard deviation (SD)	
Group 1	17-19	125	10.26	2.66
Group 2	20-22	188	11.11	2.35
Group 3	23-25	55	11.35	2.65
Total		368	10.86	2.54

Table 11: The risk perception score mean scores and standard deviations for the three age groups

	Sum of Squares	df	Mean square	F	Sig
Between groups	68.77	2	34.385	5.474	0.005
Within groups	2292.59	365	6.281		
Total	2361.37	367			

Table 12: The result of the ANOVA test which shows statistically significant differences across the age groups

Age group	Sig.	95 % confidence interval		
		Lower	upper	
17-19	20-22	.011	-1.54	-0.15
	23-25	.024	-2.06	-0.11
20-22	17-19	.011	0.15	1.54
	23-25	1	-1.16	0.69
23-25	17-19	.024	0.11	2.06
	20-22	1	-0.69	1.16

Table 13: Showing specifically which of the three groups' mean scores significantly differed from others

5.2.4 HIV/AIDS related knowledge

The HIV/AIDS related knowledge section consisted of twelve statements and the participants were asked to determine whether these statements were correct or not. The twelve statements attempted to assess the participants' awareness of routes of HIV/AIDS transmission, its severity, preventive measures, and HIV/AIDS mortality in Saudi Arabia. The responses showed that misconceptions about HIV/AIDS were apparent in the

responses of the respondents. The following table shows the number of participants who responded correctly and those who responded incorrectly to each statement (Table 14).

No.	statement	Correct N (%)	Incorrect N (%)
1	A person can be infected with HIV and not show signs of disease for many years	265 (70.3)	112 (31.6)
2	A person can get HIV by sharing a meal with someone who has HIV	258 (68.4)	119 (31.6)
3	Once infected with HIV, a person can potentially infect others for the rest of his or her life	204 (54.1)	173 (45.9)
4	All pregnant women infected with HIV will pass it onto their baby	100 (26.5)	277 (73.5)
5	People who have been infected with HIV quickly show serious physical signs of being infected	214 (56.8)	163 (43.2)
6	There is a vaccine that can stop adults from getting HIV	167 (44.3)	210 (55.7)
7	A person can become infected with HIV by having unprotected sexual intercourse	338 (89.7)	39 (10.3)
8	Mosquitoes bites could transmit HIV	143 (37.9)	234 (62.1)
9	A person will not get HIV if he/she is taking antibiotics	226 (59.9.6)	151 (40.1)
10	AIDS-related illnesses are the leading causes of death among 18-25 years old in Saudi Arabia	102 (27.1)	275 (72.9)
11	Taking a test for HIV one week after the exposure to HIV virus should tell a person if he/she has HIV or not	88 (23.3)	289 (76.7)
12	HIV can be cured if diagnosed early	99 (26.3)	279 (73.7)

Table 14: The number and percentages of participants' responses to HIV/AIDS knowledge questions

The HIV/AIDS related knowledge score was obtained by computing the sum of the correct answers given by each participant to a set of twelve true and false questions. Each correct answer was accorded one point while an incorrect answer was given zero. The incorrect answers included both wrong answers and "I do not know". Therefore, the

HIV/AIDS related knowledge scores ranged from 0 to 12 points while the mean score was 5.9 with a standard deviation of 2.5 (Table 15). The scores of 150 participants were between 5 and 7, representing about 40 percent of the total number of the participants who responded to the HIV/AIDS related knowledge questions (Figure 9). In addition, 118 participants scored under five points which represented 31.6 percent whereas 105 participants scored 8 points or above; this represented 28.2 percent (Figure 9). The male participants' mean score was 6.4, with a standard deviation of 2.4, while the female participants' mean score was 5.7, with a standard deviation of 2.5

(Table 16).

❖ *HIV/AIDS related knowledge score and the differences across gender and age groups*

In order to determine whether there was a difference between the performance of male and female participants in terms of HIV/AIDS related knowledge, the scores were obtained and a new variable was created. The new variable was assessed to verify its eligibility to perform certain parametric tests, such as a t-test. Four main assumptions need to be assessed (this applies for all parametric tests) and the first is that the dependant variable should be a continuous scale which applies in the case of the HIV/AIDS related knowledge score. The second assumption is that the sampling technique used to collect the data are a probability sampling approach; in other words, that the sample has been drawn randomly from the population. The technique employed in this study was actually a non-probability sampling technique; however, although the random sampling assumption was violated, this is less serious. In terms of the assumption regarding independency of observation, this was clearly met in the study as each participant completed the online questionnaire separately and there was no apparent influence which might have affected the participants' responses. The normality assumption was assessed by plotting the scores on a histogram, comparing the mean and the 5 percent trimmed

mean, and then testing the normality using the Kolmogorov-Smirnov test. The HIV/AIDS related knowledge score appeared to be reasonably normally distributed. The final assumption concerns homogeneity of variance or equality of variance. This was assessed by employing Levene's test which revealed that both groups were equal (Table 17). Thus, the independent sample t-test was selected to determine whether there was a significant difference in the mean HIV/AIDS related knowledge score across the genders (Table 17). The t-test result concluded that there was no statistically significant difference in the HIV/AIDS related knowledge mean scores for males and females: $t(375) = 1.62, p = 0.107$. The magnitude of the difference in the means, however, (mean difference = 0.5, 95% *CI* (-0.1 to 1.04) was small (eta squared = 0.02) (Table 17).

In terms of the mean difference between the three age groups, a one-way ANOVA was applied to determine whether there were significant differences in the mean HIV/AIDS related knowledge score across the age groups. In addition, a post-hoc test was used to identify where these differences lay if they existed. The descriptive statistics in Table 18 show a clear difference in the mean scores of HIV/AIDS related knowledge across the three age groups while the one-way ANOVA revealed statistically significant differences in the mean HIV knowledge scores across the age groups (Table 19). The mean score of Group 1 ($M=4.92, SD=2.17$) differed significantly from the other two groups. However, the difference between Group 2 and 3 was not statistically significant (Table 20).

	N	Minimum	Maximum	Mean	St. Deviation
Knowledge Score	377	0	12	5.85	2.59

Table 15: The HIV/AIDS related knowledge score - descriptive statistics

	Gender	N	Mean	St. Deviation	St. Error mean
Knowledge Score	Male	112	6.18	2.71	0.26
	Female	265	5.71	2.55	0.16

Table 16: The HIV/AIDS related knowledge score - descriptive statistics across genders

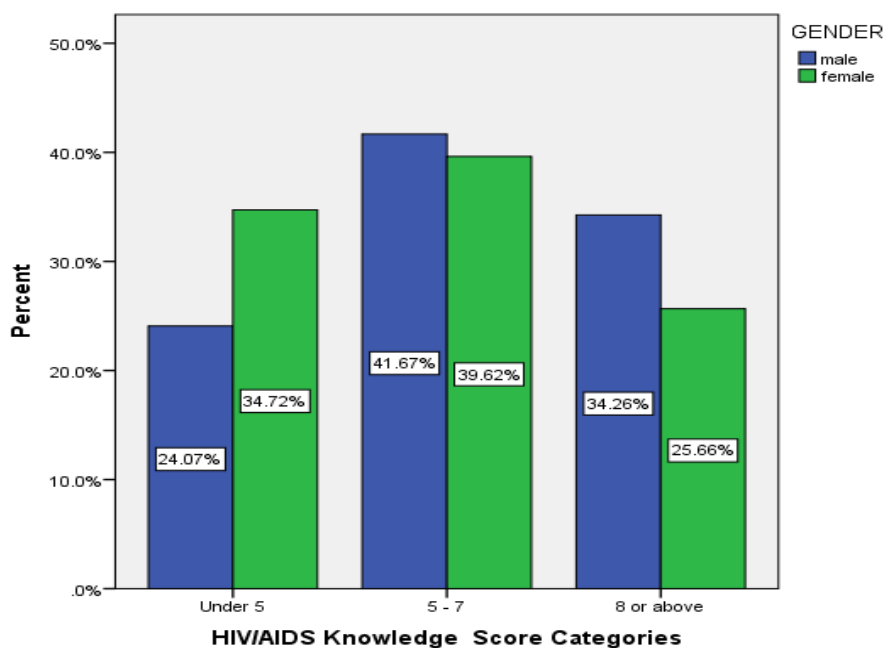


Figure 9: The participants' HIV/AIDS related knowledge score percentages across genders

Knowledge Score	Levene's Test		T-test				
	F	Sig.	t	df	Sig.	Mean Difference	95% CI
	0.191	0.66	1.618	375	0.107	0.47	(-0.10 – 1.04)

Table 17: The results of the t-test to determine whether there was a significant difference in the mean HIV/AIDS related knowledge score across genders

Age groups	Numbers	Means (M)	Standard deviation (SD)
Group 1	17-19	128	4.92
Group 2	20-22	193	6.17
Group 3	23-25	56	6.86
Total		377	5.85

Table 18: The HIV/AIDS related knowledge mean scores and standard deviations for the three age groups

	Sum of Squares	df	Mean square	F	Sig.
Between groups	186.307	2	93.153	14.795	0.00
Within groups	2354.770	374	6.296		
Total	2541.077	376			

Table 19: The result of the ANOVA test which shows statistically significant differences across the age groups

Age group		Sig.	95 % confidence interval	
			Lower	upper
17-19	20-22	.000	-1.93	-0.56
	23-25	.000	-2.90	-0.97
20-22	17-19	.000	0.56	1.93
	23-25	0.211	-1.61	0.224
23-25	17-19	.000	0.97	2.90
	20-22	0.211	-0.224	1.61

Table 20: Showing specifically which of the three groups' mean scores significantly differed from the others

5.2.5 Attitude toward HIV testing score

This part of the questionnaire included 37 statements which were rated by the participants on a five-point Likert rating scale. Thirteen statements were denoted as facilitators to undertake an HIV test. On the other hand, twenty-four statements were denoted as barriers to undertake such a test. The 37 statements represented six categories, namely: confidentiality, relationship matters, fears, beliefs, trust, and the testing process. In addition, each category consisted of a number of statements so the participants' responses to the 37 statements are presented and discussed in relation to the six categories.

A. Confidentiality

Two statements were designated to assess whether confidentiality was perceived by the participants as an important element of HIV testing services. In addition, one statement sought to reveal what the participants thought about the confidentiality of the HIV testing

services (Table 13). The participants' responses show that 53.4 percent of the participants doubted the confidentiality of HIV testing. The responses demonstrate clearly that confidentiality is crucial for HIV testing as 57.5 percent of the participants claimed that they did not want anyone to know that they had taken an HIV test. Also, about 40 percent asserted that they would be distressed if the HIV test that they had taken had been made public to anyone they knew (Table 21).

Statements	Strongly agree N (%)	Agree N (%)	Neither agree nor disagree N (%)	Disagree N (%)	Strongly disagree N (%)
	1	2	3	4	5
HIV testing is not really confidential	17 (5.2)	67 (20.4)	177 (53.4)	42 (12.8)	26 (7.9)
I would not want anyone to know if I got an HIV test	99 (30.1)	90 (27.4)	88 (26.7)	36 (10.9)	16 (4.9)
It would not bother me if someone I know sees me going to get an HIV test (Reversed)	32 (9.7)	85 (25.8)	82 (24.9)	89 (27.1)	41 (12.5)

Table 21: Confidentiality

B. Relationship matters

The relationship section in the attitude toward HIV testing was divided into two sub-categories: family and friends. Under each sub-category, a number of statements were designed to estimate how the participants perceived the role of their family and friends in their decision to undertake an HIV test. Some of these statements considered the reaction of family and friends to a decision or action to undergo HIV testing as perceived by the participants. The participants' responses showed that 50.2 percent and 35.9 percent of the participants seemed uncertain whether their friends and families would support them if they decided to undergo the HIV test. In term of discussing HIV testing with family, about 49 percent of the participants demonstrated difficulties in discussing such a topic with family. However, they appeared uncertain about turning to friends as 33 percent could not talk or discuss medical decisions with their friends, 35 percent could do this and 32

percent were uncertain. In addition, nearly half of the participants indicated that their decision to undertake an HIV test would upset their parents whereas 33.7, 39.2 and 36.2 percent were unsure whether their decision to be tested or their actual testing would affect how their friends treated them (Table 22).

Sub-Category	Statements	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
		N (%)	N (%)	N (%)	N (%)	N (%)
		1	2	3	4	5
Family	My family would support me if I decided to be tested for HIV (Reversed)	45 (13.7)	68 (20.7)	118 (35.9)	53 (16.1)	45 (13.7)
	My parents would be upset if they knew I was planning to get tested for HIV	63 (19.1)	99 (30.1)	94 (28.6)	49 (14.9)	24 (7.3)
	I could easily discuss HIV testing with my family (Reversed)	18 (5.5)	61 (18.5)	90 (27.4)	89 (27.1)	71 (21.6)
Friends	My friends would not look down on me if I were tested for HIV (Reversed)	33 (10)	86 (26.1)	111 (33.7)	74 (22.5)	25 (7.6)
	My friends would support my decision to get an HIV test (Reversed)	20 (6.1)	69 (21)	165 (50.2)	59 (17.9)	16 (4.9)
	I can talk to my friends about making medical decisions (Reversed)	30 (9.1)	87 (26.4)	104 (31.6)	70 (21.3)	38 (11.6)
	My friends would look down on me if I were tested for HIV	25 (7.6)	64 (19.5)	129 (39.2)	71 (21.6)	40 (12.2)
	My friends would not treat me any differently if I was tested for HIV (Reversed)	31 (9.4)	97 (29.5)	119 (36.2)	63 (19.1)	19 (5.8)
	I would be embarrassed if my friends found out I had decided to have an HIV test	26 (7.9)	67 (20.4)	97 (29.5)	87 (24.4)	52 (15.8)

Table 22: Relationship matters

C. Fears

Various types of fear related to HIV testing were discussed in the literature and so eight statements were included in the attitude toward HIV testing scale. The types of fear that were integrated into the attitude toward HIV testing scale included fear of: stigma, a positive result, employers' discrimination, breach of privacy, needle injection, legislation,

and scandal. The results showed that 50.2 percent of the respondents considered a positive HIV test would lead them to be stigmatised. In addition, 48 percent of the respondents negated the impact of positive results on their decision to undertake an HIV test. In terms of employers' responses to positive HIV test results, 43.8 percent of the respondents seemed unsure whether this would affect their employment or not. The responses also revealed that the type of questions that an individual might be asked when he/she is being tested for HIV did not affect his/her testing decision as 42.8 percent of the respondents denied any relation between their testing intention and the overly personal questions which might be asked. It was also evident that fear of a needle injection affected only a minority of the participants as 70.5 percent of the respondents denied having this type of fear and said it had no impact on their testing decision (Table 23).

Statements	Strongly agree N (%)	Agree N (%)	Neither agree nor disagree N (%)	Disagree N (%)	Strongly disagree N (%)
	1	2	3	4	5
People who test positive will be stigmatized by the community	67 (20.4)	98 (29.8)	66 (20.1)	49 (14.9)	49 (14.9)
I would not consider getting an HIV test because I would be asked about things I have done that could get me into trouble	44 (13.4)	65 (19.8)	98 (29.8)	71 (21.6)	51 (15.5)
I would not get tested for HIV because I would be asked information that was too personal	33 (10)	64 (19.5)	91 (27.7)	87 (26.4)	54 (16.4)
I would not get tested for HIV because I am afraid of the consequences of a positive result	28 (8.5)	38 (11.6)	105 (31.9)	86 (26.1)	72 (21.9)
I would not consider getting an HIV test because people who test positive would be treated differently by employers	43 (13.1)	80 (24.3)	144 (43.8)	43 (13.1)	19 (5.8)
I would not consider getting an HIV test because I am afraid of needles	12 (3.6)	17 (5.2)	68 (20.7)	105 (31.9)	127 (38.6)
I am afraid that if I were tested for HIV my name would go into public records	49 (14.9)	69 (21)	103 (31.3)	75 (22.8)	33 (10)

I am afraid someone would find out I was tested for HIV	37 (11.2)	79 (24)	105 (31.9)	72 (21.9)	36 (10.9)
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Table 23: Fears

D. Beliefs

The uptake of the HIV test was influenced by how people thought and what beliefs they held. Accordingly, nine statements in the attitude toward HIV testing scale were devoted to ascertain the effect of certain beliefs and assumptions related to HIV testing. The beliefs and assumptions that were being assessed related to how people would judge anyone undertaking an HIV test, how they think others would judge them if they were tested for HIV, how they perceived their risk of contracting HIV, and how they perceived HIV health care services, including HIV testing. In response to the statement which stated that anyone tested for HIV is disgusting, 83.5 percent of the respondents disagreed. On the other hand, in response to two different statements that demonstrated people's judgements about anyone as infected if he/she was only tested for HIV, 69.6 and 58.1 percent of the respondents agreed with this statement. In terms of whether the availability of HIV health services would persuade them to undertake an HIV test and whether the HIV test gave accurate results, the majority of the respondents (58.4 percent) appeared to be uncertain. The majority of the respondents (59 percent) also seemed to perceive their behaviours to be very low risk in terms of them contracting HIV. In addition, about 40 percent believed that testing for HIV led to peace of mind (Table 24).

Statements	Strongly agree N (%)	Agree N (%)	Neither agree nor disagree N (%)	Disagree N (%)	Strongly disagree N (%)
	1	2	3	4	5
Anyone who is tested for HIV is disgusting	8 (2.4)	5 (1)	41 (8.2)	62 (18.8)	213 (64.7)
People assume that everyone who is tested for HIV is infected with HIV	64 (19.5)	127 (38.6)	59 (17.9)	39 (11.9)	40 (12.2)
Admitting that you should be tested for HIV means that you have engaged in immoral behaviour	49 (14.9)	70 (21.3)	59 (17.9)	58 (17.6)	93 (28.3)

HIV tests give accurate results (Reversed)	28 (8.5)	96 (29.2)	192 (58.4)	10 (3)	3 (0.9)
It would be embarrassing to get tested for HIV	38 (11.6)	78 (23.7)	90 (18)	80 (24.3)	43 (13.1)
People would assume I have HIV if I decided to get tested	88 (26.7)	141 (42.9)	68 (20.7)	19 (5.8)	13 (4)
Availability and accessibility of HIV related health care services encourages me to get an HIV test (Reversed)	16 (4.9)	45 (13.7)	192 (58.4)	51 (15.5)	25 (7.6)
I would get an HIV test because it would put my mind at rest (Reversed)	47 (14.3)	84 (25.5)	135 (41)	46 (14)	17 (5.2)
I would not consider getting an HIV test because my behaviour puts me at a very low risk	118 (35.9)	76 (23.1)	93 (28.3)	22 (6.7)	20 (6.1)

Table 24: Beliefs

E. Trust

The nature and the strength of the relationship between the health care providers and the service users is also likely to affect the HIV test uptake. Trusting health care providers is not restricted to how they treat and deal with individuals; however, it does extend to how health care providers handle the information. For example, 54.7 percent of the respondents believed that their HIV test information would be handled in very confidential manner by the medical staff. In addition, 42.5 percent of the respondents trusted the HIV counsellors and nurses to keep their information confidential. Moreover, about 57 percent of the respondents expressed the view that talking to an HIV counsellor about personal issues might help an individual at a high risk of contracting the HIV infection. The majority of the respondents (73.3 percent) appeared to be uncertain about the effect of the attitude of HIV testing centre staff towards service users on their HIV testing decision (Table 25).

Statements	Strongly agree N (%)	Agree N (%)	Neither agree nor disagree N (%)	Disagree N (%)	Strongly disagree N (%)
	1	2	3	4	5
HIV test information is kept very confidential by medical staff (Reversed)	63 (19.1)	117 (35.6)	118 (35.9)	24 (7.3)	7 (2.1)
I would be comfortable talking to an HIV counsellor about personal behaviours that place me at risk of HIV infection (Reversed)	63 (19.1)	124 (37.7)	92 (28)	34 (10.3)	16 (4.9)
I trust the HIV test counsellors and nurses to keep my information confidential (Reversed)	52 (15.8)	88 (26.7)	119 (36.2)	54 (16.4)	16 (4.9)
The way staff at HIV testing centres treat people when they get tested puts me off having an HIV test	18 (5.5)	19 (5.8)	241 (73.3)	32 (9.7)	19 (5.8)

Table 25: Trust

F. Testing process

Four statements were included in the attitude toward HIV testing scale to denote the HIV testing process and logistics that might affect the utilisation of the test. The responses showed that the majority of the respondents (about 70 percent) appeared unaware of the locations of testing centres. It was also clear that 51.1 percent of the respondents considered free HIV tests as an encouragement to HIV testing. In addition, it was also evident that the waiting time before obtaining the test result did not influence the testing decision as 52 percent of the respondents confirmed this (Table 26).

Statements	Strongly agree N (%)	Agree N (%)	Neither agree nor disagree N (%)	Disagree N (%)	Strongly disagree N (%)
	1	2	3	4	5
I do not have time to get an HIV test	36 (10.9)	74 (22.5)	122 (37.1)	68 (20.7)	29 (8.8)
I would not go for an HIV test if I had to wait more than a day for the results	15 (4.6)	36 (10.9)	107 (32.5)	98 (29.8)	73 (22.2)
I do not know where I can get tested	107 (32.5)	123 (37.4)	51 (15.5)	27 (8.2)	21 (6.4)

I would get an HIV test if it was free	74 (22.5)	94 (28.6)	110 (33.4)	41 (12.5)	10 (3)
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Table 26: Testing process

A score for each participant's attitude towards HIV testing was computed by adding the score for each of the rated statements. Thus, a high score signifies that the participant has a more favourable attitude towards HIV testing than those who attain a low score. The mean score of the attitude towards HIV testing was 110.4 with a standard deviation of 17.5 (Table 27). In addition, the maximum score achieved was 163 while the minimum score was 63. Three hundred and twenty nine participants completed this part of the questionnaire; this represented the number who completed the whole questionnaire. Two hundred and thirty four of those who completed this part of the questionnaire were female participants and their mean score was 111.3 with a standard deviation of 17.3 (Table 10). In contrast, 92 of the respondents were male and their mean score was 108 with a standard deviation of 17.9 (Table 28).

A score concerning the attitude towards HIV testing was also computed separately for the statements which represented barriers to HIV testing. Twenty-four statement responses were included in calculating sub-scores which were generated using a variable option on SPSS software. The mean for the HIV testing barriers' sub-score was 65.8 with a standard deviation of 12.6. The mean sub-score (barriers) for female participants was 67.1, with a standard deviation of 12.1, while the mean sub-score (barriers) for male participants was 62.7, with a standard deviation of 13.4. Another sub-score was generated by adding the response value of the 13 statements which represented HIV testing facilitators. The mean of the HIV testing facilitators' sub-score was 44.6 with a standard deviation of 7.1. In addition, the mean sub-score (facilitators) for female participants was 67.1, with a standard deviation of 12.1, and the mean sub-score (facilitators) for male participants was 62.7, with a standard deviation of 13.4.

❖ *Attitude toward HIV testing score and the differences across genders and age groups*

In assessing the existence of a statistical difference between male and female participants in terms of their attitude towards HIV testing, a process similar to that carried out for the HIV/AIDS related knowledge score and the risk perception score was undertaken. A score was computed by adding the value of the responses to the 37 statements and a new variable was created named “Attitude Score”. The parametric test assumptions were also checked for the new variable and these indicated that there were no clear or serious violations to suggest these tests should not be applied. Therefore, the independent sample t-test was used and showed no statistically significant differences in the scores with regard to attitudes towards HIV testing between male and female participants: $t(327) = -1.75$; the p-value was 0.082 which is more than the significant level (0.05). The magnitude of the difference in the means (mean difference = -3.8), 95% *CI* (-8.06 to 0.48) was very small (eta squared = 0.006) (Table 29).

Despite the prominent differences in the mean scores across age groups, Group 1 (M=110.99, SD=15.43), Group 2 (M=111.73, SD=18.70) and Group 3 (M=116.16, SD=20.22), the difference was statistically non-significant (p-value > 0.05). This result was obtained by employing the one-way ANOVA statistical test to assess the mean differences across the three age groups (Table 30).

	N	Minimum	Maximum	Mean	St. Deviation
Attitude Score	329	63	163	110.41	17.53

Table 27: The attitude toward HIV testing score - descriptive statistics

	Gender	N	Mean	St. Deviation	St. Error mean
Attitude Score	Male	95	108.15	17.96	1.84
	Female	234	111.33	17.31	1.13

Table 28: The attitude toward HIV testing score - descriptive statistics across genders

Attitude Score	Levene's Test		T-test				
	F	Sig.	t	df	Sig.	Mean Difference	95% CI
	0.188	0.665	- 1.75	327	0.082	- 3.8	(- 8.06 to 0.48)

Table 29: The result of the t-test to determine whether there was a significant difference in the mean attitude toward HIV testing across genders

	Sum of Squares	df	Mean square	F	Sig
Between groups	985.72	2	492.862 319.896	1.541	0.216
Within groups	104258.98	326			
Total	105271.70	328			

Table 30: The result of the ANOVA test which shows statistically insignificant differences across age groups

5.2.6 Exploring relationships

The questionnaire was divided into three main scales and each one was considered to be one of the factors that determined the uptake of HIV testing by young people in Saudi Arabia. The aim of the study required a multi-dimensional instrument in order to explore the factors from all known aspects. The relationships between the three scales scores, namely, HIV/AIDS related knowledge scores, risk perception scores, and attitude toward HIV testing scores, were all assessed. In addition, the relationships between the single item which determined a participant's willingness to undertake the HIV test and the three scales scores were also evaluated.

Correlational statistical analysis was used to determine whether or not an association between these scores existed. In addition, the analysis also determined the direction and the strength of the relationships. Non-parametric correlational statistical analysis and the Spearman Rank Order Correlation (ρ) were used. Only two statistical significant correlations were identified between the scale scores (Table 31). The correlational analysis showed weak positive correlations between the risk perception scores and the

HIV/AIDS related knowledge scores ($\rho = 0.224$, $n = 368$, $p < .001$). Thus, a high level of knowledge related to HIV/AIDS was associated with higher levels of risk perception (Table 31). In addition, another weak positive relationship was recognised between the attitudes towards HIV testing and a willingness to undertake the HIV test ($\rho = 0.237$, $n = 329$, $p < .001$). So, those who scored high on the attitude toward HIV testing scale were more willing to undertake the HIV test (Table 31).

Scale	Total perception score	Total attitude toward HIV testing score	Total HIV/AIDS related knowledge score	Willingness to undertake the HIV test score
Total perception score	-	0.016	0.224**	0.039
Total attitude toward HIV testing score		-	-0.096	0.237**
Total HIV/AIDS related knowledge score			-	0.006
Willingness to undertake the HIV test score				-

Table 31: Spearman Rank Order Correlations (ρ) between the four scales

** $p < .001$ (2-tailed)

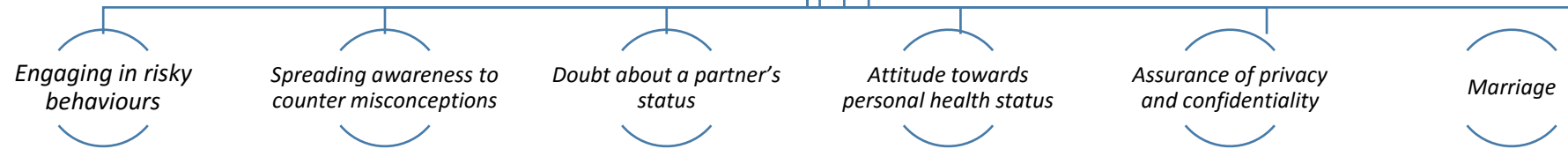
5.3 Qualitative strand findings

The second part of the study involves the interviews that were conducted with health care professionals working in the field of HIV/AIDS in Saudi Arabia. The aims of these interviews were to explain the quantitative results obtained from the university students and, in addition, to explore the factors that affected the utilisation of HIV testing by young people in Saudi Arabia from the point of view of health care professionals working in the field of HIV/AIDS. Three health care professionals were interviewed; all of them were doctors who had been working in the field for more than five years. Two of those interviewed were currently working in the National AIDS Program (NAP) in two different cities in the western province in Saudi Arabia. Each city in Saudi Arabia has at least one fully equipped centre which is part of NAP and these centres are responsible for all the HIV/AIDS activities in each city. The activities of NAP centres include running HIV/AIDS awareness campaigns, offering voluntary counselling and testing (VCT), and following up diagnosed individuals. One of the interviewees was an infectious disease consultant who is recognised in Saudi Arabia for his work in the field of HIV/AIDS; he is, however, not connected to the NAP working scheme. The interviews were conducted in the interviewees' offices at a time and date which was most convenient to them; the interviews lasted between 20 to 35 minutes. The interviewees were approached at least one week prior to the research interview. A study information sheet and a topic list that guided the interview were provided to the potential participants, as well as a consent form which was given out when they were recruited. The literature and the quantitative strand results influenced the interviews.

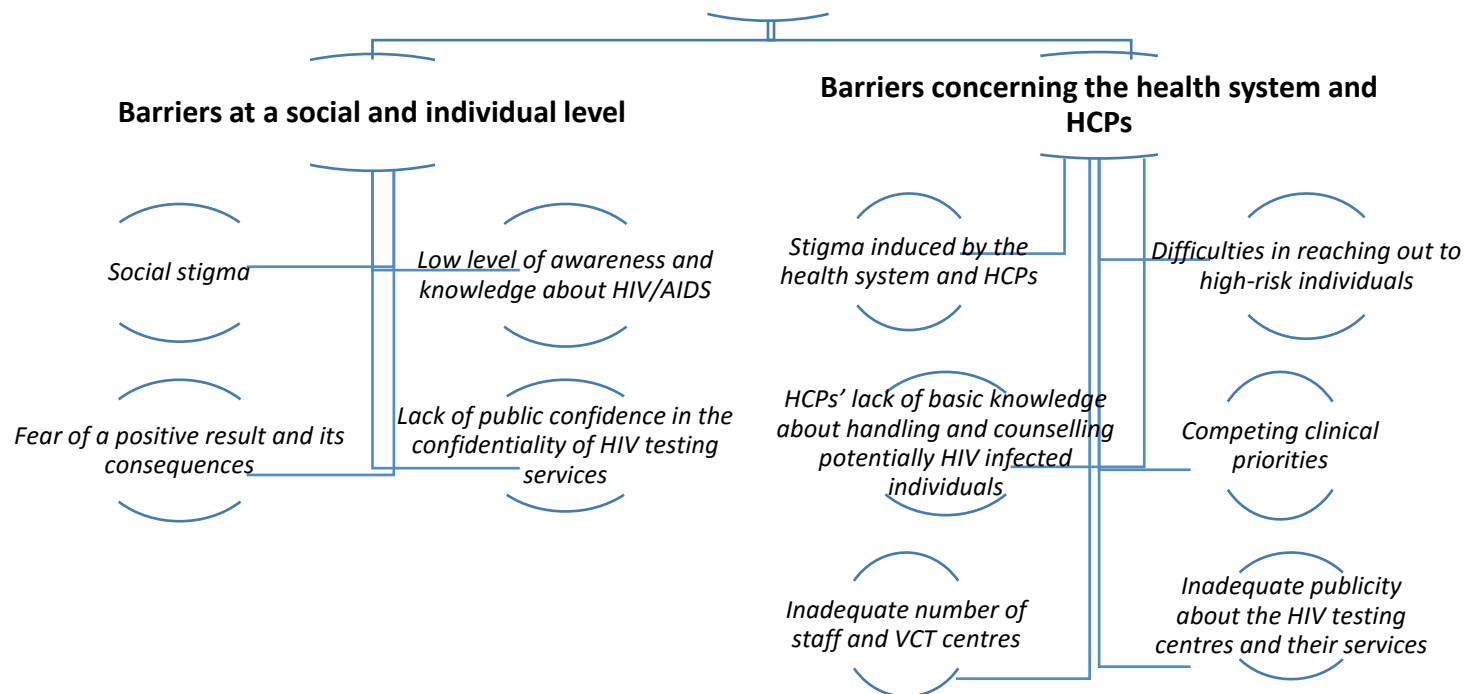
The interviews were digitally recorded and the Arabic language was mainly used during the interview; however, some participants occasionally used some English words or expressions. The interviews were transcribed verbatim and then translated into English. A deductive approach was adopted to analyse the data and thus, a list of initial themes

was generated. The data familiarisation process and the literature informed the initial thematic framework. Five main themes were identified and a number of sub-themes were also recognised under each theme. Although the initial themes were modified and refined, four main themes were retained as the final list, while some sub-themes were combined and some were abandoned. The final four main themes were as follows: HIV testing facilitators, HIV testing barriers, HIV/AIDS related knowledge, and an action plan to increase the uptake of HIV testing by young people in Saudi Arabia (Figure 10). The interview findings are presented and discussed in the chronological order in which they emerged during the interviews. A cross-match table showing the themes and participants' codes, together with the quotations, is provided in the appendix.

HIV testing facilitators



HIV testing barriers



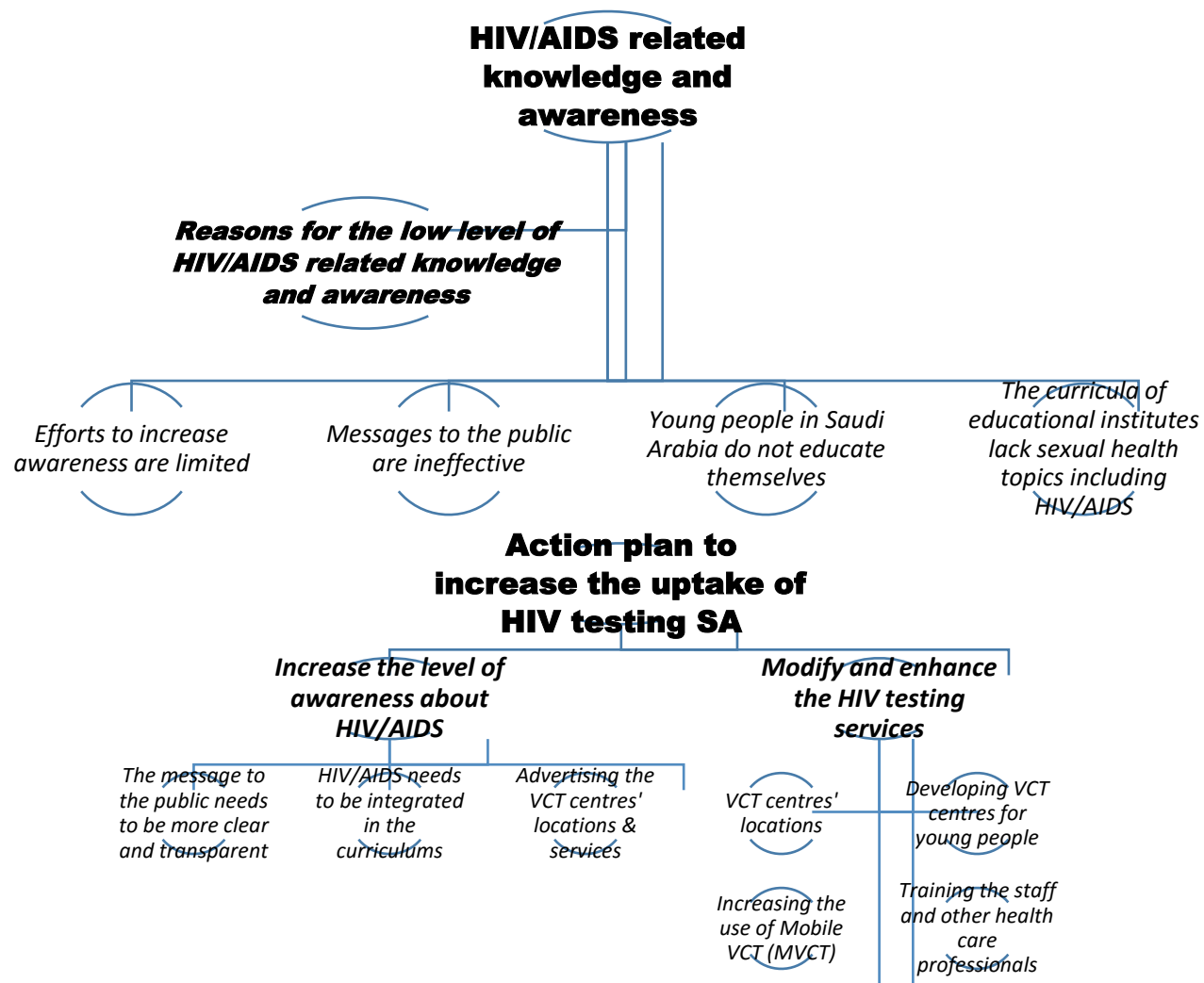


Figure 10: The qualitative findings theme

5.3.1 HIV testing facilitators

Despite the progress that has been made in the design and delivery of health care services, which have become more accessible and competent almost all over the world, there are always reasons which make individuals decide to use or reject the services. The facilitators are the motivators that encourage individuals to perform certain behaviours such as taking action, holding beliefs and perceiving benefits. In terms of HIV testing facilitators, these are what make an individual decide to step forward voluntarily in order to be tested for HIV; this not a simple course of action as the literature clearly demonstrated. The participants were asked about the facilitators that made young individuals come to take the HIV test in Saudi Arabia.

A. Engaging in risky behaviours

High risk behaviours are those that increase an individual's risk of contracting HIV if he/she performs one of those behaviours. Although the legislation in Saudi Arabia is derived from the Islamic religion which prohibits many HIV risky behaviours, such as sexual intercourse outside marriage and drugs (narcotics), occasionally these principles are disobeyed. One of the interviewees asserted that, in Saudi Arabia, individuals opted to undertake the HIV test if he/she had engaged in risky behaviour. The emotions of sorrow, guilt and fear the individual might feel after having performed certain behaviours made them come forward to undertake the test. As Interviewee (Ganp) explained:

“In SA people who come to get tested come because they have engaged in risky behaviour, especially sexual relationships so, they feel sorry, guilty and scared. Then, they decide to come to get tested.” (Ganp)

In addition, the strength of the desire, which developed following engagement in certain high risk activities, to know whether or not he/she was HIV positive also played a role in an individual's decision to undertake the test. Interviewee (Ganp) also added:

“I think the most important thing is the individual’s desire to ensure that he/she is not infected with HIV especially when he/she has engaged in any high risk activity.” (Ganp)

Engaging in risky behaviours was also mentioned by another interviewee (Wnap) as the most common reason that young males in Saudi Arabia indicated when they attended the testing clinic to get tested for HIV. Interviewee (Wnap) said:

“Commonly most of the young males who come to us at the VCT centre seeking our services are those who have travelled abroad and got involved in risky behaviour, especially sexual intercourse. So, I think generally getting involved in any risky behaviour will directly encourage people to come to the VCT centre and get tested for HIV.” (Wnap)

It seems that the fear of contracting HIV increases following an individual’s engagement in a high risk activity sequentially motivating the individual’s decision to undertake the test. It is also obvious that engaging in casual sexual intercourse was the main high risk activity that led to these concerns.

B. Spreading awareness to counter misconceptions

Knowing the correct information about HIV/AIDS risk factors also helps individuals in the process of making a decision about whether or not to undertake the test. Lack of awareness about how HIV is transmitted and what the high risk activities are tend to make an individual ignore the HIV test even though he/she might be at a high risk of contracting HIV. This is what Interviewee (Bnap) explained:

“An encouragement would be to spread awareness about what the disease is, how it’s transmitted, how it’s not transmitted. They could be at risk and they might not know it.” (Bnap)

Interviewee (Bnap) also added:

“Knowing the risk factors when we spread awareness of what are the risk factors and the high risk activities, people come forward and say, “Ok I want my HIV test done.” (Bnap)

An individual's awareness of the services which are available if the test reveals that he/she is HIV positive might also encourage him/her to opt for the test. Interviewee (Bnap) claimed:

“Letting them know that they have a right by telling them that there is treatment available and these are the resources available so, if you opt for them we will direct you in that direction.” (Bnap)

Spreading awareness of HIV/AIDS would increase the chance that an individual might decide to undertake the test. It is also important when spreading awareness about HIV to inform people about the services available and about their rights, such as the right to confidentiality.

C. Doubt about a partner's status

Sexual relationships outside marriage are prohibited in Islam. This is also deemed to be a criminal offence that could lead to a serious penalty, even reaching execution in certain circumstances, in Saudi Arabia. A number of married Saudi females have attended voluntary counselling and testing centres to get tested for HIV as they have suspected that their husbands might have engaged in an extra-marital sexual relationship and might thus be infected with HIV. This claim was clearly stated by Interviewee (Ganp):

“Most females come to us because their husbands had travelled a lot and they have suspicions that they were engaged in extra-marital sexual relationships so, they want to make sure that they are not infected with HIV.” (Ganp)

It is obvious that the motive here is doubt about a husband's sexual behaviour. Although extra-marital sexual relationships are illegal in Saudi Arabia, engaging in such activity is possible and legal in some countries.

D. Attitude towards personal health status

An individual's attitude toward his/her own health status in general will also determine how he/she reacts to HIV testing. In other words, the more an individual cares about

his/her health in general, the more likely he/she is to take proactive action to maintain his/her health status. One of the interviewees (Ganp) explained:

“How much the individual cares about his/her health in general since, the more a person cares about his/her health, the more he/she is willing to get tested and checked to assess his/her health status in general.” (Ganp)

It is also important to note that, if an individual is concerned about his/her health, then increasing awareness of what would be detrimental to health is essential for that individual to make a decision regarding preventive measures such as HIV testing. For example, if someone hears about HIV/AIDS risk factors, he/she might choose to take a step to know about his/her own HIV status. Interviewee (Bnap) recalled that a lot of individuals came to the VCT centre to take the HIV test following attendance at an HIV awareness activity:

“Taking the first step toward better health, that is one thing we have seen in the shopping malls when we advertise it, give brochures and tell them that you could be infected with HIV unless you do the test.” (Bnap)

E. Assurance of privacy and confidentiality

Although VCT centres in Saudi Arabia adopt an anonymous approach to their services, the public needs to be informed clearly that the VCT services are anonymous. The stigma and taboo related to HIV/AIDS are frequently cited as barriers that affect the utilisation of HIV health-related services. Thus, ensuring the privacy and confidentiality of the service would consequently motivate individuals to utilise those services. One of the interviewees (Bnap) highlighted the importance of reassuring the public that the VCT services are private and confidential:

“VCT helped a lot as when we advertise it we tell people, “You will be tested without giving any names or ID; it’s anonymous.” This makes them feel more comfortable, you know.” (Bnap)

Assuring the confidentiality and anonymity of the VCT services should be stated clearly in HIV awareness campaigns.

F. *Marriage*

In Saudi Arabia pre-marital testing is mandatory for both men and women who intend to get married. This compulsory test includes a number of medical laboratory screening tests and HIV is one of these tests. During the process of growing up, especially for males in Saudi Arabia, some of them in their early adulthood might engage in sexual relationships to explore their sexual abilities. Thus, when they decide to get married they seek the VCT centres for HIV testing prior to the mandatory HIV test. Interviewee (Ganp) claimed:

“From my experience many men get tested voluntarily before taking the pre-marital mandatory testing to make sure they are not infected. So, I think marriage could be a facilitator for men.” (Ganp)

In the pre-marital mandatory HIV testing, the results are disclosed to both of the couple and this sometimes makes an individual attempt to be tested for HIV voluntarily prior to the mandatory test.

5.3.2 HIV testing barriers

HIV testing barriers consist of anything that hinders individuals from utilising the HIV test at any level. Some of these barriers are related to the individual’s understanding, beliefs and perceptions about HIV/AIDS and his/her risk of contracting the infection. On the other hand, societal norms and beliefs are also considered to be influential in the uptake of HIV testing. In addition, the health care system and health care providers have their own issues that could be considered reasons for the low uptake of the HIV testing among young people in Saudi Arabia.

In the interviews the main focus was on the individual and social issues that hindered the uptake of HIV testing. In addition, some problems faced or were caused by the health system and health care professionals in Saudi Arabia. Therefore, two themes were

identified from the interviews and numbers of sub-themes were distinguished under each theme.

A. Barriers at a social and individual level

The presence of social pressures on individuals to act according to the societal norms and beliefs influences an individual's attitudes. However, certain issues, such as low levels of awareness, which individuals may encounter, make them choose to perform certain behaviours which are not related to these societal norms and beliefs. Various issues related to barriers at a social and individual level to HIV testing were discussed in the interviews with the health care professionals. Four sub-themes were identified, namely: social stigma, low levels of awareness and knowledge about HIV/AIDS, fear of the consequences of a positive result, and a lack of public confidence in the confidentiality of HIV testing services.

❖ Social stigma

Social stigma refers to the practice of disgracing and labelling an individual as a result of his/her behaviours, attitudes or illnesses; such behaviours are viewed as dishonourable by the community. Almost all HIV/AIDS preventive measures, including attempts to seek HIV testing, have been affected globally by social stigmatisation. In the radical conservative religious setting of Saudi Arabia, the social stigma attached to AIDS has been suggested as an important barrier preventing people from accepting HIV/AIDS health services in general. Interviewee (Bnap) asserted that the stigma attached to HIV/AIDS is the first barrier that makes people decide not to undertake the test.

“Stigma is the first factor that makes people choose not to get tested and keeps them back.” (Bnap)

Another interviewee, (Ganp), also adduced that this is the most important barrier:

“I think the most important barriers is the stigma related to HIV/AIDS. This is because HIV/AIDS until now in many places around the world, including Saudi Arabia, is stigmatised and people still think that whoever gets infected with HIV has engaged in immoral behaviour.” (Ganp)

The interviewee also explained that this stigma in Saudi Arabia is related to people’s assumption that HIV can only be contracted through sexual relationships which are prohibited by religion; therefore, people are reluctant to undertake the test.

“In Saudi Arabia HIV is also widely known to be transmitted through forbidden sexual relationships. Therefore, this perception about HIV/AIDS has caused the reluctance of young people to get tested for HIV.” (Ganp)

Interviewee (Wnap) also highlighted the distinctive influence of being stigmatised in Saudi Arabia:

“The stigma related to HIV/AIDS acts as an important barrier, especially in our society.” (Wnap)

The social stigma attached to HIV/AIDS in Saudi Arabia has contributed significantly to the low uptake of HIV testing. It is also clear that the conservative religious setting of the Kingdom plays an important role in developing the notion of being stigmatised in Saudi Arabia in particular.

❖ *Low level of awareness and knowledge about HIV/AIDS*

The lack of knowledge and awareness of HIV/AIDS appears to be a fundamental aspect of the behaviours and attitudes towards preventive measures that an individual might adopt. It was clear that the participants in the quantitative strand of the study had huge gaps in their knowledge about HIV/AIDS. One of the interviewees, (Bnap), felt that misconceptions about HIV/AIDS increased the fears of individuals, thus preventing them from being proactive and protecting themselves. (Bnap) explained:

“There is a lack of awareness about HIV/AIDS and a fear that there is no treatment or ‘cure’. Yes, there is a treatment, but only to keep your health good;

there is no cure. So, if I was diagnosed with HIV, what would happen to me? My future is over! Awareness. They don't know that it's a chronic infection like diabetes or hypertension and it can be managed. Awareness of this is very low; it is a fear related to stigma. That's what keeps them from backing away from testing in my opinion.” (Bnap)

The interviewee also highlighted that this low level of knowledge and awareness about HIV/AIDS is not limited to the disease itself; it also extends to the services that are available, such as VCT centres. This is also a barrier to utilising the HIV tests. (Bnap) added:

“In terms of knowledge related to HIV testing services: a lot of them don't know that VCT centres are there; they don't know they can go and get tested without ID.” (Bnap)

Additionally, the low level of knowledge and awareness about HIV/AIDS is not a marginal barrier to testing: it is a crucial one. As Interviewee (Ganp) asserted:

“The low level of HIV related knowledge also accounts for a big share of the low testing. As an individual, I think I am healthy and I don't have symptoms so why should I bother myself and go to get tested!” (Ganp)

The huge misconceptions about HIV/AIDS in Saudi Arabia have hampered the utilisation of HIV testing. This is what Interviewee (Wnap) stated:

“The lack of knowledge about HIV/AIDS and the huge misconceptions around HIV/AIDS are also common barriers in SA. For example, a lot of people till now think that HIV can only be transmitted through sexual intercourse.” (Wnap)

❖ Fear of a positive result and its consequences

Although some individuals might have a high level of knowledge about HIV/AIDS and the behaviours of these same individuals might place them at high risk of contracting HIV, the fears that they might be infected keeps them from being tested. Thinking about ‘‘what ifs’’ is what prevents individuals from taking a step forward to undertake an HIV test. This is what Interviewee (Bnap) described:

“If they find out that they are HIV positive then what will happen? Then their family will know, they will lose their jobs and what if they’re married? What if the wife or the husband wants to leave? What will their friends say and how they will act? They think they will be outcast and isolated.” (Bnap)

Interviewee (Ganp) also claimed that the fear of a positive result is one of the barriers to HIV testing in Saudi Arabia:

“The fear of positive results could also count as a barrier to getting tested for HIV.” (Ganp)

The negative consequences of being an HIV infected individual add a further burden on an individual’s decision to undertake the test. These consequences include the socioeconomic, medical and psychological impacts of HIV infection on an individual’s life.

❖ ***Lack of public confidence in the confidentiality of HIV testing services***

The VCT centres’ services are totally anonymous and confidential; however, mistrust of confidentiality and anonymity by the public is common and a lack of confidence in the confidentiality and anonymity of HIV testing affects the utilisation of HIV testing in Saudi Arabia. Interviewee (Wnap) claimed that to be the most common barrier to testing:

“I think the most common barrier is that people always think that the HIV test is not confidential.” (Wnap)

B. Barriers concerning the health system and health care professionals

There are barriers to HIV testing induced by the health care system itself and by its providers. In addition, there are also obstacles faced by the health care system and health care professionals in establishing and operating the HIV testing services in Saudi Arabia. In the interviews six sub-themes related to barriers concerning the health system and health care professionals were identified. These six sub-themes were, namely: stigma induced by the health system and health care professionals, difficulties in reaching out to

high-risk individuals, health care professionals' lack of basic knowledge about how to handle and counsel a suspected HIV individual, competing clinical priorities, an inadequate number of staff and VCT centres, and poor publicity about the HIV testing centres and their services. Findings with regard to each sub-theme are discussed and presented separately below.

❖ *Stigma induced by the health system and health care professionals*

Disgracing an individual because he/she has been diagnosed with HIV is a common attitude from the public that those infected with HIV experience in their lives. However, the health care system and health care professionals are also affected by such stigmatisation. Some health care professionals avoid dealing with HIV patients or they scorn them. In addition, the health care system in Saudi Arabia also plays a role in inducing such stigma; for instance, the information about HIV/AIDS is implicit. The stigma induced by the health system and its professionals has contributed to the low uptake of the HIV test in Saudi Arabia. Interviewee (Bnap) highlighted that this stigma is sometime prompted by the health care professionals in Saudi Arabia. She said:

“Make it confidential because you don't want to spread the rumour about because there are some doctors who don't want to treat or deal with HIV cases as there is a stigma from the health care facilities, all right!! There may be discrimination in how they deal with this patient; the respect level goes down, the care taken goes down.” (Bnap)

This stigma may result in HIV patients being discriminated against and therefore this increases the social stigma attached to HIV which, in turn, has an impact on the attitudes of individuals toward HIV testing. This interviewee also criticised the government's publicity about HIV as it has prompted a rise in the level of stigmatisation attached to HIV.

“Then, again you see how much the country wants to talk about HIV, how much you want to disclose it” (Bnap)

The approach that some health care professionals have adopted in engaging with HIV preventive activity seems also to be stigmatised. For example, some physicians avoid talking about HIV to potential HIV infected individuals. As Interviewee (Wnap) said:

“I think also stigma has affected how health care workers deal with the disease. For instance, many physicians avoid talking about HIV/AIDS with their patients. They also don’t direct suspected individuals to us.” (Wnap)

❖ ***Difficulties in reaching out to high-risk individuals***

Access to HIV-related health services is enhanced in Saudi Arabia, as well as in other countries worldwide; however, reaching out to high-risk individuals is still a major challenge that keeps the uptake on testing low. The VCT centres depend on the proactive actions that HIV test seekers make and therefore opportunities to diagnose patients are often missed. This is what Interviewee (Bnap) explained:

“It is low because it’s difficult to reach out to people. Because we depend on our work circle which makes us wait for people to come to us and we wait for infected people to come to us so we can guide them toward the treatment centre and VCT centre.” (Bnap)

The outreach challenges are not confined to the testing services, however, as HIV awareness campaigns are also difficult to organise as permission is difficult to obtain. Interviewee (Wnap) adduced:

“The awareness campaigns were also affected by the complicated procedures to get permission.” (Wnap)

On the other hand, Interviewee (Ganp) indicated that the low uptake of HIV tests in the country could be due to the failure of the National AIDS Program (NAP) in reaching out to the target group in the community. (Ganp) claimed:

“They didn’t reach out widely to people as we don’t see any increase in the uptake of HIV testing in the VCT centres.” (Ganp)

❖ *Health care professionals' lack of basic knowledge about handling and counselling HIV patients or potentially HIV infected individuals*

As a result of concentrating HIV/AIDS services in certain places, as well as the stigma attached to HIV/AIDS, many health care professionals lose the basic skills required to manage and counsel individuals suspected of being infected with HIV. In addition, some health care professionals fear HIV/AIDS and so they avoid handling HIV patients and discussing HIV/AIDS with individuals who might be infected. Interviewee (Bnap) described this:

“They are scared!! Although they are health care professionals, some of them are scared and they don't want to deal with HIV. They want centres so, if they suspect HIV, they direct the patients to these centres.” (Bnap)

She also pointed out that health care professionals always express the view that they prefer HIV/AIDS health care services to be located in one place so they can refer suspected HIV infected individuals to it. As (Bnap) said:

“From my experience, when we do workshops to health care professionals about HIV/AIDS most of them want HIV to be centred in one place.” (Bnap)

In addition, she claimed that even the HIV infection is treated as a chronic infection and only simple precautionary measures need to be applied when dealing with HIV patients. Many health care professionals did not want HIV cases to be managed in their health care centres, either because they did not know how to deal with them or they did not have the capacity in their centres. As (Bnap) added:

“You know it is a chronic infection so, either it would be a big hassle for them to have it in their own health care centres, which it should not be because it just requires standard precautions like everywhere else, or they don't have the capacity. Many of them are afraid and forget how it is transmitted! For example, I had a call from one health care professional who said, “Now it is HIV positive so now what do I do!!” (Bnap)

Moreover, she highlighted the lack of knowledge of basic counselling among health care professionals working in primary health centres in spite of the fact that they are the most accessible health care professionals in the health care system. (Bnap) said:

“Primary health care centres: many patients go straight there but many of the health workers, if the lab test says someone is HIV positive, they don’t know what to do. Also basic counselling can be done by them. This is an infection, this is how it’s transmitted and this is not. The first person to be tested should be your spouse and so this is what you can do without any stigma and without making any judgment towards them. As that person will be in shock, you can relax that person and many of them come to us very late because they are scared.” (Bnap)

Interviewee (Ganp) also confirmed that many doctors lack basic counselling skills and do not know how an individual who might be infected with HIV should be approached. (Ganp) said:

“Many doctors don’t have basic counselling skills and they don’t know how they should deal with any suspected HIV case.” (Ganp)

❖ *Competing clinical priorities*

The amount of work that health care professionals have to carry out during their working hours often prevents them from encouraging preventive measures. In addition, the devotion that health care professionals show towards treating medical conditions rather than preventing them ultimately plays a significant role in the low uptake of HIV testing. Interviewee (Bnap) stated that doctors did not spend enough time with their patients to discuss preventive strategies, such as HIV testing. They also did not advise patients to seek help from other providers such as VCT centres. (Bnap) said:

“The doctors always tend to ignore preventive measures because they say we don’t have time to ask a little bit extra or give a suggestion to visit certain places to seek advice.” (Bnap)

Interviewee (Gnap) also supported this claim when he said:

“Doctors generally don’t spend enough time with their patients to advise them about preventive measures in general as they feel they always have other duties which are much more important than prevention consultations.” (Gnap)

It is also important to note that the unfavourable attitude toward investing time in discussing preventive activities against diseases is not limited to HIV; generally, managing medical conditions is prioritised over preventing them. This is what Interviewee (Wnap) admitted:

“In general, most physicians don’t have time to spend in preventive activities.” (Wnap)

❖ *Inadequate number of staff and VCT centres*

A shortage of staff to operate some of the VCT clinics and services has impacted on the utilisation of HIV testing. This shortage has affected the clinics in every way, including logistics and operational aspects. The number of VCT centres is also inadequate in some cities in Saudi Arabia which could also result in the low utilisation of HIV testing. Interviewee (Wnap) claimed that VCT centres face many obstacles which may affect HIV test utilisation, such as a shortage of workers and qualified counsellors. (Wnap) said:

“In terms of the VCT clinics, we face a lot of logistical problems such as having few workers,” he also added, “and a lack of qualified counsellors.” (Wnap)

The inadequate number of staff has also affected the activities outside the VCT centres, such as HIV awareness campaigns. This was also stated by Interviewee (Wnap):

“We also lack staff in general which has held us back in many aspects including awareness campaigns” (Wnap)

In order to increase the number of HIV testing utilisations, it is important to ensure that the number of HIV testing centres is adequate. It is also crucial to ensure that VCT centres have the minimum number of well-trained counsellors required. This was highlighted by Interviewee (Gnap):

“We should make sure that there is an adequate number of VCT clinics in each city and an adequate number of counsellors.” (Gnap)

He also claimed that most of the health care centres in Saudi Arabia lacked clinics for sexually transmitted diseases (STDs) and VCTs which also might lead to low HIV test uptake. (Gnap) said:

“There are no STDs clinics or VCT clinics in most of the health care centres.” (Gnap)

❖ *Inadequate publicity about the HIV testing centres and their services*

Although VCT centres are available in each city in Saudi Arabia, public awareness of their availability and services is claimed to be low. This inadequate publicity has resulted in the uptake of HIV testing. Interviewee (Gnap) stated:

“Although VCT clinics exist as a part of the NAP centres in the country, it’s not working effectively. For example, a lot of people don’t know where they are located and there are no advertisements about the VCT and its services.” (Gnap)

Awareness of the disease is not enough to encourage individuals to undertake the HIV test. Advertising the VCT centres and their locations and services is essential as many individuals do not know where to get tested for HIV. Interviewee (Bnap) indicated:

“The second thing is knowledge related to HIV testing services: a lot of them don’t know that VCT centres are there, they don’t know they can go and get tested without ID.” (Bnap)

5.3.3 HIV/AIDS related knowledge and awareness

The low level of HIV/AIDS related knowledge and awareness was identified by the interviewees as a significant barrier to increasing HIV testing in Saudi Arabia. It was also evident that the level of HIV/AIDS related knowledge among the participants in the quantitative strand of the study was relatively low. The reasons for the low level of HIV/AIDS testing were explored with the interviewees and four main reasons were identified. These four main reasons were; efforts to increase awareness are limited,

messages to the public are ineffective, young people in Saudi Arabia do not educate themselves, and the curricula of secondary schools and universities lack sexual health topics including HIV/AIDS.

A. Reasons for the low level of HIV/AIDS related knowledge and awareness

The three interviewees explained why the HIV/AIDS related knowledge that young individuals in Saudi Arabia have attained was low. Some of the reasons discussed related to the unsustainability of the awareness campaigns and the unsuitability of HIV/AIDS awareness messages. On the other hand, the lack of self-education among young people in Saudi Arabia has also contributed to the low level of knowledge about HIV/AIDS. In addition, in Saudi Arabia, schools and universities were also responsible as their curricula do not include any sexual health related topics such as HIV/AIDS. The four reasons identified are presented below as they appeared in the interviews and direct quotations are offered to clarify the points that were made.

❖ Efforts to increase awareness are limited

Although NAP is conducting numerous activities to increase people's awareness of HIV/AIDS, more needs to be done. It was obvious from the interviews that HIV awareness activities need to be broadened. For example, Interviewee (Bnap) claimed:

“Awareness campaigns do happen but they should be on broader scale. Maybe this is because it is a low priority area, that's why!” She also added: “So, I think with all the effort to spread awareness about HIV/AIDS, we still need to do more!”
(Bnap)

She also claimed that informing the community is the responsibility of the health authorities in the country and thus, if they do not do their job, who will inform the people? She said:

“You see what happened with the Corona virus outbreak. When a lot of deaths start happening the community wanted to know!! But who will give them the

information, of course: it's the Ministry of Health's (MOH) responsibility. We have to give them the information that, "Ok, its spread through this, it's not spread through this" so they can take protective action." (Bnap)

Tailoring awareness campaigns according to the needs of the targeted population, such as young people, is crucial as the ongoing awareness activities are not targeted properly. Both the quantity and the quality of the awareness activities require development. This is what Interviewee (Gnap) adduced:

"The lack of awareness campaigns that target young people mean a lot of people don't have enough information about HIV. So, if something wrong happens, he/she starts to panic and doesn't know what to do and where to go. This small thing could affect his/her entire life but if he/she has been educated about the disease or if he/she get the right information he/she could feel at ease." (Gnap)

The inadequate use of all forms of media to reach all different groups in the community, including young people, has also contributed to the low level of knowledge about HIV/AIDS. Interviewee (Wnap) stated:

"I think there is a lack of proper awareness campaigns at all levels, such as the media and all its branches, educational institutes (schools, universities)." (Wnap)

❖ ***Messages to the public are ineffective***

Designing health messages to promote certain behaviours requires a full exploration of the needs of the targeted population. The current messages relating to HIV/AIDS preventive activities need to be revised. Integrating knowledge and the positive effect of fear are essential to encourage individuals to change their negative attitudes toward HIV/AIDS preventive measures such as HIV testing. For example, Interviewee (Bnap) stated:

"That's how you get people to know about it, you have to jolt them a little bit otherwise they will say ok yah!" (Bnap)

She also added an example of how most individuals in Saudi Arabia perceive the risk of hepatitis. (Bnap) said:

“Do you know people in general not scared of Hepatitis!! Every time I get a case here I ask just generally, “Do you receive the Hepatitis B vaccine?” Most of them say NO even though the route of transmission is the same and even though you need a very miniscule amount to be infected compared to the HIV virus but people are not scared about Hepatitis. Ok, there are some things that scare you and some things that don’t. So, if it doesn’t scare you, you will not take care about it.” (Bnap)

The current messages to the public are also not explicit enough and they lack transparency. In addition, the way that the messages are conveyed to the public is also inappropriate. Interviewee (Gnap) claimed that, although HIV awareness activities are continuing, they are almost ambiguous. (Gnap) said:

“I think there is a lack of awareness through the various form of media. Sometimes, even if there is an awareness activity it lacks transparency as it’s characterised by ambiguity and it’s underestimating the problem.” (Gnap)

Interviewee (Bnap) also highlighted the importance of the ways in which the message is conveyed to the public. (Bnap) said:

“I also believe the way we tell the people also makes a difference.” (Bnap)

❖ *Young people in Saudi Arabia do not educate themselves*

It is not only the responsibility of the health authorities to educate young people about sexual health issues, such as HIV/AIDS; young people in Saudi Arabia also need to exercise influence over their own sexual health education. The lack of self-education among young people in Saudi Arabia could be considered an important reason for the low level of knowledge related to HIV/AIDS among this population in the country. As Interviewee (Gnap) adduced:

“Part of the problem is caused by most of young people being ignorant of self-education about sexual health matters, unless something wrong has occurred or

they have practised any risky behaviour so, at that time judgment is clouded.”
(Gnap)

The lack of self-education in Saudi Arabia is not limited to young people; it is one of the characteristics of Saudi society. Interviewee (Wnap) asserted this:

“I think there is a lack of self-education among most of the individuals in our society about health related matters in general.” (Wnap)

❖ ***The curricula of educational institutes lack sexual health topics including HIV/AIDS***

Sexual health is still a taboo in Saudi Arabia and so educational institutions, such as secondary schools and universities, refrain from including these topics in their curricula. The lack of sexual health topics in the curricula of secondary schools and universities in particular has contributed to the low level of knowledge related to HIV/AIDS among young people in Saudi Arabia, as Interviewee (Gnap) claimed:

“There is a lack of sexual health topics in all educational curricula, including those of schools and universities, as sexual health and sexual issues are still taboo in our society.” (Gnap)

5.3.4 Action plan to increase the uptake of HIV testing in SA

The interviewees proposed certain actions that could increase the uptake of HIV testing by young people in Saudi Arabia. These actions were associated with two themes: increasing the level of awareness about HIV/AIDS, and modifying and enhancing the HIV testing services.

A. Increasing the level of awareness about HIV/AIDS

Increasing the level of awareness about HIV/AIDS is crucial to increase the uptake of HIV testing. Awareness of HIV/AIDS needs to be enhanced since the current HIV/AIDS awareness activities have been proved to be ineffective as it is evident that misconceptions about HIV/AIDS are still rife in Saudi Arabia. The interviews revealed three aspects with

regard to HIV/AIDS awareness activities that require attention in order to make them more efficient in increasing the utilisation of the HIV testing. These are: the message to the public needs to be more clear and transparent; HIV/AIDS needs to be integrated into the curricula; and the VCT centres, locations and services need to be advertised. Each of these three aspects is discussed as they were mentioned during the interviews with the health care professionals; direct quotations from the interviews are also displayed below.

❖ *The message to the public needs to be more clear and transparent*

The HIV/AIDS awareness messages should be clear and transparent since the current messages are ambiguous. In addition, a lot of important information about HIV/AIDS in Saudi Arabia has been omitted thus, it is not only the quantity of awareness activities which is important; the quality of the messages that are conveyed is what will make the difference. For example, interviewee (Bnap) stated that:

“You let them know that, ok look, this is the problem: there is no cure, there is prevention and you can prevent yourself and get your status known so, this helps them. Unless we don’t give them this information clearly and be open about it. I believe you should be completely open about it with the community.” (Bnap)

The interviewee (Bnap) also gave an example about the situation that the Ministry of Health faced during the recent MERS outbreak:

“Again, as you see what happened with the Corona virus, all the people were upset. Why didn’t you tell us before and we don’t know what to do. It’s spread through an airborne route and this and that. So, let them know clearly.” (Bnap)

Producing clear informative HIV/AIDS awareness leaflets and distributing them to the targeted population is important to increase the level of awareness about HIV/AIDS in order to increase sequentially the uptake of HIV testing. Interviewee (Gnap) indicated:

“It is also important to prepare and distribute leaflets and brochures that contain very clear information about HIV/AIDS and the VCT services.” (Gnap)

❖ ***HIV/AIDS needs to be integrated in the curricula***

Almost all the behaviours that increase the risk of contracting HIV are behaviours prohibited by Sharia law which is adopted in Saudi Arabia. In addition, taboos and stigma related to HIV/AIDS are still major obstacles in responding to HIV in Saudi Arabia. This prohibition makes the coverage of HIV/AIDS topics in the schools' and universities' curricula problematic. However, sexually transmitted diseases, including HIV/AIDS, should be integrated into the curricula, as the interviewees suggested.

Interviewee (Bnap) emphasised the importance of integrating HIV/AIDS topics in the curricula of educational institutes. She also described the direct and indirect benefits of integrating HIV/AIDS topics in the curricula. She said:

“So, if we have it included in the curriculum parents won't get uncomfortable with it because they know this is part of the conclusion: growing up, teenager's stuff, taking care of yourself and your health and not only keeping HIV but KEEP ALL OF THEM. So, as a general health topic, parents at home would also be comfortable. Okay, my child is getting information about general health. Children will also ask their parents questions and if the parents don't know, they will do some research. Okay my child is talking about this so what is this it helps. It should be included in the curriculum, definitely!” (Bnap)

Integrating HIV/AIDS in the curricula will also help young people to obtain accurate and trustworthy information. This is how interviewee (Gnap) asserted the importance of including HIV/AIDS topics into educational programmes. (Gnap) said:

“It's also important to include AIDS and other STDs in school curriculums so, this will help young people know the right information from trusted sources.” (Gnap)

❖ ***Advertising the VCT centre locations and services***

One of the reasons that HIV testing uptake is low in Saudi Arabia is that most individuals do not know the locations of HIV testing centres. In addition, the services provided by

these centres are also unknown to the public. Thus, advertising the locations and services of VCT centres should become one of the key areas of information that HIV/AIDS awareness activities address. The importance of spreading the message about the VCT centres' locations and services was highlighted by interviewee (Bnap). (Bnap) said:

“It’s really by word of mouth and by a lot of awareness about the VCT centres we can get the number of uptakes to increase. For example, we received two people yesterday out of the blue. Those were foreigners. They came and said we’ve heard and we want to get the test done and know how we can get it done. They heard somebody talking about it and they came forward.” (Bnap)

B. Modifying and enhancing the HIV testing services

Modifying and enhancing the existing service is considered necessary to increase the uptake of the HIV test by young people in Saudi Arabia. The nature of the HIV testing services needs to be reformed and the services provided through these centres should also be improved. The interviewees suggested that five aspects relating to the HIV testing services in Saudi Arabia that need to be improved or integrated in order to increase the uptake of the test by young people. Interviewee (Bnap) suggested that “HIV” could be omitted from the name of the testing and counselling centres so that the centres' services would be broader and not restricted to HIV. (Bnap) said:

“If we don’t keep “HIV testing and counselling centre”, if we simply keep “Testing and counselling centre” you go in and you meet a counsellor in a general talk about different infectious diseases, you could include STDs and you could go for screening and decide at that point. In that private conversation with the counsellor, you could say I want this test.” (Bnap)

She also believed that adopting a broader concept of testing and counselling should be accompanied by the integration of preventive activities, including HIV testing with preventive activities for high priority diseases in the country. (Bnap)said:

“I think we are, like, very reserved. Until now we are in the corner when we need to be in the centre of all the activities that are happening and we need to have a broader concept, not only HIV. If we have general testing and counselling centres they could include other sexually transmitted diseases and different kinds of counselling.” (Bnap)

Interviewees (Gnap) and (Wnap) also pointed out the possible effect of changing the name in order to reduce the effect of stigma. They preferred to develop STD clinics rather than VCT clinics as, by doing this, the effect of social stigma would be reduced. Interviewee (Gnap) indicated:

“I think it would be better if we could develop STD clinics rather than VCT clinics as this might decrease the effect of stigma related with HIV/AIDS. As well, it will help in addressing other important STDs” (Gnap)

Interviewee (Wnap) also asserted the advantage of changing the name and the services with regard to the level of stigma. (Wnap)said:

“It is also noted that stigma is affecting our service because people don’t want to walk into our department so I think, if we could make the clinic for sexually transmitted diseases in general and HIV testing is one of them, it would help a lot.” (Wnap)

❖ *VCT centres’ locations*

Implementing effective VCT centres is an integral part of HIV prevention. However, the locations of VCT centres have an impact on the number of users of their services. Relocating the VCT centres in places close to where young people gather would increase the uptake of the test by this group of people. Interviewees (Gnap) and (Wnap) indicated the importance of implementing the VCT centres next to the places where young people gather. Interviewee (Gnap) said:

“That will help, especially if these clinics are located next to the places that young people gather such as gyms, cafes and shopping malls.” (Gnap)

Additionally, Interviewee (Wnap) stated:

“I also think the VCT clinics should be located next to where young people gather.”
(Wnap)

Interviewee (Bnap) explained how the VCT centres’ locations could affect the HIV test utilisation as some places could increase the level of stigma, decreasing the uptake of the test. (Bnap) said:

“We can have VCT centre here but again it is a health sector so, people maybe hesitate to walk in to the centre but luckily we have a lot of departments in this building so, you could be walking to Hepatitis, vaccination or anything so, it is a quiet area and that helped a lot. But places like King Saud Hospital’s VCT centre, however; almost everybody knows that it’s an infectious disease hospital. Ok you’re going there so there is something wrong why you’re going there so this holds us back and keeps the numbers down.” (Bnap)

She also claimed that implementing VCT centres in non-health related facilities could increase the uptake of the HIV test in general. (Bnap) stated:

“If we have it in more places which are not in health related centres that will dramatically increase the uptake.” (Bnap)

❖ ***Developing VCT centres for young people***

Another important step to increase the uptake of HIV testing by young people is to develop VCT centres that only target young people. Many countries around the world have developed VCT centres that aim to serve young people only. As a result, the number of test consumers has increased. Developing social group-oriented VCT centres would have a dramatic effect on the utilisation of the test as such a facility is designed according to the needs of the targeted group. Interviewee (Bnap) claimed that HIV testing should be provided to all different groups in society. (Bnap) said:

“Having the VCT centre in areas where young people go, like gyms, and you could have them in family oriented buildings. I mean, you should cater the VCT for every part of the society. So, you know where the youth goes and you could have the centre there. You know where the families go and have one over there. Society is

a mixture; you will not find only one group but you will find different groups.... So, I think if we have society group-oriented VCT centres, it will help a lot to increase the test uptake. For example: if we have VCT centres in shopping malls which are family oriented here in SA. Or in Gyms or cafés that are youth oriented, it will make the test centre friendly and acceptable to the individuals and in turn increase the uptake” (Bnap)

Interviewees (Gnap) and (Wnap) also asserted the merits of developing VCT centres that target young people in Saudi Arabia. As Interviewee (Gnap) stated:

“I think if we could develop a VCT clinic that targets young people, it would help a lot in addressing this group of individuals.” (Gnap)

On the other hand, Interviewee (Wnap) pointed out the successful implementation of VCT clinics for young people in other countries worldwide. (Wnap) said:

“As in many countries all over the world there are clinics ‘VCT, STDs’ that focus on young people. I think this also could help in increasing awareness about the disease, as well as increase awareness about sexual health in general. In addition, I think this kind of clinic would be more acceptable to this group of people.” (Wnap)

❖ *Increasing the use of Mobile VCT (MVCT)*

MVCT has been established in Saudi Arabia to increase the accessibility and the utilisation of the HIV test and increasing its implementation was clearly encouraged by the interviewees. Although the utilisation of the HIV test through traditional VCT centres appears to be a challenge in Saudi Arabia, MVCT seems to be a promising resolution. Interviewee (Bnap) claimed that the way that MVCTs function clearly encourages the utilisation of the tests. (Bnap) said:

“Mobile VCTs help us a lot!! Because we choose different locations and we see a lot of people in the mobile VCT because you’re not waiting for them to come but you’re providing the service where they are. Ok, the service is here, please come!! So, a lot of people do walk in.” (Bnap)

Interviewee (Gnap) also felt that increasing the use of MVCTs is one of the most important actions that need to be addressed to increase the test's utilisation by young people in Saudi Arabia. (Gnap) said:

“We should also increase the number of HIV testing campaigns through mobile VCT.” (Gnap)

Additionally, Interviewee (Bnap) also highlighted the importance of the MVCTs in increasing awareness of HIV/AIDS. (Bnap) said:

“Because we don't only advertise the test but you can walk in, take information and simply walk out without even getting the test. But a lot of people opt for the test.” (Bnap)

Interviewee (Wnap) noted that the vast majority of young people utilised the HIV test through MVCT or they preferred MVCT. However, some of them walked into an MVCT facility and asked about the traditional VCT clinics. (Wnap) said:

“Although it's difficult to judge this in our centre in Makkah as the Mobile VCT is still new as it's just launched 6 months ago, in Jeddah city. Mobile VCT started working 10 years ago which shows greater usage of this kind of VCT rather than traditional VCT from young people, both male and female. On the other hand, a very tiny percentage of people came to the Mobile VCT and asked about the traditional VCT centre in the area as they feel that they will be judged by their friends and family who are accompanying them if they get tested in the mobile VCT. However, I am still confident that the Mobile VCT will help to increase the uptake of HIV tests in SA as it goes to the people so they don't need to come to a traditional VCT and wait for a long time in a queue to get tested.” (Wnap)

❖ Training the staff and other health care professionals

Ensuring that VCT staff are well trained to operate the centres effectively is also important to increase the utilisation of the test. For example, if someone has had a bad experience when he/she has used the VCT centres' services, he/she will reflect upon this experience by spreading this to others, indirectly leading to low HIV test uptake. In

addition, other health care professionals should also receive training on how to handle a suspected HIV case in their health centres. Interviewee (Bnap) asserted the importance of constantly educating health care professionals about HIV/AIDS and teaching them how to handle HIV positive individuals or HIV suspected individuals. (Bnap) said:

“So, if you educate doctors, nurses and other health professionals randomly periodically as they should always be reminded it’s a chronic infection, this how it spreads, when you need to isolate the patient and, as long as the patient with you, this is what you have to do. It would help!” (Bnap)

Interviewee (Gnap) also emphasised the important role that the Ministry of Health in Saudi Arabia should play in regularly educating health care professionals about HIV/AIDS. (Gnap) said:

“The MOH should provide training courses and workshops to all health care professionals.” (Gnap)

He highlighted that ensuring VCT centres are well equipped and the counsellors are well trained is essential. (Gnap) added:

“In terms of VCT centres, we need first to ensure that these VCT clinics are well equipped and the counsellors are well trained and qualified.” (Gnap)

5.4 Chapter summary

This chapter has presented the quantitative findings that were gathered through the questionnaire distributed to Umm Al-Qura University students aged 17-25 years. The main purpose of the questionnaire was to explore the factors that influenced the uptake of the HIV test among people aged 17-25 years in Saudi Arabia. The individual level factors which were assessed through the questionnaire included: knowledge related to HIV/AIDS, risk perception and attitude toward HIV testing. Scores from the responses were computed for the three main factors. In addition, the attitude toward HIV testing scale consisted of six categories that also represented factors that might affect the HIV test utilisation such as confidentiality, beliefs and fears.

Additionally, the findings that emerged from the interviews with HIV/AIDS health care professionals are also presented in this chapter. Three health care professionals working in the HIV/AIDS health care sector in Saudi Arabia for more than five years in two different health sectors in the country participated in the interviews. In particular, two interviewees were working with NAP, one of the Ministry of Health's initiatives to tackle HIV/AIDS in the country, in two different cities in the western province of Saudi Arabia. In addition, one of the interviewees was working in one of the major tertiary hospitals in the western province of the country. The main focus of the interview was to comment on the questionnaire findings, as well as to explore the factors from the perspective of health care professionals.

The level of knowledge and attitudes toward HIV/AIDS appear to be the most important challenges that impact on the uptake of the HIV test, while cultural norms, religious beliefs and the sensitivity of the subject continue to complicate the challenges that influence the HIV testing uptake by young people in the country. In addition, they also affect how the health system and the health care professionals' actions to tackle the disease. Fears related to HIV/AIDS are also a prominent barrier hindering the HIV health care services in the Kingdom.

The participants in the interviews highlighted opportunities to improve the HIV test uptake among young people in the country. Expanding the effort to increase the level of HIV/AIDS awareness is the first step to improve the uptake of the HIV test. It is also important to review the existing policy and programmes designated to tackle HIV/AIDS in the country.

The next chapter offers further analysis and discussion of the key findings from the data collected through the questionnaire distributed to university students, together with an interpretation of the findings from the interviews with HIV/AIDS health care

professionals. The findings are integrated and discussed in the light of the HIV/AIDS literature and existing theories. In addition, the methodology of the study is reviewed and further reflections on the challenges facing the study process are provided. Moreover, potential implications of the findings for policy, practice and research are offered.

6 Discussion chapter

6.1 Introduction

The aim of this study was to discover the factors that hindered the uptake of voluntary HIV testing among young people in Saudi Arabia. The aim was achieved by exploring, using a self-completed online questionnaire, the level of HIV/AIDS-related knowledge, HIV risk perception, attitudes towards HIV testing, and the reasons that an individual chooses to test for HIV or not. In addition, semi-structured interviews were conducted with healthcare professionals (HCPs) working in the HIV/AIDS field in Saudi Arabia. Thus, the study considered the perspective of professionals to understand and explain in depth the low uptake of HIV testing among young Saudi people. The study focused on people aged between 17 and 25 years of age, and participants were recruited from the student population of Umm Al-Qura University. Close attention was given to differences in the variables across genders, as well as between and within the age groups of the participants.

The purpose of the current chapter is to discuss the key findings of both the quantitative and qualitative strands of the study in the light of existing literature and theories about HIV prevention, particularly those related to HIV testing. The relationship between the two data sets are also considered and articulated in this chapter.

A reflective account of the whole process of the research and its stages is also incorporated in this chapter. The implemented methods and the methodology are reviewed and the quality of the research evaluated.

6.2 The relationship between the quantitative and qualitative data sets

One of the central aspects of this research is the exploration of the factors that affect the utilisation of HIV testing, using a mixed methods approach and with two distinct groups of individuals: service users (young people) and service providers (HIV/AIDS health care professionals). Although the two groups of individuals are different, their interaction is inevitable because undertaking HIV testing mandates contact with the Saudi Arabian health care system. Thus, both young people and HIV/AIDS healthcare professionals were included in the study.

Adopting a quantitative method in the form of a self-completed online questionnaire to identify the factors that could hinder the uptake of HIV testing among young people, appeared to be a coherent approach, given the cultural and religious sensitivity of this issue in Saudi Arabia. In addition, it allowed subgroups, as well as certain variables within the sample, to be compared and contrasted. Interviewing health care professionals further increased the clarity of the picture as a whole about the HIV testing process and the challenges that hold young people back from undertaking the test.

In this mixed methods study, it appeared that the individual-level factors that shaped how an individual responded to HIV/AIDS-preventive measures, particularly HIV testing, were related to a complicated multidimensional set of problems. A person's attitude is not merely driven individually; environmental components, such as culture, the healthcare system and the attitude of healthcare professionals, influence these attitudes. It was also evident that healthcare professionals were facing logistical, bureaucratic and societal pressures which played an important role in the low uptake of HIV testing in general. For example, the workload and other competing clinical priorities made the HCPs ignore preventive measures such as HIV testing and counselling. Other logistical matters, such as low numbers of staff at the VCT centres, were also acknowledged by the interviewees as one possible reason for the low uptake of the HIV test.

As was evident from their accounts, the HIV/AIDS healthcare professionals who were interviewed stated that they were not confident that the available HIV-preventive programmes and HIV-testing processes were effective in tackling HIV/AIDS among young people in the country. Their accounts were closely linked to and grounded in their personal experiences of working in the field of HIV/AIDS in Saudi Arabia. Although the interviews with the HCPs served to explain the results that the quantitative strand revealed, their interpretations of the issues were important in understanding the research inquiry in greater depth and from another angle, enabling the researcher to look beyond the statistics.

In terms of young people's responses, it was clear that healthcare professionals and the healthcare system were linked to how young people act, whether in a favourable or unfavourable manner, towards HIV testing. For example, not trusting healthcare professionals to keep the test results confidential, and the attitude of healthcare professionals in the testing clinics, were acknowledged as factors putting a number of young people in the study off being tested.

The sample of HIV/AIDS healthcare professionals was selected to include key people involved in the delivery of HIV healthcare services in the western province of Saudi Arabia. Umm Al-Qura University is located in the western province in the holy city of Makkah. One of the challenges of conducting this research was the recruitment of professionals to the study, as the number of professionals involved in providing HIV/AIDS-related healthcare services is small and many of those who were invited declined to participate. Consequently, only three key HIV/AIDS healthcare professionals were interviewed. Therefore, extra care was taken when reporting the data to ensure the anonymity of these participants.

The key findings that emerged from the two sets of data are discussed separately here, beginning with the quantitative findings. Finally, the integration between the two sets of

findings is explored in the discussion of the key findings that emerged from the study as a whole.

6.3 Discussion of the key findings (quantitative strands)

6.3.1 Reasons for undertaking or avoiding HIV testing

The prevalence of HIV/AIDS is low in Saudi Arabia, approximately 0.02 percent of the general population in 2014, however, this could be misleading as the number of reported infections might under-represent the true figure (UNAIDS/KSA, 2015). In addition, the prevalence of HIV in Saudi Arabia has been calculated solely from data derived from blood donors and mandatory pre-marital testing; therefore, this figure might have failed to capture all the cases of HIV. In fact, there are 11 groups among the Saudi Arabian population that are routinely tested for HIV. These groups include those with sexually transmitted infections (STIs), prisoners, injecting drug users (IDUs) at rehabilitation centres, and tuberculosis (TB) patients.

Current research, such as the study conducted by Kabbash et al. (2012) and the Saudi Ministry of Health (UNAIDS/KSA, 2015), have highlighted the rising incidence of HIV among the general population, as well as changing patterns and sexual practices among young people in the country. In a recent study conducted in Saudi Arabia among young men in Riyadh, it was found that 31 percent of the participants, who were aged 15-20, claimed to have engaged in at least one pre-marital or extra-marital sexual relationship (Raheel et al., 2013). It was also evident from the literature that the strong cultural, moral and legal characteristics of Saudi Arabia and other Arabic Islamic countries in terms of forbidding and penalising pre- and extra-marital sexual relationships, homosexuality and other HIV high-risk behaviours, had initiated an unfavourable attitude towards HIV health-related services. These have over-emphasised the sensitivity of HIV/AIDS and sex-related topics which has, in turn, increased the level of stigma and taboo related to

HIV/AIDS, leading to a decrease in the utilisation of HIV and other STI health-related services.

In spite of the fact that Voluntary Counselling and Testing (VCT) clinics are now available and accessible to everyone and provide their services while adopting an anonymous approach, a low uptake of the test was noticed among the current study sample, as only 5.5 percent of the participants had been tested for HIV.

This study provides insight into the widely reported public health concerns that challenge the implementation of HIV testing, and attempts to explore the reasons behind the low uptake of HIV testing by young people in Saudi Arabia. The three most common reasons indicated by the participants in the current study were in agreement with the literature. However, one of these reasons was widely mentioned globally as the main reason for not being tested for HIV across various populations; this is the low perception of HIV risk. The most common reason indicated for not being tested for HIV (low HIV risk perception) was congruent with other research conducted worldwide in both developed and developing countries; 48 percent of the participants in the current study stated that exposure to HIV was considered unlikely. The HIV test has not being offered was the second most common reason given for not being tested for HIV, indicated by 36 percent of the participants. This was also demonstrated as a barrier that affected the utilisation of HIV testing by young people aged 12-24 in the USA (Peralta et al., 2007). In addition, another study conducted in the USA by Johnson et al. (2011) claimed that healthcare providers were not offering HIV tests as a result of either time constraints or an inadequate level of awareness that healthcare personnel had regarding HIV testing guidelines. Another less common reason for not being tested shown in the current study, which was indicated by 4.6 percent of the participants, was not knowing the location of HIV testing centres. This was also indicated by young people in the Balkans as a barrier they faced in undertaking HIV testing (Delva et al., 2008). In addition, Payne et al. (2006) stated that

African-American college students aged 18-24 lacked information about testing sites and this added to the obstacles that hindered their uptake of HIV testing. Moreover, clients of a mobile VCT campaign in Tanzania also stated that not knowing where to get tested was one of the reasons that hampered their HIV testing (Ostermann et al., 2011).

Although only seven participants selected fear of the consequences of a positive result as their main reason for not being tested, the literature indicated that fear of the consequences of a positive result was the second most frequently cited barrier at an individual level across various groups worldwide from among reasons blamed for the low uptake of HIV testing (McCoy et al., 2009, Mills et al., 2011, Schwarcz et al., 2011). This might be due to the perception that most of the participants considered their exposure to HIV to be unlikely.

Of the participants who reported that they had previously been tested for HIV, 25 percent indicated that they had only been tested for HIV as part of the mandatory pre-marital testing programme. Saudi Arabia is one of the countries that has adopted legislation to enforce pre-marital HIV testing as part of its mandatory pre-marital testing programme. However, debate about this form of HIV testing is ongoing. In addition to human rights and other social concerns, it is feared that mandatory testing could be deceptive and ineffective in terms of prevention. In other words, the window period, which is one of the characteristics of HIV, could lead to a false negative result, which could in turn be interpreted by the tested couple as meaning that they are secure and their sexual practice determined as safe.

6.3.2 Misconceptions about HIV/AIDS

The existing literature relating to knowledge and awareness of HIV/AIDS in young people focuses on a variety of subpopulations. These subpopulations are divided by, among other characteristics, geographic region, lifestyle and gender. The literature has

also considered the presence of misconceptions in a variety of settings and subpopulations, as demonstrated by a lack of knowledge of key facts about HIV/AIDS. Lack of knowledge about HIV/AIDS was also demonstrated in the current study, which may lead young people to be reluctant to take up HIV testing and other HIV/AIDS health-related services.

A. Modes of transmission

This study identified similar misconceptions among the participants with some statistically significant differences between age groups; no statistical differences were found across genders. Misconceptions were apparent in almost all aspects of HIV/AIDS-related knowledge, including preventive measures, severity, epidemiology and routes of transmission. However, misconceptions about some of these aspects are worthy of comment. For example, 62 percent of the participants either did not know or incorrectly acknowledged that mosquito bites could transmit HIV. Although almost more than three decades have passed since the first case of HIV was detected, HIV being transmittable by a mosquito bite is still one of the most common misconceptions identified in the literature. Kaur et al. (2014) examined the degree of knowledge of HIV/AIDS among employees working at a company manufacturing medical products in Malaysia and found that HIV being transmittable by mosquito bites was believed by 30.9 percent of the participants. The same pattern of misconception was apparent in a study conducted in Saudi Arabia among female nursing students, which showed that 34 percent of the participants thought that mosquito bites were one of the modes of transmission of HIV (Abolfotouh et al., 2014). In addition, a recent study conducted in Japan to assess knowledge of HIV among non-medical professionals found that up to 50 percent of the study sample believed that HIV could be transmitted by a mosquito bite (Wang et al., 2013). The researchers in the last study found these results to remain stable across demographic variables, including age and gender. However, higher education was significantly correlated with lower misconception rates (Wang et al., 2013).

On the other hand, research conducted in Yemen showed that misconceptions about HIV/AIDS were not limited to non-medical professionals, as the study was conducted to evaluate the knowledge and beliefs of students at health institutes. In Al-Rabeei et al. (2012), compared with other studies, the level of knowledge was high, with nearly two-thirds being correct on all items. However, misconceptions identified in this study were similar to those found in other studies, largely around the manner in which HIV can be transmitted (Al-Rabeei et al., 2012). This high level of HIV/AIDS related knowledge found in the later study could be due to the participants' characteristics as they were students at health institutes which may increase their knowledge of HIV/AIDS.

Mother-to-child transmission, or vertical transmission, appeared to be widely misunderstood by the participants in the current study. In addition, sharing meals with an HIV-infected individual as one of the transmission modes was incorrectly selected by 31.6 percent of the participants. All these misconceptions around HIV modes of transmission have been observed in the literature. However, the current study revealed the presence of these misconceptions in male and female university students in Makkah city, Saudi Arabia.

B. Disease severity and seriousness

In terms of HIV/AIDS severity, 73.7 percent of the participants considered HIV to be a curable disease if detected early and 55.7 percent of the participants believed that a vaccine existed that could stop adults from contracting HIV. These astonishing figures demonstrate how misconceptions might lead to a deceptive perception of reassurance which could, in turn, encourage risky behaviours and prevent individuals from taking preventive measures into account. Similar findings were noticed in a study conducted to explore STI and HIV/AIDS-related awareness among adolescent schoolgirls in India. The study found that 30 percent of the participants believed that HIV/AIDS could be cured (McManus and Dhar, 2008). Another more recent study conducted in India showed that

47.5 percent of the sample drawn from the general population thought HIV was curable with medication (Meena et al., 2013). A recent qualitative study conducted to assess young Zambian women's knowledge of HIV/AIDS revealed that, although the majority of the participants considered HIV an incurable disease, a few of the participants believed HIV could be cured by prayer (Ngoma et al., 2015). Although only a small proportion of participants in the later study stated that HIV could be cured, this shows that regions with a high prevalence of misconceptions about the severity of HIV still pose a challenge. Misconceptions about curability and the availability of a vaccine that would protect an individual from being infected were also found in a study conducted in Pakistan among public health college students. Twenty-three percent of the students participating in the study thought that an HIV vaccine was available and nearly half of the participants believed that there was medication that could cure AIDS (Akram et al., 2015). Most of these misconceptions could be corrected if the utilisation of VCTs increased, as pre- and post-testing counselling appears to be one of the means that could enhance understanding about HIV/AIDS. For instance, Kumar et al. (2012) conducted a study to assess the knowledge of high school students in India and showed greater improvement in the level of knowledge and awareness between pre- and post-HIV testing. Kumar et al. (2012) observed an 80 percent improvement in relation to the misconception about the availability of a vaccine protecting against HIV following the post-test assessment of knowledge. In spite of the fact that misconceptions about the severity and seriousness of HIV/AIDS are common elsewhere, these seem to exist on a larger scale in Saudi Arabia. This could be due to the lack of proper sexual health education for young people. This, in turn, has resulted from policy makers' lack of commitment to introducing such education programmes into school curricula. Socio-cultural values and traditions also contribute to the reluctance to introduce sexual health education in Saudi Arabia.

C. Prevention and HIV testing

Knowledge concerning preventive measures and information related to HIV testing also appeared to be similar in terms of the level of misconceptions revealed. For example, 40.1 percent of the participants thought that taking antibiotics would prevent an individual from contracting HIV. Peltzer and Promtussananon (2005), in a study undertaken in South Africa, found a similar percentage (37.8 percent) of participants who thought antibiotics would protect against HIV/AIDS. In addition, Ghanaian university students also responded very similarly to the same questions as 48.6 percent believed that antibiotics would protect against HIV (Asante et al., 2014). As in previous studies conducted elsewhere, it was clear in the present study that when the HIV test results could be deemed to be definite was commonly misunderstood by participants.

❖ Gender and age group differences

Overall, the current study, as well as the existing literature in this area, showed little variation in terms of age or gender. The present study showed no significant statistical differences in HIV/AIDS-related knowledge scores between male and female participants. However, there is some evidence in the literature to show that women have fewer misconceptions and a greater knowledge of HIV/AIDS. For example, when comparing the findings of Ciampa et al. (2012) and those of Kaur, Izani and Gopalakrishnan (2014) on misconceptions regarding condom use, female participants had more knowledge about the preventive feature of condoms with regard to HIV infection. In addition, Asante et al.(2014) indicated that the HIV/AIDS-related knowledge of women compared to men is tending to increase; however, education efforts are reducing misconceptions overall. On the other hand, Al-Rabeei, Dallak and Al-Awadi (2012) found that men may have a higher overall level of knowledge. The findings of the present study with regard to gender differences in terms of overall knowledge scores were in agreement with the findings of Wang et al. (2013) as well as those of Durojaiye et al. (2011). These revealed no gender

differences in relation to HIV/AIDS knowledge among their participants. Although this finding concurred with some previously conducted studies in different parts of the world, this result was unanticipated given the fact that women in Saudi Arabia are still disadvantaged in terms of accessing education as women require a male guardian's approval before they can apply to any educational institution or seek healthcare services (Mobaraki and Soderfeldt, 2010). Societal norms and traditions restrict women's mobility which could also impact on the access of females to health-related information, including those most taboo services such as sexually transmitted disease clinics or VCT centres. On the other hand, men in Saudi Arabia experience freedom and autonomy from the early years of their adulthood so they have better chance of knowing about HIV/AIDS in general.

There is some evidence to indicate that younger groups have a lower prevalence of misconception (Lan et al., 2014). However, Huang et al. (2005) found a significant difference in HIV/AIDS knowledge among university students by age where older students were more knowledgeable about HIV/AIDS in general; this was consistent with the present study's findings.

The significant gap in HIV/AIDS-related knowledge among young people in Saudi Arabia was anticipated, as most of the studies conducted to assess HIV/AIDS knowledge have reached this conclusion. The overall HIV/AIDS knowledge scores in this study were consistent with the scores obtained by Badahdah et al. (2010) in assessing HIV/AIDS knowledge among male university students in Riyadh. However, the present study offers a comparison between subgroups according to age and gender. Although the difference between the HIV/AIDS knowledge score of male and female participants was statistically non-significant, none of the previous studies conducted in Saudi Arabia regarding this matter have assessed differences across the genders. The present study also confirmed differences in the scores across age groups since the HIV/AIDS knowledge score for those

aged between (17-19) years differed significantly from the other two age groups. In addition, the study assesses the relationship between the level of HIV/AIDS knowledge and attitudes towards testing and risk perception, which are discussed later in the chapter.

The socio-cultural characteristics of Saudi Arabia and other Islamic countries label sex-related topics as extremely sensitive. Saudi Arabia is one of the countries that adheres thoroughly to Islamic principles, which has an impact on its legal system, socio-cultural issues and political aspects, and sex education. The impact of Saudi Arabia's Islamic culture on discussion and education about HIV/AIDS is no exception. Islamic principles prohibit most HIV-related high-risk behaviours, such as promiscuity, homosexuality, injecting illicit drugs, and sexual intercourse outside marriage. Therefore, societal norms and religious beliefs do not tolerate these behaviours. In addition, the legislation in the country criminalises and punishes those who practise such behaviour, which may have prompted the silence and sensitivity surrounding these topics. Consequently, sex education, including that related to sexually transmitted diseases, encounters societal rejection and receives less political commitment, particularly for young people. The fear that incorporating sex education in school and university curricula would encourage engagement in unacceptable sexual behaviour has been observed in many countries in the region, including Saudi Arabia. However, it has been widely argued that this fear appears to be groundless as a number of studies have demonstrated that adequate sex education would instead tend to delay sexual intercourse and clarify misconceptions, therefore decreasing the likelihood of contracting STIs, including HIV.

6.3.3 HIV risk perception

This study focuses on risk perception as it applies to the population of young people in Saudi Arabia, particularly university students. However, most of the existing literature focuses on risk perception in relation to high-risk behaviours. Unfortunately, the present study was not able to assess the participants' risky behaviour because of the sensitivity of

these topics in the socio-cultural setting of Saudi Arabia. Risk perception is a challenging field for public health interventions, which also affects those related to HIV preventive measures, including HIV testing. Young people in particular appear to underestimate their risk of contracting dangerous or fatal diseases, such as AIDS and cancer. This notion is explained by optimistic bias theory, the sense of “Can’t happen to me”, with young people feeling that it is almost impossible to contract such a disease at their age (Eiser, 1986). Another potential reason for HIV/AIDS underestimation among young people is the general perception of invulnerability that young people have (Macintyre et al., 2004). Young people often identify HIV/AIDS as a distant disease which only affects people other than themselves. Fear of stigma could also play a role in an individual’s low-risk perceptions as that person may think that if he/she admitted to being at high risk of contracting HIV, he/she would be stigmatised.

In this study, HIV risk perception was evaluated using a three-item scale and the results showed that the majority of the participants demonstrated moderate to high HIV risk perceptions. HIV risk perception scores ranged from 3 to 15 and the mean score was 10.8, with the most common score being 12. In addition, the overall average scores revealed that the male participants’ scores were slightly higher than those of the females on the HIV risk perception scale. This was a statistically significant difference as the p-value was less than the significant level (0.05). However, one of the items on the attitude towards HIV testing scale also offered an assessment of risk perception: *“I would not consider getting an HIV test because my behaviour puts me at a very low risk”* which indicated a low risk perception among 59 percent of the participants. Although the questionnaires were completed independently and anonymously, the contradiction in the results could be due to social desirability bias. In other words, sexuality and its related behaviours vary across populations and cultures and, as most of the high-risk behaviours for contracting HIV are strongly disapproved of and regarded as immoral in the Saudi

Arabian context, most of the participants perhaps responded to that item in accordance with socio-cultural norms.

Most of the literature about young people's HIV risk perceptions shows a low risk perception across young populations worldwide, regardless of the state of HIV epidemics. For example, in the USA, Peralta et al. (Peralta et al., 2007) concluded that 54 percent of the respondents thought that they could not be HIV positive because they did not feel at risk of contracting HIV. In South Africa, Macphail and Campbell (2001) adduced that almost 70 percent of young men stated that there was no chance that they would become infected with HIV. In addition, research conducted in Zambia reported that 52 percent of young people in the study indicated that they were not at risk of contracting HIV (Magnani et al., 2002). The low perception of risk was also noticed across various population subgroups and was not limited to young people. It was also claimed that low HIV risk perception was one of the most frequently cited factors contributing to the low uptake of HIV testing worldwide.

Although the present study did not consider assessing HIV high-risk behaviours due to the socio-cultural sensitivity of these activities, a number of studies have evaluated the relationship between risky HIV behaviours and risk perceptions. For example, Muchimba et al. (2013) noted that a propensity towards risky behaviour was different from a perception of risk. While a perception of low risk may result in behaviours that could help spread HIV, such as not using a condom, someone may be more inclined towards risk generally in spite of an accurate perception of risk (Muchimba et al., 2013). Additionally, Osorio et al. (2015) examined the risk perception and beliefs of adolescents from the Philippines, El Salvador, and Peru. They found that approximately 13.4 percent perceived no risk, 22 percent perceived low risk, 23.7 percent perceived medium risk, 13.7 percent perceived high risk, and 12.1 percent perceived very high risk (Osorio et al., 2015). Interestingly, despite the fact that low perceived risk was related to not wearing a condom,

there was no significant difference in condom use by risk perception level although this could be due to cultural similarity between those three states. The main religion in the Philippines, El Salvador and Peru is Catholicism, a form of Christianity which has strict rules regarding condom use. On the other hand, in Cameroon, a study conducted by Meekers and Klein (2002) found a positive correlation between risk perception and using condoms among young people. In addition, the consistent use of condoms among university students in Kenya appeared to be correlated to high HIV risk perception (Omungo, 2008). The findings from the aforementioned studies show that socio-cultural norms and environmental factors influenced the behaviours of individuals even though the benefits of practising the behaviour (i.e. using a condom) outweighed the harms.

❖ *Gender and age group differences*

A few studies have observed gender differences in the self-reporting of risk perception. However, statistically significant differences were only detected in some of these studies (Anderson et al., 2007, Stein and Nyamathi, 2000). The findings of the current study showed a statistically significant difference across gender for risk perception scores; this was consistent with findings reported by Li et al. (2004) and Macintyre et al. (2004). The scores of male participants in the current study indicated a slightly higher degree of perception of risk. In other words, male participants reported greater vulnerability to HIV than did female participants. This finding could be explained by Saudi Arabian societal norms regarding men having a considerable amount of freedom and independence from an early age (Raheel et al., 2013). This societal norm may lead to greater openness to HIV risk on the part of men. In addition, it might also contribute to men engaging in HIV high-risk activities as a result of their perceived invulnerability to the risk of contracting HIV. For example, Raheel et al. (2013) identified that 31 percent of Saudi male students in Riyadh aged 15-20 had engaged in pre-marital sexual intercourse. Another possible reason that might lead men to perceive they were at a slightly higher risk of contracting

HIV was that perhaps they perceived themselves as masculine. Thus, being at risk of HIV might be considered as evidence of masculinity and of being sexually active. In other words, if an individual perceived his risk of HIV to be low, it might indicate he was not sexually competent.

On the other hand, women in Saudi Arabia experience gender inequality at all levels and thus experience various restrictions in their daily life activities. This might also discourage exposure to activities that lead to the risk of contracting HIV. Moreover, the Saudi cultural norm, which places huge importance on the virginity of women before they marry could also contribute to the low engagement of women in HIV risky behaviours such as unprotected sexual intercourse and multiple sexual partners. Interestingly, the present study recruited more women than men; this might be due to the adoption of an anonymous online self-administration method which may have encouraged women to participate.

In terms of differences across age, the findings of the present study were consistent with those of a previous study conducted by Anderson et al. (2007) which indicated that HIV risk perceptions differed significantly between age groups. Risk perceptions appeared to increase with age. This finding supports the concepts and theories concerning age and vulnerability which determine the perception of invulnerability as part of the development process. For example, egocentrism theory, offered by Elkind (1967, 1978), indicates that the risk-taking patterns of adolescents can be explained by their belief that they are immune to the natural law that affects others; however, as an individual matures, egocentrism decreases. Although the current research did not assess the participants' HIV high-risk behaviours, age differences could reflect variations in perceptions of actual risk. Another possible contextual explanation is that being a university student or secondary school graduate in Saudi Arabia comes almost at the beginning of experiencing a considerable amount of independence and autonomy. Consequently, exploring socio-

cultural taboo-labelled subjects, such as those related to sexuality, reflects that, as individuals mature, their ability to assess risk is enhanced.

While there is a good deal of literature on risk perception, an understanding of HIV/AIDS and general risk factors does not necessarily translate into perceiving accurate risk to oneself. In other words, an accurate perception of risk does not mean that a person acts to avoid that risk, but may choose risky behaviour in spite of it. As seen in Dokubo et al. (2014), one may not be willing to accept that one is at risk. Furthermore, risk perception and risk avoidance are different. Both Muchimba et al. (2013) and Osorio et al. (2015) identified a disparity between perceiving a risk of transmitting or contracting HIV and adjusting behaviour to prevent or mitigate that risk; this was also affirmed in the current study. In spite of the fact that the majority of the participants assessed their risk of contracting HIV above the average score, only a small proportion of the participants had previously been tested for HIV. Besides, an individual perceived his/her susceptibility to contracting HIV, the health belief model (HBM) pointed to other important components that played roles in the health-seeking behaviours of individuals. These components included: the individual's perception of the condition's severity; the individual's perception of the benefits of the preventive actions, such as HIV testing; and the individual's perception of the barriers to performing the preventive actions (Rosenstock et al., 1994). In addition, the HBM was modified to include other components which are cues to action. For example, doctors advise, self-efficacy and personal characteristics, such as demographic aspects.

6.3.4 Attitudes towards HIV testing

Throughout the literature, HIV testing is explored as a goal and as a starting point for HIV interventions. Once individuals are willing to come in and be tested, initiatives can be implemented to manage HIV, to avoid or delay the transition to AIDS, or to continue to prevent transmission in the case of an HIV-negative test result. This section discusses the

findings related to the attitudes toward HIV testing revealed by the study in relation to the existing body of research. This includes perceptions about HIV testing, attitudes as implied by the uptake of testing, and responses to available routine testing. The findings are discussed initially via each attitudinal component and the discussion then focuses on the overall attitude with regard to the HIV testing scores.

A. Confidentiality

In the context of HIV/AIDS, the international community has asserted the importance of implementing HIV testing services in such a way that it ensures that human rights are not violated (WHO, 2015). Confidentiality in relation to HIV health-related services has also been emphasised in the literature (Fortenberry et al., 2012). Specifically, a number of studies that were conducted to assess the low uptake of HIV testing have pointed to the importance of the confidentiality component in scaling up such testing. The present study found that confidentiality was also seen as a crucial aspect that increased young people's acceptance of HIV testing. The study findings concerning confidentiality were consistent with previously conducted studies. For example, a study conducted by Peralta et al. (2007) indicated that 53.7 percent of young adults aged 18-24 claimed that it would be easier to opt for HIV testing if they knew that the test would be kept confidential. In addition, Schnall et al. (2015) presented a model for understanding the HIV testing behaviours of younger populations and found that privacy concerns were barriers to undertaking the test. Concerns about the confidentiality of HIV testing programmes worldwide emphasised the exceptional characteristic of HIV/AIDS in comparison to other diseases. Stigma and its related components, such as shame, are believed to be one of the most important reasons for those at risk being reluctant to communicate their health status to others and seek medical advice (Badahdah, 2010). Moreover, in a strictly conservative country such as Saudi Arabia, it is not uncommon for the public still to regard HIV/AIDS as a disease of immorality and that those who are infected with HIV deserve it (Hasnain, 2005, Musso

et al., 2002). Consequently, although the findings of the present study concerning the confidentiality of HIV testing appeared consistent with the global trend, the socio-cultural setting of Saudi Arabia regarding STDs demands extra precautions to ensure confidentiality with regard to HIV testing services.

B. *Relationship matters*

The effect of interpersonal communication with parents and friends is recognised as one of the critical influences that has an impact on young people's attitudes, behaviours and decision-making processes (Namisi et al., 2009). DeJon et al. (2005) argued that in the Middle East and North Africa (MENA) region, young people do not receive adequate information about sex-related topics, either from their parents or their teachers. In addition, parents refrained from communicating and discussing such topics with their children, which was due to poor skills and information as well as cultural constraints (DeJong et al., 2005).

The findings of the present study show that discussing HIV testing with parents was a difficult task. This finding is congruent with studies conducted in Saudi Arabia and elsewhere. For example, Alquaiz et al. (2012) affirmed that only 15.8 percent of female secondary school students in Riyadh city discussed sex-related topics with their parents. However, the current study focused on child-parent discussions about HIV testing and not just on general discussion about sex related topics. In other words, the current study has shown that discussing the decision to undertake an HIV test, in particular with parents, is difficult.

It was also evident in the literature that young people in both developed and developing countries reported that their communication with their parents about sex-related topics was both insufficient and infrequent (Babalola, 2007, Namisi et al., 2009, Rosenthal and Feldman, 1999). In addition, in South Africa, Lebeso et al. (2010) claimed that poor

communication between parents and their children was one of the leading causes of the high level of sexually transmitted diseases, including HIV, among young people. Despite this agreement between the literature and the current study, the findings of this study have unique features. The current study clearly focused on the willingness of young people to discuss the decision to undertake an HIV test with their parents, not merely to discuss HIV or sexually-related topics in general.

This present study also identified uncertainty as a main reason for the participants feeling unsure with regard to whether their family and friends would support their decision to be tested for HIV. This finding affirmed the participants' reluctance to discuss sexual health related topics with family members and friends thus highlighting the strength of the widespread socio-cultural view in the Saudi Arabian context which suggests that it is not necessary to place emphasis on sexual reproductive health, particularly for unmarried individuals (DeJong et al., 2007). Although Islamic teachings include various principles related to sexual reproductive health, the prohibition of certain sexually related behaviours has been interpreted by religious leaders in a way that extends the taboo and stigma to health education concerning sex and reproduction. The literature clearly demonstrated the stigmatised view attached to HIV/AIDS in Saudi Arabia. For example, Al-Ghanim et al. (2005) found that 52 percent of the attendees at primary health care centres in Riyadh would end their friendship with an HIV-positive individual.

C. Fears

The current study explored various types of fear that were frequently indicated in the literature as barriers to the uptake of HIV testing. Although the most frequently cited type of fear that hindered such uptake was that of a positive result and unwanted consequences (Song et al., 2011, Dowson et al., 2012, Flowers et al., 2013, Mikolajczak et al., 2006, Mimiaga et al., 2007, Stolte et al., 2007, Mimiaga et al., 2009), 48 percent of the participants in the present study discounted the effect of this fear on their decision to be

tested for HIV. In addition, the fear that a positive result would lead to the individual being stigmatised was supported by 50.2 percent of the participants; this indicates that the participants' views were divided on this matter. This could be explained by the pressure of socio-cultural norms that stigmatise people living with HIV (PLWH) in Saudi Arabia. On the other hand, Islamic teachings emphasise the importance of being merciful and compassionate, especially with patients, regardless of the nature and the type of the disease they suffer from. Thus, these two contradictory views could be the reason behind the division over whether or not positive HIV test results would trigger stigma.

The stigma related to HIV in Saudi Arabia is clearly documented in the literature. Badahdah et al. (2010), for example, revealed strong and harsh attitudes towards PLWH among male university students in Saudi Arabia. For example, 59 percent of the participants in the study carried out by Badahdah et al. (2010) believed that PLWH should be isolated; 76 percent of them went on to suggest that their employers should terminate their employment. Although various types of fear have been identified as linked to HIV/AIDS worldwide, the close adherence to Sharia law by the Saudi government, which harshly penalises any individual practising HIV high risk behaviours, such as homosexuality, promiscuity and illicit drug use, made the fears related to HIV/AIDS in Saudi Arabia more prominent. Thus, such fear does not merely relate to the severity, prognosis or social consequences of HIV. Nonetheless, the legal penalties could have aggravated the fears encountered by individuals in the country.

D. Beliefs

The theory of reasoned action distinguishes beliefs from other components of models of behaviour, and these include attitudes, intentions, beliefs and behaviours (Ajzen and Fishbein, 1980, Fishbein and Middlestadt, 1989). This theory advocates that belief is a stimulatory factor that influences an individual's intention to practise a certain behaviour. The present study focused on certain beliefs that relate to how people judge those who

undertake HIV testing. Unexceptionally, despite the majority of the respondents being opposed to describing HIV-infected individuals as ‘disgusting’, they were supporters of the statements considering those who go for testing as ‘HIV infected’. This distinct response could highlight the influence of both Islamic principles and socio-cultural values on people’s beliefs, behaviours and attitudes. Islamic principles view disease as God’s decreed act and thus those who are affected should attract complete tolerance as for any other act of fate whether the outcomes are positive or negative. In addition, Muslims are instructed to show respect, love and compassion to others and refrain from humiliating, hurting and disgracing others because of issues concerning health, socio-economic standing or any other discriminatory status. On the other hand, Islamic teachings prohibit and harshly punish almost all HIV high-risk behaviours such as promiscuity, homosexuality and illicit drug use; this could strengthen the taboo and stigma attached to HIV/AIDS in Saudi society. However, the strict prohibition advocated by the Islamic religion is not meant to be a sign of approval concerning stigma and discrimination. In addition, Islamic teachings also prohibit contempt for any criminal or sinner, regardless of the type of sin. In other words, the stigma and discrimination attached with HIV/AIDS maybe induced by Islamic teachings but they do not have their roots in the Islamic religion. Therefore, it is not surprising that the findings of the current study affirm the role of socio-cultural pressure in shaping individuals’ stigmatising beliefs, which might in turn inform their attitudes and behaviours.

E. *Trust*

Trust is believed to be an important aspect in the provider-consumer relationship as it provides a basis for sustainable collaboration (Dwyer et al., 1987). Therefore, the service user needs to believe that the service provider will deliver what he/she is being offered in a harmless manner. The status of this relationship will influence whether the service user will utilise the service or not. However, the current study revealed that health care

providers were highly trusted by the participants in terms of keeping their test results confidential which was inconsistent with the findings of Hutchinson et al. (2004) who identified distrust as a major barrier to HIV testing. In addition, distrust of health care providers was also identified by Van Dyk and Van Dyk (2003) as a barrier to undertaking HIV testing in South Africa. On the other hand, Graham et al. (2013) found little or no evidence to support an association between trusting health care providers or health care systems, and a delayed diagnosis of HIV in the USA. The finding of the latter study with regard to the lack of association could be due to the small sample size. In spite of the fact that the literature lacks experimental studies which assess the impact of trust between health care providers and service users with regard to health outcomes, the literature underlines to a considerable degree the positive impact of trust between health care providers and service users on the health outcome, as well as its influence on an individual's decision to access and utilise the service (Calnan and Rowe, 2004).

In addition, it was apparent in the current study that, in spite of the fact that most of the participants trusted the health care providers, they were unsure whether the attitude of the health care providers would either encourage or discourage their testing decision. This finding could easily be linked to the very low uptake (only 5.5 percent) of HIV testing among the participants in the study. In other words, the majority of the participants in the current study would not be able to assess the role of health care providers' attitudes on their decision to be tested for HIV or not as they had never been tested for HIV.

F. Testing process

In terms of the testing process element of the scale assessing attitudes towards HIV testing, unawareness of HIV testing sites was the most remarkable finding. This was also confirmed as one of the most important reasons for not being tested for HIV indicated by the participants. Young people in the Balkans and the USA also said their lack of awareness of HIV testing centres was a barrier to undertaking an HIV test (Delva et al.,

2008, Payne et al., 2006). This finding demonstrates that awareness about HIV/AIDS should also include information about HIV services and their locations in order to assist individuals in their decision-making process. This finding was also supported by Babalola et al. (2007) who addressed the importance, not only of increasing the availability of HIV testing centres, but also of raising the public's level of knowledge about the availability of these services. Although health care services in Saudi Arabia are free for Saudi nationals, and 97 percent of the participants were Saudi, free HIV testing was agreed by a high proportion of the participants as a motivator for undertaking an HIV test. This finding suggests that the lack of familiarity with health care services is significant, in particular with regard to eligibility for free health care services.

❖ *Overall scores (the attitude towards HIV testing scale)*

The mean score of the scale assessing attitudes towards HIV testing in the current study suggested a reasonably supportive attitude among the participants. Similarly, Peltzer et al. (2004) indicated that university students in India, South Africa and the USA had a moderately favourable attitude toward HIV testing, although students from the USA held a more positive attitude towards HIV testing in comparison to those from India and South Africa. In addition, Kalichman and Simbayi (2003) assessed attitudes towards HIV testing in relation to HIV testing history in South Africa and found that those who had been tested for HIV and knew their status had a more positive attitude towards HIV testing than those who had not been tested.

The literature covering attitudes to HIV testing offers a wide array of responses depending upon the subpopulation and the manner in which the questions were asked. The attitude components and how they were assessed also appeared to be inconsistent. For example, Schnall et al. (2015) divided attitude into different components, which included perceptions regarding susceptibility to HIV, the severity of the disease, the benefits of HIV testing, and barriers to HIV testing. Schnall et al. (2015) found that attitudes

regarding the benefits seemed to be geared more towards not transmitting the infection to others. In addition, the perceived barriers that were identified included privacy concerns, the stigma associated with testing, and having to wait for results. On the other hand, Mtenga et al. (2015) evaluated attitudes towards HIV testing by asking about the perceived benefits, both generally and as outcomes for themselves, if the participants were to seek HIV testing. Moreover, the study asked about attitudes towards the benefits, including avoiding transmitting HIV to a spouse, living a happy life after receiving a negative test result, planning for the future, and seeking out antiretroviral therapy if the test for HIV was positive.

The findings of the current study could be explained by one of the core elements of cognitive theory which asserts the need to recognise that human beings are not always rational when they make decisions. The decision-making process is usually influenced by an individual's beliefs, experiences and cultural norms. Although the findings of this study demonstrated that attitudes towards HIV testing were reasonably positive, the majority of the participants had not undertaken the test. Accordingly, scaling up HIV testing requires multidisciplinary action, as attitude is just one piece of the picture. Public health interventions need to find a way to counter negative attitudes and encourage positive ones in order to persuade individuals to have regular and necessary HIV testing.

6.3.5 The relationship between HIV/AIDS knowledge and HIV risk perception

The literature on knowledge about HIV/AIDS and on the perception of risk, intersect. Some misconceptions about HIV/AIDS do not influence risk perception, while others fundamentally change the understanding of how HIV is transmitted and how it becomes AIDS, making the perception of the level of risk different.

Several of the studies identified in the literature concerning misconceptions about HIV/AIDS reveal similar types of misconception. First, many individuals are unable to

articulate a difference between HIV and AIDS. This could potentially influence their perception of risk as it is defined by understanding the severity of HIV and how it might be present in a healthy person. Second, there are a number of misconceptions concerning how HIV can and cannot be transmitted. This includes believing that mosquitoes and shared cutlery can spread an infection, but oral sex cannot. Knowledge of this topic, or a lack of it, can influence perception of risk about certain behaviours. Finally, some misconceptions have to do with prevention strategies. These can range from believing that washing the genitals after sex prevents infection, to not knowing that condoms are the best way to prevent infection. These types of misconception mean that the perception of how risk can be minimised and mitigated may be based on false premises.

The current study identified a positive relationship between HIV/AIDS-related knowledge and the participants' HIV risk perceptions. Thus, those who had better knowledge about HIV/AIDS revealed a higher degree of perception about the risk of contracting HIV. The association between HIV/AIDS knowledge and HIV perception has not been well documented in the literature. However, Prohaska et al. (1990) argued that factual knowledge about HIV/AIDS did not have an impact on an individual's perception of risk. They went on to assert that HIV risky behaviours are a determinant of the perception of risk. In addition, Auli et al. (2015) demonstrated that, even with a solid understanding of HIV/AIDS and a perception of risk that is based on fact, there are other variables that may be at play. For the individuals in that study (sex workers) there were financial pressures that led them to take a calculated risk, favouring the financial rewards of having sex without a condom over the relative safety of protected sexual intercourse. The failure of sex workers to use their knowledge to adopt preventive measures, such as using a condom to reduce their risk of contracting HIV, cannot be generalised to other high risk groups since the risky behaviours of sex workers are mainly driven by financial incentives.

Studies have also shown that there were other variables that influenced knowledge of HIV/AIDS. In particular, higher education was correlated with a greater knowledge level. Such increased knowledge can mitigate risk perception. As was found in Lan et al.(2014), public health officials could focus on misconceptions to seek out improved and more realistic risk perception. Beyond higher education status, there was little demonstrable proof that other variables would influence knowledge or risk perception.

Knowledge and risk perception have an interrelated relationship; however, other extrinsic factors could obscure this relationship. Knowledge, as well as misconceptions, informs the perception of risk so, depending on the specific fact or misconception, perception of risk may go up or down. However, the literature shows that other factors, such as financial incentives, may outweigh the impact of HIV/AIDS related knowledge on the perceptions of HIV risk. Public health officials should be aware of the effect of other factors that might affect the relationship between knowledge and risk perception. This awareness might then be used to control these other factors to combat HIV/AIDS.

6.3.6 The relationship between attitudes and the willingness to be tested

Attitudes are a key component of determining an individual's behaviour. There are other factors that can modify behaviour, including socio-demographic factors, the availability of the test from an existing health care provider, a change in sexual partners, and the perceived threat of HIV; all of these may play a role in determining how an attitude to HIV testing might translate into an individual actually having or avoiding an HIV test. According to the Theory of Reasoned Action (RA), an individual's intention to practise a certain behaviour (e.g., HIV testing) is determined by his/her positive attitude towards that behaviour and his/her belief about whether society would support this behaviour (Fisher and Fisher, 2000).

The current study explores the relationship between the attitudes towards HIV testing and HIV/AIDS-related knowledge, HIV risk perception and the willingness to be tested. However, the discussion mainly alludes to the willingness to be tested as the study revealed a statistically significant positive association between attitude and the willingness to be tested. In addition, the lack of association revealed by the current study between attitude toward HIV testing and HIV risk perception or HIV/AIDS related knowledge is also discussed. The findings of the current study show the existence of a positive relationship between attitude and the willingness to be tested. This is consistent with the work of Mtenga et al. (2015) which also affirmed this relationship. Mtenga et al. (2015) revealed that attitudes towards HIV testing had the strongest relationship with a willingness to seek out an HIV test; this was followed by perceived behavioural control among married individuals. Each improved score point for attitude resulted in a 7 percent increase in the odds of testing uptake. The findings of the current study, and those from Mtenga et al.'s work (2015), confirmed this positive relationship regardless of marital status.

It is also worth noting that the current study revealed no relationship between risk perception and the willingness to undertake an HIV test, showing the difference between risk perception and the intention to undertake protective action, such as HIV testing. In other words, as previously mentioned, human beings are not necessarily rational when making decisions so, even if an individual believes that he/she could be at risk of contracting HIV, he/she may decide to continue doing what puts him/her at risk. However, there is some evidence in the literature to show a positive relationship between the readiness or willingness to undertake an HIV test and the perception of the risk of contracting HIV (Babalola, 2007, Mbago, 2004). This could indicate that other factors might outweigh the impact of an individual's perception of his/her susceptibility on his/her positive response to that threat. In Saudi Arabia, socio-cultural norms relating to

sexuality could make an individual reluctant to undertake the HIV test. In addition, the legal system in the country criminalises and severely penalises (in some cases, the penalty is death) any individual who is proved to be engaged in any of the HIV high-risk behaviours. This could also make the decision to undertake an HIV test very challenging.

Asante (2014) studied the uptake of HIV testing among private university students in Ghana. In this study, the researcher noted that knowledge and understanding of HIV/AIDS and the HIV test were associated with a willingness to undergo the test. Specifically, knowing how HIV is transmitted, general HIV information, and where to get an HIV test, all correlated with a greater willingness to take a test in the future. This may be the result of knowledge informing attitudes towards HIV tests although the findings of the current study appear to be inconsistent with this notion. Specifically, the scores for knowledge related to HIV/AIDS did not correlate with either the scores for attitude toward HIV testing or the willingness to undertake HIV testing. The current study's findings concerning the individual's attitude toward HIV testing might be explained by the powerful effect of the socio-cultural factors and the legislation that condemns most HIV high-risk behaviours. These dominate the impact of other important factors such as HIV/AIDS related knowledge and an individual's perception of his/her own vulnerability to contract HIV.

Attitudes towards HIV testing are a critical element of public health interventions. The literature and the current study's findings demonstrate that knowledge can influence attitudes, either directly or by influencing risk perceptions, while attitudes can affect the willingness to be tested. Gender and age do not have a clear influence. There are numerous advantages to being tested for HIV. The literature demonstrates that these advantages are not necessarily understood or accepted by individuals but public health interventions may be able to communicate them. In doing so, more individuals,

particularly those at higher risk, might be willing to be tested and, if necessary, have treatment.

6.3.7 Quantitative findings: discussion summary

Although most of the quantitative findings proved to be concurrent with the literature, the Saudi Arabian socio-cultural context appeared to influence the participants' responses. The socio-cultural factors included those related to societal norms about sexuality, gender inequality, religious beliefs, and traditions. For example, the current study shows that misconceptions about HIV/AIDS are considerable in the population being studied. This could be linked to the societal refusal of sex education and weak political commitment to endorse legislation and initiatives to ensure access to information and health-related services in a non-threatening manner. The HIV risk perception scores demonstrate the societal norms in relation to gender as the male participants showed higher vulnerability compared to the female participants when it came to assessing their risk of contracting HIV. In terms of the attitude toward HIV testing, the findings of the current study illustrate the impact of socio-cultural factors on the participants' decision to undertake the HIV test. The findings clearly show that, in spite of the fact that the findings of the current study demonstrate a reasonably favourable attitude toward HIV testing, it did not translate into action as the majority of the participants had not previously been tested for HIV.

The current study shows a positive relationship between HIV-related knowledge and risk perceptions although the existence of this relationship was an area of controversy in the literature. However, the findings of the current study clearly demonstrate the effect of the socio-cultural setting on the findings. Thus, the current study highlights the importance of socio-cultural variations in the area of HIV/AIDS prevention.

6.4 Key findings (qualitative strand)

The following four themes were identified from the qualitative strand of the study: HIV testing facilitators, barriers to HIV testing, HIV/AIDS-related knowledge, and an action plan to increase the uptake of HIV testing among young people in Saudi Arabia. Each theme embraced a number of subthemes. The key findings that emerged from these themes and subthemes are later discussed in the light of the literature and incorporated with the findings from the quantitative strand.

6.4.1 Stigma as an overarching thought

Stigma related to HIV/AIDS was the most common subtheme agreed upon by the HIV/AIDS health care professionals who participated in the study as a barrier to young people undertaking HIV testing in Saudi Arabia. The pervasiveness of stigma as a major barrier to increasing HIV testing among various subgroups has been well documented in the literature worldwide. The literature concerning barriers to HIV testing has revealed that both developed and developing nations are affected by stigma. For example, studies conducted in sub-Saharan countries, which represent the greater part of the world affected by the epidemic, also suffered from social stigma (Njau et al., 2012, Njosing et al., 2010, Bwambale et al., 2008). In addition, despite the liberal values espoused by most Western societies, it was evident that stigma relating to HIV/AIDS is still challenging the efforts to combat HIV/AIDS, including those aimed at increasing the uptake of HIV testing (Lally et al., 2008, Lopez-Quintero et al., 2005, MacPhail et al., 2008, Nunn et al., 2012).

The literature concerning HIV/AIDS in the Middle East has also highlighted the impact of stigma on HIV/AIDS prevention programmes, hindering their progression (Abu-Raddad et al., 2010, Akala, 2005, DeJong and Mortagy, 2013). Although stigma related to HIV/AIDS is observed and acknowledged worldwide, it is understood that stigma is pervasive in countries dominated by Islam due to Islamic constraints on sexuality (Kaadan, 2004). The findings of this present study, as well as the literature, indicate that

Saudi Arabia is unexceptional in relation to stigma relating to HIV/AIDS. However, Badahdah (2010) argued that Saudi Arabia is a highly conservative country which adopts and follows a very strict interpretation of Islam. In addition, the perception that HIV is a 'moral' disease is widely accepted by Saudi society; this, in turn, translates into intense stigma and discrimination around HIV.

The HCPs who took part in this study also admitted that the stigma related to HIV/AIDS was commonly induced by health care providers, which made its impact much more critical in the Saudi Arabian context. For example, (Bnap) said:

“Make it confidential because you don't want to spread the rumour about because there are some doctors who don't want to treat or deal with HIV cases as there is a stigma from the health care facilities, all right!! There may be discrimination in how they deal with this patient; the respect level goes down, the care taken goes down.” (Bnap)

The literature showed that health care providers were engaged in activities which increased the level of stigma, including refusing to care for HIV- infected individuals, disclosing HIV status, prejudicing HIV patients, and adopting excessive precautions when caring for HIV-infected individuals (Rahmati-Najarkolaei et al., 2010, Reis et al., 2005). It has been argued that incompatible knowledge about HIV/AIDS among health care providers and a lack of awareness about the impact of stigma on the efforts to combat HIV/AIDS epidemics were the actual causes of stigma in health care settings (Nyblade et al., 2009). Memish et al. (2015) pinpointed poor HIV/AIDS-related knowledge among doctors in Saudi Arabia. In addition, Memish et al. (2015) study revealed a stigmatising attitude towards PLWH which was statistically significantly and predicted by a lower level of HIV/AIDS knowledge.

6.4.2 HIV/AIDS knowledge gap

Misconceptions about HIV/AIDS were prominent in the quantitative strand findings and were also central in the HCPs' accounts as barriers to HIV testing. The gap in HIV/AIDS-related knowledge among young people in Saudi Arabia has been well documented in the literature (AL-ALmaie, 2013, Badahdah, 2010). The literature also identified a lack of knowledge about HIV/AIDS as one of the main reasons contributing to the low uptake of HIV testing in various parts of the world (Ford et al., 2004, Lally et al., 2008, Mills et al., 2011, Njizing et al., 2010).

One of the HCPs also highlighted the importance of awareness of HIV health-related services, including HIV testing, to increase the uptake of the test. For example, (Bnap) said:

“It’s really by word of mouth and by a lot of awareness about the VCT centres we can get the number of uptakes to increase. For example, we received two people yesterday out of the blue. These were foreigners. They came and said we’ve heard and we want to get the test done and how we can get it done? They heard somebody talk about it and they came forward.” (Bnap)

This concept is supported in the literature as Babalola (2007) asserted that increasing public knowledge about HIV testing carried similar importance to increasing the availability of services.

The HCPs pointed out some potential reasons for the low level of knowledge among young people in Saudi Arabia. For example, Quotes from the interviews

“The lack of awareness campaigns that target young people mean a lot of people don’t have enough information about HIV. So, if something wrong happens, he/she starts to panic and doesn’t know what to do and where to go. This small thing could affect his/her entire life but if he/she has been educated about the disease or if he/she get the right information he/she could feel at ease.” (Gnap)

“I think there is a lack of proper awareness campaigns at all levels, such as the media and all its branches, educational institutes (schools, universities).” (Wanp)

“I also believe the way we tell the people also makes a difference.” (Bnap)

First and foremost, efforts to increase awareness about HIV/AIDS are still inadequate and need to be increased. As mentioned previously, general notions that sex education, including HIV/AIDS-related topics, could promote pre-marital sexual activities which are deemed unacceptable in the socio-cultural context of Saudi Arabia, hinder HIV awareness at all levels. It was also explained that the curricula of educational institutions, including those in schools and universities, lack sex-related topics, which has also contributed to a wide gap in HIV/AIDS knowledge. In addition, the HCPs interviewed claimed that even the awareness messages that are broadcast are often misleading and lacking transparency. This pattern of under-recognising the importance of HIV/AIDS awareness-raising efforts could also be due to socio-cultural constraints, as well as the low prevalence of HIV/AIDS in the country.

6.4.3 Test result and its consequences

Contrary to what was found in the quantitative strand of the study, fear of a positive result and its related consequences was inferred by HCPs as one of the main barriers young people encountered when deciding to be tested. For example, (Bnap) said:

“If they find out that they are HIV positive then what will happen? Then their family will know, they will lose their jobs and what if they’re married? What if the wife or the husband wants to leave? What will their friends say and how they will act? They think they will be outcast and isolated.” (Bnap)

Another example (Gnap) said:

“The fear of positive results could also count as a barrier to getting tested for HIV.” (Ganp)

The unwanted social, psychological and health-related consequences of a positive HIV test result have proved to be a crucial hindrance to HIV testing worldwide. Although most

of the respondents in the quantitative strand excluded the direct effect of the fear of a positive result as a deterrent to HIV testing, the social aspect of this fear in terms of stigma was apparent in their responses. Fear is a very powerful emotion in the context of HIV/AIDS and most such fears are closely related to the stigma attached to the disease. This could be attributed to the poor utilisation of HIV/AIDS health-related services. In addition, certain misconceptions, for instance, labelling HIV as a death sentence, have also contributed to the denial of risk and the avoidance of preventive measures, including HIV testing (Fagan et al., 2010, Spielberg et al., 2001).

6.4.4 Steps toward scaling up the uptake of HIV testing

The HCPs also recommended various actions to enhance the uptake of HIV testing by young people. These actions were related to increasing the level of awareness about HIV/AIDS and optimising the current HIV testing services. For example, Quotes from the interviews

“It is also important to prepare and distribute leaflets and brochures that contain very clear information about HIV/AIDS and the VCT services.” (Gnap)

“It’s really by word of mouth and by a lot of awareness about the VCT centres we can get the number of uptakes to increase. For example, we received two people yesterday out of the blue. Those were foreigners. They came and said we’ve heard and we want to get the test done and know how we can get it done. They heard somebody talking about it and they came forward.” (Bnap)

“It’s also important to include AIDS and other STDs in school curriculums so, this will help young people know the right information from trusted sources.” (Gnap)

“It is also noted that stigma is affecting our service because people don’t want to walk into our department so I think, if we could make the clinic for sexually transmitted diseases in general and HIV testing is one of them, it would help a lot.” (Wnap)

“If we have it in more places which are not in health related centres that will dramatically increase the uptake.” (Bnap)

As observed in the quantitative strand of the study, the level of HIV/AIDS related knowledge was noticeably low. In addition, as aforementioned, the gap in knowledge related to HIV/AIDS was believed to be a contributory factor in the low uptake of HIV testing by HCPs. The HCPs advocated the implementation of comprehensive HIV/AIDS education programmes to eradicate the misconceptions, as well as to reduce behavioural risk factors among young people in the country. This advocacy was also highlighted in a review conducted by Kirby et al. (2005) to evaluate the sex and HIV education programmes across the globe. Kirby et al. (2005) argued that sex and HIV education programmes were more likely to have a positive impact on risky behaviours. Moreover, the existing sex and HIV education programmes were revealed to be insufficient by HCPs as they stipulated the need to tailor the awareness messages more effectively if they were to be comprehensive and accurate. This demand was also supported by Bearinger et al. (2007) who stated that offering accurate information and improving interpersonal communication skills should feature in any sex education programme. Furthermore, the HCPs in the current study suggested that information on HIV/AIDS and other STDs needed to be integrated into schools' curricula as this would build young people's knowledge, as well as increase their awareness from an early age. This notion was also supported by the review of Kirby and Laris (2009) who concluded that curriculum-based sex education programmes had significantly impacted on young people's behaviours. These influences on young people's behaviours included postponing the initiation of sexual intercourse, reducing the number of sexual partners, and increasing the use of condoms (Kirby and Laris, 2009).

In term of enhancing the existing HIV testing services, the HCPs in the current study were convinced that the name and the services needed to be modified in order to increase the

uptake of the HIV test among young people. For example, the HIV testing service should be incorporated into the broader service that operates counselling and testing, not only for HIV, but for all other STDs. A study conducted by Campos-Outcalt et al. (2006) to assess the effectiveness of integrating HIV testing with other testing for STDs showed considerable improvement in the HIV testing uptake when this occurred. In addition, the HCPs in the current study believed that this modification would reduce the impact of stigma attached to HIV/AIDS which would again, in turn, increase the uptake of HIV testing. A study conducted in China to evaluate the integration of Syphilis/HIV testing in STI clinics found that such integration considerably increased the uptake of HIV testing in comparison to the traditional VCT centres which offered HIV testing alone (Tucker et al., 2012). Tucker et al. (2012) underlined the importance of understanding the social context of HIV testing in order to establish the effective integration of HIV testing into routine clinical practice.

The HCPs also highlighted the need to develop VCT centres which were dedicated to young people as these would be much more acceptable to young people than the traditional VCT centres which serve various groups in the community. The need for special services devoted to young people or the establishment of youth-friendly HIV testing services has been demonstrated in different parts of the world. For example, two different studies were conducted in the USA and Sweden to investigate the barriers faced by young people in undertaking HIV testing. These studies found that a lack of HIV testing facilities specifically for young people contributed to the low uptake of HIV testing (Christianson et al., 2010, MacPhail et al., 2008). On the other hand, a discouraging inference was revealed in a systemic review conducted to assess the effectiveness of youth centres in increasing the uptake of sexual health services by young people (Zuurmond et al., 2012). The review showed that the utilisation of these kinds of service was low; it also demonstrated the low cost-effectiveness of such services

(Zuurmond et al., 2012). In a country like Saudi Arabia, where the prevalence of HIV is amongst the lowest worldwide, establishing HIV testing services designated for young people seems an unnecessary resource-intensive action. However, initiatives to spread awareness about HIV/AIDS and the available HIV/AIDS health-related services, including HIV testing, are more feasible and could be cost-effective measures. In addition, it would be helpful if the existing VCT clinics adopted a youth-friendly environment.

The role of Mobile Voluntary Counselling and Testing (MVCT) in increasing the uptake of HIV testing by young people was emphasised by the HCPs in the current study. The HCPs suggested that establishing additional MVCT units would increase the uptake of HIV testing by young people. This suggestion has proved to be valid in other parts of the world. For instance, in Kenya, MVCT units proved to be effective in attracting young people to undertake the HIV test (Grabbe et al., 2010). The efficiency of MVCT in comparison to home voluntary counselling and testing (HVCT) in increasing the uptake of HIV testing among young people was also demonstrated in a study conducted in South Africa (Maheswaran et al., 2012). In addition, Maheswaran et al. (2012) found that MVCT users were generally younger than 25 years, were single, and had never been tested for HIV.

6.5 Making sense of the findings from both strands

The main purpose for using a combination of quantitative and qualitative methods was to explain the quantitative data set and enhance understanding regarding the situation in Saudi Arabia about the utilisation of HIV testing services. Although the qualitative data were gathered from only three interviews, these were helpful in understanding what was behind the numerical data. In addition, the number of interviewees in the current study was quite an achievement in Saudi Arabia where staff may be very reluctant for their views to be published in a thesis, especially for highly sensitive topic such as HIV/AIDS. The interviewees also offered another perspective to the main question of the study, as

well as providing an action plan to increase the uptake of HIV testing by young people in Saudi Arabia.

It was clearly indicated by the questionnaire findings that HIV/AIDS related knowledge was low among the participants, regardless of their gender. The interviews with HCPs also revealed that misconceptions about HIV/AIDS are the main reason for the low uptake of HIV tests among young people in the country. The interviews also showed that knowledge about HIV/AIDS needs to be improved to ensure that individuals have an adequate amount of information to inform their decision-making. Knowledge about and awareness of the mode of transmission and preventive strategies alone were not enough to make an individual capable of making the decision to undertake the HIV test. It was shown in the interviews that knowing the locations of the testing centres and the procedures, as well as the nature of the services (e.g. anonymous or confidential), had a positive influence on an individual's decision to undertake the HIV test.

The responses of the participants to the questionnaire clearly showed the effect of stigma on the uptake of HIV testing. Various responses in the attitude section of the questionnaire revealed that stigma has a real influence on an individual's decision to undertake the HIV test. Similarly, the HCPs argued in the interviews that stigma is a major barrier faced by individuals in Saudi Arabia to seeking HIV testing. In addition, the HCPs suggested that the impact of stigma has been intensified by the stigmatised attitudes and behaviours of HCPs. Although the stigma related to HIV/AIDS is a worldwide challenge, in Saudi Arabia, the impact of stigma appears to be much more challenging as it is constrained by societal norms and beliefs.

In spite of the fact that all the participants in the quantitative strand of the study were university students, the low level of knowledge was apparent. The HCPs urged that the first step to scale up the uptake of HIV testing would be to raise the awareness level

concerning HIV/AIDS, targeting young people. The HCPs claimed that the low level of HIV/AIDS related knowledge was due to the lack of adequate HIV/AIDS awareness campaigns since the awareness messages delivered were rather inexplicit. The HCPs also argued that the lack of curriculum-based sex education, including that related to sexually transmitted diseases, also contributed to the low level of knowledge among young people in the country. All these factors have led to a gap in HIV/AIDS related knowledge among young people in Saudi Arabia and this, added to the powerful socio-cultural constraints and the paucity of political commitment, hinder efforts to increase the level of awareness about HIV/AIDS and other sexually transmitted diseases.

Although fear of a positive result and its related unwanted consequences was not distinctly revealed by the participants in the quantitative strands, some responses across the questionnaire showed its apparent impact on individuals' decision to undertake the HIV test. HCPs claimed that, without doubt, this type of fear was one of the main barriers which impacted on an individual's decision making process in terms of undertaking the HIV test.

The HCPs also offered an insight into certain measures that would increase the level of HIV testing uptake in the country. For example, as the low level of HIV/AIDS related knowledge was evident from the questionnaire findings, the HCPs stressed the need to raise HIV/AIDS awareness in order to increase the uptake of HIV testing.

In the following section, the study findings are articulated together with the existing theoretical frameworks in order to make sense of the study as a whole.

6.5.1 Theoretical inferences in relation to the study's findings

Since the beginning of the era in which HIV/AIDS has become endemic, a number of conceptual and theoretical frameworks have been developed and applied in order to understand HIV risk behaviours, as well as to predict the behavioural changes associated

with them. Some of these frameworks, for example, the AIDS Risk Reduction Model (ARRM), have been specifically designed for HIV/AIDS whereas others, such as the Health Behavioural Change Model and the Health Belief Model (HBM), have been widely used for a number of health-related behaviours. Three frameworks were shown to be linked to the current study findings. These are: The Health Belief Model (HBM), Theory of Reasoned Action, and the Theory of Planned Behaviour.

In terms of HBM, the fundamental aspects of this model lie within the individual's perceptions of susceptibility, severity, vulnerability, benefits and cost. Additionally, a cue stimulus and self-efficacy have been added to the original HBM; these aspects are believed to be helpful in promoting the behaviour undergoing the process of change (Fisher and Fisher, 2000). The study findings validate the criticism of HBM: that HIV risk behavioural change is a complex issue which requires other fundamental components such as social support, behavioural skills and HIV/AIDS related knowledge in order to promote the behavioural change. Specifically, the study revealed that the participants generally perceived their HIV risk to be moderate to high. In addition, a significant cluster of the participants were misinformed about the severity of HIV and most seemed uncertain whether or not they would voluntarily seek HIV testing in the future. Moreover, it was also obvious that socio-cultural constraints (e.g. stigma and taboo) surrounding HIV/AIDS had an unfavourable effect on the participants' attitudes toward HIV testing. Thus, the complexity of HIV/AIDS preventions makes it challenging to understand and predict behavioural change using the HBM. It is clear that HIV/AIDS preventive behavioural change requires a multidimensional as well as a contextual approach. HBM could enhance our understanding of HIV preventive behaviours in a given population but, in order to gain a comprehensive understanding, a more complex approach is required.

For a better understanding of the study's findings in the light of the theories, two interrelated theories can be used: namely the Theory of Reasoned Action (TRA) and the

Theory of Planned Behaviour (TPB), the latter being acknowledged as an extension of the TRA (Ajzen and Fishbein, 1980, Fishbein and Ajzen, 1977, Ajzen, 1991). Both theories offer frameworks to predict, understand and change behaviours which are influenced by psychological elements, such as those related to HIV/AIDS preventive behaviours, including HIV testing. The two theories share the same fundamental assumptions which are centred on an individual's intentions to perform the behavioural act in question. However, the individual's attitude toward the behaviour and the individual's subjective norms determine his/her intentions to perform the act. The only difference between the two theories is that, in the TPB, an additional construct, namely, perceived behavioural control, has been added to the original TRA constructs of intention, attitude and subjective norms. Ajzen (1991) claimed that adding the perceived behavioural control construct would enhance the ability of the model to predict, understand and change the behaviour in question.

TRA and TPB facilitate an understanding of the psychological factors that influence an individual's performance of preventive behaviours such as HIV testing. According to the theories, the individual's beliefs about the outcomes of the behaviour determine his/her attitude toward the behaviour whereas the individual's perception of whether he/she will receive social support to perform the behaviour is a determinant of the individual's subjective norms. Specifically, the findings of the study, in terms of the attitude toward HIV testing, revealed reasonably positive attitudes across genders. It was also clear in the relationship section, which concerned the support of family and friends, that nearly half of the participants seemed uncertain whether or not their family would support their decision to seek HIV testing. In addition, nearly half of the participants considered that their decision to undertake the HIV test would upset their parents. The intention to seek HIV testing was also characterised generally by uncertainty. Thus, it is clear that even though the attitude was reasonably favourable, socio-cultural support seems

unsatisfactory; this, in turn, diminishes the individual's intention to undertake the HIV test. Accordingly, the effectiveness of the TRA model in enriching the understanding of the HIV testing behaviour of young people in Saudi Arabia seems to be supported by the study data. However, other external constructs, such as HIV risk perception and demographic variances, could have either a direct influence on HIV testing seeking behaviour or an indirect effect through attitude and subjective norms.

On the other hand, the impact of the TPB's additional construct (perceived behavioural control) on HIV testing seeking behaviour was also corroborated by the study's findings which show that the decision to undertake an HIV test is not an easy one. Socio-cultural constraints, such as those related to stigma, shame and taboo, clearly promote ignorance of the risk and inform an individual's lack of control over his/her HIV test seeking behaviour. In addition, insufficient information, such as details of HIV testing locations and the process of HIV testing, has also led participants to lack confidence with regard to their ability to control their HIV testing seeking behaviour. It was further noted that a great number of participants believed that what had made them never previously undertake an HIV test was that no one had offered or requested them to get tested for HIV; this again shows the inadequacy of the ability to control testing behaviour. Moreover, certain cultural issues emerged in terms of gender power inequalities, such as the inability of women in the Saudi culture to travel or to make decisions freely about various aspects of their daily lives, including those related to medical procedures. Consequently, young people in Saudi Arabia perhaps retain inadequate control over their HIV test seeking behaviour. This lack of ability to control their HIV testing behaviour contributed to the low level of HIV testing among young people in Saudi Arabia, either through the direct effect of poor behavioural control or the indirect effect that influenced attitudes or normative beliefs.

The following part of the discussion addresses the quality of the research and the measures adopted to ensure the quality of the evidence that emerged from the study.

6.6 Addressing the quality of the findings

In this part of the discussion the quality of the findings from both strands of the study is discussed in the light of the literature. The debate around the guidelines and the criteria are also considered.

6.6.1 The quality of the quantitative findings

In terms of the quality of the quantitative findings, the tools used to collect the data and measure the three different constructs (namely, HIV/AIDS related knowledge, HIV risk perception and the attitude toward HIV testing), were assessed for their reliability and validity. Reliability refers to the ability of the measurement to produce stable and constant results each time the measurement is used and by whoever is measuring (Bannigan and Watson, 2009). The concept of reliability is an essential aspect to assess the amount of error produced by any measurement, whether this is a random or systematic error (Streiner et al., 2014). The reliability of the scale was assessed using a test/retest reliability strategy in which a sample from the study population was recruited to complete the questionnaire on two occasions. In addition, validity refers to the ability of the tool to measure what it has been developed to measure. The meanings of the scale and the construct being measured are what validity assessment reflects on (Bannigan and Watson, 2009). The questionnaire development process includes assessing the content's validity. Five experts in the field of HIV/AIDS rated the items included in the questionnaire for their relevance to the construct being measured; this determines if the questionnaire's content are valid. Although this validity assessment is insufficient to assess the construct validity of the instrument, it provides evidence that it is valid for the purpose of the research and the population under study. The construct validation of any instrument is an

endless and continuous task to assess the instrument's performance in various settings and across different populations (Streiner et al., 2014).

6.6.2 The quality of the qualitative findings

Assessing the quality of qualitative research has always been a controversial topic. Despite the long-standing debate around the issue of quality in qualitative research, it seems that it is nigh impossible to reach a consensus on quality criteria for qualitative research (Sandelowski and Barroso, 2002). The lack of consensus about the quality criteria that can be used to judge qualitative research, and the arguments around the need to assess the quality of qualitative research, are part of the wide philosophical debate about reality. Those who are purely relativist argue that it is not necessary to reflect on the rigour of qualitative research. On the other hand, others underscore the need to ensure rigour in qualitative research and assert that attempts should be made to show that social worlds have some constant value (Wainwright and Forbes, 2000). Hope and Waterman (2003) attempted to summarise the three different stances of the scholars on this debate. The first camp adopted positivist paradigm criteria whereas the second developed distinct criteria to assess qualitative research; the third camp rejected both sets of predetermined criteria of validation.

Hammersley (2013) argued that assessing qualitative data for truth or falsity depends on the aims and objectives of the research. If the research's aim is to seek an understanding of a particular social context, or to explain this context and the perspectives of different actors, then the need to assess the validity is not essential. On the other hand, if the data generated from the study are used as a source of information about a particular social context, then it is important that the 'truth' of the account is safeguarded. Hence, the main purpose of the qualitative strand of the current study was to explore the perspectives of HCPs about the factors that influenced young people's behaviour in terms of HIV seeking

testing in Saudi Arabia. Moreover, the HCPs' accounts were considered a source of information and therefore, it was necessary to confront the issue of 'truth'.

A. *Credibility*

Credibility in qualitative research is comparable to internal validity in the positivist stance. However, it is concerned with the extent of reality embedded in the study findings. Lincoln and Guba (1985) argued that the single most important aspect of the trustworthiness of a qualitative study is credibility. In addition, they underscored the importance of member checking as a crucial method to establish credibility in qualitative research (Lincoln and Guba, 1985). On the other hand, scholars such as Sandelowski (1993) argued that, according to the philosophy behind qualitative inquiry, which asserts that reality is 'multiple and constructed', member checking or respondent validation are not necessary to ensure the credibility of the data. Hammersley (2013) also criticised the use of respondent validation as an assessment tool for credibility. As reality is seen as multiple and relative, it is not to be expected that two researchers, no matter how expert they are, would reach the same set of codes, themes and categories. Similarly, respondents might agree or disagree with a researcher about the findings of a study. Respondent validation also neglects the fundamental nature of the relationship between a researcher and respondents as it indicates that the truth is accessible through the respondents alone. As mentioned previously, the member checking strategy to assess credibility is clearly questionable in terms of both the assumptions behind it and its relevance. The researcher in the current study did not apply this strategy for the quality assessment of the qualitative findings. Instead, 'triangulation' strategy, which is one of the most common practicable strategies to ensure the credibility of data, were embedded in the study design. Safeguarding the data's credibility using triangulation strategy occurs when the researcher combines two or more methods of data collection. Patton (1999) described four types of triangulation that could be used to enhance the quality and the credibility of

the data: methods triangulation, triangulation of sources, analyst triangulation and theory triangulation. It has been argued that adopting different methods for data collection provides a clear and complete picture of the research problem under study which is difficult to achieve using a single method (Guba, 1981). Although different data sources or approaches may yield somewhat different results, Patton (1999) asserted that triangulation is mainly used to assess consistency between the findings of the different approaches. Additionally, it offers in-depth understanding of the relationship between different approaches and the problem under study. However, opponents of this strategy to assess the quality of data, such as Silverman (2006), argued that utilising such a strategy is misleading as it suggests that there is one overarching reality.

The current study did not seek to reveal one single reality but rather to explore and describe the problem through various perspectives and accounts. It sought to do this by using a quantitative approach via the questionnaire and a qualitative approach in the form of the semi-structured interviews across different settings and contexts. For example, the questionnaire was used to assess the factors that influenced young people's behaviours in terms of seeking HIV testing whereas the interviews were conducted to explain the questionnaire results, as well as to explore the issue from the HCPs perspectives. Thus, the two different data sets facilitated the exploration of the issue under study from different perspectives. Although there were some inconsistencies between the two sets of findings, the key issues revealed from both sets were consistent. As a result, the degree of convergence between both data sets strengthened the claim of the credibility of the data.

B. Confirmability

In their classic work "Naturalistic Inquiry", Lincoln and Guba (1985) asserted the importance of "Confirmability" in the assessment of a qualitative inquiry. Confirmability refers to the trustworthiness of the data analysis and is mainly concerned with the

existence of the findings in a respondent's account and not those induced by the investigator's preconceptions. Various strategies exist in the literature to ensure confirmability of the findings. However, the current research ensured confirmability through the use of a second researcher who was thoroughly engaged in the process of the data analysis so an agreement about the themes and categories could be achieved. The role of the second researcher was to ensure that the codes, themes and categories emerged from the data. Thus, in the current study, both supervisors read the interview transcripts and proposed various approaches to the data analysis techniques. They also commented on the initial polls of codes, themes and categories, and recommended certain refinements of the codes. The final set of codes, themes and categories was discussed in a meeting with both supervisors and, at this time, codes were assigned to the transcripts which were presented in the findings chapters. This process allowed both the student investigator and the supervisors to be more confident that the analysis was genuinely developed by the respondents' accounts.

C. Reflexivity

Mays and Pope (1995) underscored the importance of being "self-conscious" in each stage of the research process in order to ensure rigour. This process is widely known as 'Reflexivity' and it requires the researcher to articulate his/her preconceptions, experience and the research environment that might influence any aspect of the research from the topic selection right up until the end of the research. Lamb and Huttlinger (1989) defined reflexivity as "*a self-awareness and an awareness of the relationship between the investigator and the research environment*". In addition, Alvesson and Skoldberg (2000) stated, "*Reflection means thinking about all the conditions for what one is doing, investigating the way in which the theoretical, cultural and political context of individual and intellectual involvement affects interaction with whatever is being researched*" (p. 245). In the current study, like most of the studies concerned with participants' beliefs,

attitudes and feelings, the researcher could not always maintain his/her objective position and therefore, the subjective position of the researcher needs to be acknowledged. Therefore, this part of the quality assessment is dedicated to reflect on the researcher's beliefs and assumptions, as well as to acknowledge the role of the interactions between various actors within the research process, including respondents, supervisors and the general public.

❖ *Topic selection process*

The curiosity about HIV/AIDS started when the researcher was completing a medical internship in a general surgery department. The social discrimination against those infected with HIV was apparent in Saudi Arabia, even in the healthcare setting. For example, some healthcare providers tried to avoid handling individuals infected with HIV and often had to be forced to handle such cases. Thus, throughout the internship year various situations demonstrated that HIV/AIDS patients were stigmatised just because they had contracted the disease. However, other diseases, such as hepatitis, which could also be transmitted in a similar way to HIV, were much more easily tolerated in Saudi society. Then, while the researcher was studying for a Master's degree in public health, HIV/AIDS appeared to capture global attention and was prioritised at different levels, such as in the Millennium Development Goals (MDGs), as well as the commission developed by the UN especially for HIV/AIDS; this was called UNAIDS. At that time it was obvious that Saudi Arabia and many other countries in the MENA region did not invest appropriately, as was necessary, in order to tackle the spread of HIV/AIDS. Instead, they applied ready-made plans that did not consider the exceptional socio-cultural setting of these countries. Thus, these plans failed to address HIV/AIDS problems and rather perhaps led to the ongoing increase in the incidence and prevalence of HIV in the region. The literature concerning HIV/AIDS in Saudi Arabia that is available seems insufficient to inform and allow policy makers to design an effective preventive programme to combat

the spread of HIV in the country. There and then, the researcher set himself the goal to make a difference, enhance the overall picture, and clear the ambiguity attached to HIV/AIDS in Saudi Arabia. Thus, the crucial initial step to achieve this goal was to carry out research which would provide information based on empirical evidence to fill the gap in the literature in order to inform policy and practice. Consequently, the researcher decided to obtain a PhD in the field of HIV/AIDS in Saudi Arabia.

Although the parents and wife of the researcher are among the few who support him most in all aspects of his life, at the beginning of his PhD study they could not understand the reason behind choosing such a topic. Moreover, they attempted to convince him to change the topic as they felt he would be at risk of contracting HIV and also felt this decision might affect his future life socially, especially in Saudi Arabia. It therefore appeared that even the researcher's own family was no different in terms of discriminating against and stigmatising those connected with HIV/AIDS in general. He then felt that it was a challenging mission but that he needed to be very careful when designing the study. The researcher became aware that he must take extra care to ensure that the study would be less sensitive, non-judgmental and appropriate to the Saudi Arabia socio-cultural setting.

❖ *Supervisory team issues*

The cultural difference between the student researcher and the supervisors seemed to be an important aspect that concerned him even before the study began. Culture is comprised of almost unlimited elements which include language, history, religion, morals, etc. so it seemed that communicating and interacting with supervisors in general, and especially in relation to the topic of the study which was culture-specific, would not be an easy task. However, this struggle lasted only a few months from the beginning of the study as it mainly concerned understanding, interpreting and expressing thoughts; this improved with effective communication and trust among all the parties. In addition, issues of cultural diversity that influenced the study topic directly, such as those related to gender

power differentials, socio-cultural values, religious beliefs and legal systems, also preoccupied the researcher's thoughts. Therefore, the researcher attempted to resolve these issues with acceptance, understanding and non-judgemental behaviour. He also tried to express different cultural values in a coherent manner so that each member of the team had a clear picture of these cultural differences in his mind.

The researcher also faced a challenging situation with regard to positioning himself in the research team as a partner, not as subservient. This issue was due to his relative lack of research experience, as well as his social background which recommended viewing the teacher or mentor as at a higher level. However, in a PhD study, this is not the case as the PhD student is required to make and defend decisions, and is supposed to lead and take full responsibility for his/her research. Although both supervisors always reminded the researcher that the research was his work and their job was to advise rather than to lead, it was a very difficult task to take on that role. In order to overcome this problem, the supervisors encouraged the researcher in the supervisory meetings to lead the discussion and suggest solutions to the problems that were arising during the course of the study. These strategies helped the researcher to move away from the subordinate role where he first positioned himself and also enhanced his confidence.

❖ *Interaction with the participants*

In the study design stage, the researcher's thoughts were influenced by the perception that he would struggle to recruit female participants, even though the questionnaire was self-completed anonymously. The researcher's concerns were due to the fact that HIV/AIDS is highly stigmatised in Saudi Arabia. Face-to-face interviews with individuals of the opposite gender are also problematic in a Saudi Arabian socio-cultural setting as strict gender separation is closely observed and maintained by the Saudi religious police. All these cultural issues could have influenced the course of this study; however, the number of female participants exceeded the number of males. In addition, in term of the

interviews, the female HCPs were much more passionate about the research and were fully engaged in the interviews, making generous responses compared to their male counterparts. Moreover, the researcher received many enquiries regarding the questionnaire, as well as the HIV testing services, from female participants whereas not one enquiry was received from a male participant.

The researcher found that, in the data collection stage, collecting the quantitative data were less stressful as this phase was conducted in an online virtual environment. However, the qualitative data collection was the most stressful part of the whole data collection process. The researcher approached potential participants for the qualitative strand of the study and explained the purpose, aims and objectives of the research project. Most of those being approached expressed their full support and willingness to take part in the study but, when the researcher attempted to schedule appointments for the interview, most of them either refused to participate or did not reply at all. Furthermore, the time designated for the data collection was limited which might have made this problem worse. The fact that those approached to take part in the study were working in the field might suggest that some of them thought that taking part in this research project would take them out of their comfort zone or might challenge their practices. In addition, the socio-cultural norms with regard to interviewing an individual of the opposite gender could have had an impact on the decision of some of the eligible females to reject the invitation to participate in the study.

During the interviews it seemed that both the researcher and the interviewees were in harmony which might be the result of the shared beliefs, culture, language and professional background. It was easy to understand gestures, facial expressions, metaphors and examples. However, during the interviews, interviewees sometimes tried indirectly to defend their practice which was difficult for the researcher to challenge during the interview. This defence mechanism, which some interviewees adopted at some

point in some of the interviews, could be due to their concerns about their manager's reaction if he/she knew that an employee had criticised the institution or its policy. This fear is actually built into the socio-cultural system of Saudi society which, most of the time, is not realistic. However, in the absence of a solid, system-based approach in most developing countries, people fear that they might meet abuse from their employers.

Following the data collection phase, several questions arose regarding the participants' responses and motivations, with the researcher wondering whether those who completed the questionnaire were motivated by their interest in HIV/AIDS in general or whether this interest was influenced by their perception of risky or actual behaviours. In addition, he asked himself if the numbers reflected the situation in Saudi Arabia or if what the interviewees said truly explained the situation based on HCP experience. The researcher found that it was not always possible to maintain complete objectivity, especially because he belonged to the same socio-cultural background as the participants. Thus, in order to minimise the effect of the researcher bias, it was fundamental to apply systematic coherent data analysis techniques.

❖ *HIV testing service*

Once the PhD journey had started, the researcher began to look for those factors which influenced individuals to undertake the HIV test globally. He noticed that HIV testing was mainly influenced by the attitudes of the individual and the provider, as well as socio-cultural norms. In addition, matters relating to logistics and policy also had an impact on the uptake of the HIV test. Following an extensive literature search, the researcher began to wonder what it would feel like to undertake the HIV test voluntarily. He also felt somewhat afraid and wondered, if he decided to be tested for HIV, how this would impact on his life and whether it would have an impact on his relationship with others, such as family members and friends. In addition, he was concerned about how he would be treated by the staff at the testing centre. There and then he decided to step forward and live the

experience that he wished to study. Thus, at the beginning of his journey to collect data for his research project, he went to a testing centre, not to collect data, but to be tested for HIV. Although the researcher had been tested for HIV prior to his marriage as part of the mandatory pre-marital medical test, going to an HIV testing centre was a completely different experience. From this experience the researcher recognised many defects in both his perception and in the HIV testing centre. For example, he understood how it felt to be tested for HIV, together with all the fears of being spotted at the centre or seeing someone he knew there. It was a stressful experience for the researcher and all the social outcomes that related to stigma, discrimination and loneliness ran through his mind. On the other hand, the researcher also experienced some difficulties in locating the HIV testing centre and even when he contacted the information department at the Ministry of Health, they could not help him. The researcher also felt that walking into the HIV testing centre could not protect his identity from being exposed to others as the HIV testing centre was located in the middle of a building which included other health-related facilities. Following this experience, the researcher obtained a clearer picture of HIV testing from a service user's perspective; this certainly had an impact on his interpretation of the study's findings.

In the following sections, the reflective account concerning the methodological critique at different stages of the study is discussed thoroughly.

6.7 Methodological critiques

In this section, the study is critically and systematically appraised. Each stage of the research is assessed and reflected on and potential future enhancement measures are highlighted.

6.7.1 Study design

The questionnaire was developed in the light of the literature and the items were selected solely by the student investigator to ensure that they were not too sensitive for the population under study. This item selection process can result in neglecting certain items

that it might be worth including. An assistant from Saudi Arabia helped in assessing what was an acceptable level of sensitivity as far as the population under study was concerned. The constructed questionnaire was assessed by five experts, three of whom were from Saudi Arabia in the field of HIV/AIDS, for its content validity. In the future, it might be valuable to gather information about risky behaviours, as well as those related to sexual orientations, if the authorities in Saudi Arabia wish to be more open about such issues as this would help in focusing the efforts to tackle the disease in the country.

6.7.2 Data collection

As the study was conducted in Saudi Arabia, and because of the long process required to obtain ethical approval and permission to collect data, the investigator was only able to travel to Saudi Arabia to collect the data in the summer of 2014. Thus, besides the use of a convenience sample, the data collection had several limitations. During the test/re-test reliability assessment it was previously planned to recruit 50 participants to complete the questionnaire twice. However, 24 participants did not complete the questionnaire in the second wave which might have been due to loss of interest or they might have been away on their summer vacation. In the main stage of the questionnaire data collection, it was also difficult to achieve suitable quotas for gender and age; this was the result of the summer holiday. Instead, the only criteria for collecting the data were that the participants were students aged 17-25 years who attended Umm Al-Qura University. Consequently, the majority of the participants were female although the number of male participants was sufficient to sustain the statistical analysis to compare the genders.

Moreover, it was also noticed that a number of the participants did not complete all the sections of the questionnaire which might have been due to the length of the questionnaire. It seems that those who chose to abandon their participation might have become bored by completing such a long questionnaire. Furthermore, because of the sensitivity of the research topic, some potential participants might have preferred not to take part in the

study. Such limitations are an almost inevitable facet of social research. Nevertheless, these limitations could affect the generalisability of the results which should be interpreted with an appropriate level of caution.

The researcher also experienced various limitations with regard to the qualitative data collection process. First and foremost, the number of participants in this strand of the study numbered only three HCPs although the researcher approached 15 potential participants. Some of these expressed a willingness to participate and showed interest in the research topic but did not respond when they were asked to set a date and time to be interviewed. This could be explained by time constraints and their workloads which may have led them to ignore their interest in participating in a demanding research activity such as an 'interview'. It is also possible that they felt anxious about sharing information that might irritate their employers although the study information sheet and the consent form clearly stated that the confidentiality of the participants would be strictly observed. Secondly, although the interviewees were HCPs who had worked in the field of HIV/AIDS in Saudi Arabia for more than 5 years, they were all physicians. Thus, the views of other healthcare professionals, such as nurses, were not explored. Perhaps nurses have different perspectives and experiences which could add important issues that could enhance the understanding of the situation in the country. Then, the time frame impacted on the effort to recruit more HCPs to take part in the study. Finally, the limited nature of the resources available for doctorate study also prevented the researcher from recruiting a wide population since HCPs were recruited only from Makkah and Jeddah, the two main cities in the western province of Saudi Arabia. Therefore, if more time and resources were available, it would be useful to extend the study to other regions of Saudi Arabia.

6.7.3 Data analysis

One of the obvious difficulties faced during the analysis was integrating the two different sets of data. Despite the clear value of combining both quantitative and qualitative data

to enrich the understanding of a complex research question, it was challenging to incorporate such rich data in a logical story.

The following section outlines the contribution that the study has made to the field of HIV/AIDS.

6.8 The contribution of the study

The originality of the current study is apparent in various aspects. The study is original in terms of the setting, as well as the topic being researched within that setting. Most of the research about HIV/AIDS in Saudi Arabia has been conducted in Riyadh when official data show that the western province (the Makkah region) contains the highest incidence and prevalence of HIV in the country. In addition, in contrast to earlier research which focused on HIV/AIDS in the country, no other study has explored the HIV testing services or made comparisons between the genders.

Additionally, the current study supports the literature's findings in various aspects, such as those related to the level of misconceptions in terms of mode of transmission, preventive measures, and the severity of the infection. However, the current study indicates that a lack of sexual education, as well as the socio-cultural nature of Saudi Arabia, contributes to a great degree to the large scale of misconceptions among both male and female young adults.

In terms of HIV risk perception, the current study's findings indicate that male and female differ significantly in their perception of the risk of contracting HIV. Specifically, young male adults revealed higher HIV risk perceptions compared to their female counterparts. This finding has increased our understanding of Saudi socio-cultural aspects related to gender issues. Males in Saudi Arabia experience a considerable amount of freedom from an early age whereas the freedom of females is restricted in various aspects of their daily

lives. Such cultural values may translate into men's engagement in high-risk behaviours which, in turn, may translate into perceptions of high risk.

The current study highlights the importance of understanding the socio-cultural settings within and across nations and populations in order to achieve better outcomes in the fight against HIV/AIDS, in particular in scaling up HIV testing. Thus, the current study provides evidence that the socio-cultural context is one of the most important factors that impacts on the uptake of HIV testing in Saudi Arabia. It is evident that the effect of stigma on HIV testing behaviour is substantial and this is attached to religious, traditional and cultural beliefs. The study also highlights the need to make greater efforts, not only to increase awareness of HIV/AIDS, but also the location of HIV testing centres since it was clear there was a lack of awareness about where to obtain the HIV test.

In terms of the relationships between certain variables, the current study offers additional proof that the attitude toward HIV testing is positively associated with the willingness to be tested. In addition, the current study's findings also provide evidence that the level of HIV/AIDS related knowledge positively correlates with the perception of the risk of contracting HIV.

The current study has not limited itself to a mere description of the situation in Saudi Arabia; it also makes comparisons between and among the study's participants. For example, the study allowed differences between genders, and among age groups, to be identified. In addition, the study offers an action plan, which was informed by HCPs' perspectives, to improve the uptake of HIV testing in the country. So, the current study has also contributed by deepening an understanding of the diversity within the study population, as well as offering a possible solution to the problem of the low uptake of HIV testing in Saudi Arabia.

This study has also strengthened the understanding of the applicability of both the Theory of Reasoned Action (TRA) and the Theory of Planned Behaviour (TPB) in illuminating health-related behaviours such as HIV testing. The study revealed that all the components of both theories are essential to modify a behaviour, e.g. HIV testing. In other words, although attitudes towards HIV testing were reasonably favourable in the current study, other important constructs were unsatisfactory in terms of changing the testing behaviour. These constructs included subjective norms (social constraints), perceived behavioural control (self-efficacy), and intention to perform the behaviour.

Finally, the study explored in particular those factors that influence HIV testing among young people in Saudi Arabia. It was clear that even if there were similarities across nations and across populations, distinct features of each nation and population need to be addressed to tailor preventive measures to suit each setting and all individuals. For example, stigma is widely attached to HIV/AIDS worldwide but different actors contribute to the formation of stigma in each society and the level of its strength within each community varies.

6.9 Chapter Summary

This chapter has drawn together the findings from both sets of data, discussing them in the light of the literature. In some parts of this analysis, the current study was in agreement with existing findings; however, it also revealed certain context-specific features that distinguished the study's findings from those in the literature. It offers, moreover, an integration of the responses of young people and the views of healthcare professionals, as well as highlighting the major contribution of the study; this confirms the influence of the socio-cultural context on the uptake of HIV testing by young people in Saudi Arabia. This chapter has also provided an assessment of the quality of both sets of data, as well as acknowledging some methodological critiques.

7 Conclusion chapter

7.1 Introduction

This final chapter aims to offer a concise summary of the whole thesis, with the implications of the study's findings in terms of practice, policy and future research also being discussed. The chapter also provides concluding thoughts to end the thesis.

7.2 Thesis summary

The overall purpose of the current research project was to describe and explore the factors that influenced young people with regard to the uptake of HIV testing in Saudi Arabia. The study also attempted to assess differences across genders and age groups, as well as to examine relationships between certain variables. The study did not set out to examine any particular preventive intervention to improve the uptake of HIV testing among young people in Saudi Arabia but rather to unveil the challenges that hindered efforts to scale up the uptake of such tests.

Reviewing the facts and figures in the MENA region and within Saudi Arabia about HIV/AIDS epidemics and responses to them underscored the need to investigate this issue further. In addition, the study was also driven by the clear gap in knowledge that was found following the study's comprehensive narrative and systematic literature review. The review of the literature revealed that behaviours and practices in terms of HIV testing are complex and that its uptake depends on and is shaped by intrinsic and extrinsic factors. For example, fear could be an intrinsic factor that impacts on an individual's decision to seek HIV testing whereas stigma could be determined as an extrinsic factor affecting HIV testing behaviour. The literature also shows that context, in terms of the population, socio-cultural values and legislation, creates diversity in the factors affecting the uptake of HIV testing within and across nations.

In this research project, a mixed method design was used to explore what factors influenced the uptake of HIV testing in Saudi Arabia. Thus, an explanatory and sequential mixed method approach was selected in which emphasis on the quantitative strand outweighed that placed on the qualitative one. In other words, the study was mainly quantitative with the qualitative part of the study aiming to unveil hidden meanings behind the numbers and to add another perspective to the questions posed by the research. For the quantitative arm of the study, a cross sectional survey was used to describe certain factors that were shown to have contributed to the low level of HIV testing worldwide across a variety of populations. Thus, major factors were identified in the literature as individual level factors. These included: HIV/AIDS related knowledge, HIV risk perception and attitude toward HIV testing. On the other hand, the qualitative part of the study was conducted through semi-structured interviews with HCPs working in the field of HIV/AIDS in Saudi Arabia. The purpose of conducting these interviews was to understand the meaning of the findings which came to light via the questionnaire, as well as to explore the research inquiry from the points of view of HCPs since they are an integral part of the HIV testing process. This design allowed the problem under study to be explored from the perspective of those at risk, as well as those providing the service.

The findings of the current study revealed that misconceptions about HIV/AIDS are still prominent among young people in Saudi Arabia even though the study sample consisted of university students. The findings also indicated that the low level of knowledge relating to HIV/AIDS could be considered as one of the major influential factors in seeking behaviours for HIV testing. In addition, not only was the general awareness of HIV/AIDS found to be unsatisfactory, the awareness of the locations of HIV testing centres also seemed unacceptable and this appeared to have a considerable effect on the uptake of HIV testing.

The perception of risk and the attitude toward HIV testing appeared to be favourable in terms of promoting the uptake of HIV testing. However, extrinsic factors, such as stigma, social norms and culture, dominated the HIV testing seeking behaviours among young people in Saudi Arabia. The current study highlighted stigma in particular as the most important factor hindering the efforts to scale up HIV testing in the country. In this study, the HCPs also offered a potential plan to overcome the challenges in order to scale up the uptake of HIV testing among young people in Saudi Arabia.

The complexity of the research inquiry was clearly demonstrated when attempting to integrate the two sets of data. Thus, to improve HIV testing behaviour and practice within Saudi Arabia, particularly for young people, a multidisciplinary approach needs to be adopted. In spite of the fact that the study clearly contributes to filling the knowledge gap related to the influential factors that shape young people's HIV testing practice in Saudi Arabia, it also offers information that is valuable for policy, practice and providers. In addition, if the findings are processed and applied, they would be advantageous for future service users.

In the following section the potential implications of the research findings for policy making, practice and future research are also considered.

7.3 Recommendations for practice, policy and future research

7.3.1 Implications for practice

Although the findings of the current study demonstrated that young people in Saudi Arabia held relatively positive attitudes toward HIV testing, actual HIV testing was low among the participants. This indicates that the practice of HIV testing requires adjustment based on the needs of young people in the country. The current study provides rich information about HIV/AIDS related knowledge, attitudes towards HIV testing, and potential factors that influence young people's behaviour in terms of seeking HIV testing.

This information, if disseminated, would help HCPs understand the needs of this group in order to modify or enhance certain aspects of the HIV testing services in the country. For example, the participants articulated the lack of information about the location of HIV testing centres and so, if such information is treated seriously by the service providers, this would help in increasing HIV testing in general. Thus, increasing awareness about the availability of the services should be synchronised with efforts to increase the accessibility of these services.

The HCPs, particularly those working in the field of HIV/AIDS, should pay close attention to their attitude and behaviour with young people. The findings of the current study suggest that young people generally felt that HCPs were trustworthy in the community of Saudi Arabia. Therefore, maintaining or increasing this level of trust would reflect favourably on a service such as HIV testing, which is considered as a highly stigmatised disease. HCPs should operate these services in a non-judgmental manner. In addition, confidentiality should not only be maintained, but young people also need to be reassured that confidentiality is an integral part of all HIV/AIDS healthcare related services and is strictly observed by HCPs.

As part of the fight against HIV/AIDS, it is important to communicate the benefits of knowing one's HIV status whether or not symptoms exist. The findings of the current study demonstrate a wide gap in HIV/AIDS related knowledge, particularly with regard to knowledge relating to transmission, severity and prevention. Consequently, increasing the level of awareness about HIV/AIDS should be the main focus of the practical measures to increase the uptake of HIV testing. Transparency and comprehensibility should feature in the campaigns to raise awareness of HIV. In addition, close and thoughtful attention must be paid to the cultural issues in the Saudi Arabian context. Challenging stigmatising and discriminative beliefs, which are based on incorrect

preconceptions, should be encouraged. For example, the widely held belief that HIV/AIDS is an immoral disease and/or that an HIV infected individual is being punished for his/her immoral behaviour, needs to be addressed.

A provider initiating HIV testing appeared to be one of the most convenient strategies to increase the uptake of HIV testing in a Saudi Arabian context although the available figures concerning the prevalence and incidence of HIV in the country might limit its application. However, the recent official HIV/AIDS report submitted to UNAIDS acknowledged the shortcomings in these figures. The current study suggests that offering HIV tests would be an appropriate strategy to augment the uptake of testing by those at risk. The HIV test was included in mandatory pre-marital testing in 2008 and this was generally accepted by the public as a whole. Therefore, offering an HIV test as part of the routine check-up to those who are at most risk of contracting the disease, with an opt-out approach, would be a convenient strategy in a country such as Saudi Arabia.

The study also revealed that the stigma attached to HIV/AIDS in Saudi Arabia is enormous and reducing this stigma is one of the most important aspects in the fight against AIDS. HCPs should play their role in efforts to reduce the effect of stigma since evidence from the current study shows that stigma induced by HCPs is not uncommon in Saudi Arabia. In addition, the study suggests that it would be practical to incorporate HIV testing into a broader programme of testing that includes other diseases in order to reduce the impact of stigma on the uptake of HIV testing.

7.3.2 Implications for policy

The Saudi Arabian government's response to HIV/AIDS began when the first case of HIV was detected. The fight against HIV/AIDS has attracted a high level of political commitment since that time and remains a priority in the national development agenda. However, these commitments and efforts would be much more effective if they were

guided by evidence generated from empirical research that has evaluated the situation within the country and which reflects the real needs of the population. As UNAIDS and WHO have already highlighted, there is a need “to tailor prevention strategies to local needs” while recognising “the importance of decentralizing AIDS responses” (UNAIDS & WHO, 2009)

The socio-cultural complexity of sexually related matters in Saudi Arabia identified by this study indicates that HIV testing may not be high on the agenda of the Saudi population, in particular young people, yet many would be willing to accept an HIV test if it were to be offered. In addition, offering an HIV test on the basis of risk assessment would be a much more acceptable approach, especially if this was offered in conjunction with other important tests. Furthermore, the study emphasises the impact of the traditional and religious settings of Saudi Arabia in which the taboo and stigma attached to HIV/AIDS are dominant and prevent people from accepting HIV/AIDS health-related services such as HIV testing. Therefore, policy makers should intervene in order to reduce the stigma and taboo related to HIV/AIDS in the country. In addition to the favourable effect of reducing the scale of stigma on health service consumers, it is believed that this would encourage individuals and researchers to engage in research to shed light on central issues such as risky behaviours.

The study’s findings suggest that HIV awareness campaigns are substandard and sexual health education is not taken seriously by policy makers. Therefore, the gaps in HIV/AIDS related knowledge are wide and misconceptions dominate the preventive actions taken by individuals. The study suggests that an action plan should be established to increase the scale of awareness about HIV/AIDS while HIV/AIDS related services, such as HIV testing, should be more effectively broadcast. It is also important to ensure that awareness messages should be clear and informative, given that the existing messages might be lacking in both clarity and transparency. In addition, it seems

reasonable to incorporate sexual health education into the curricula of schools and universities to increase the overall awareness of sexually transmitted infections at earlier stages of adulthood.

7.3.3 Implications for future research

The study found that using an online questionnaire to engage young people (either men or women) in research, when it concerns a sensitive topic such as HIV, is a successful strategy. In particular, it seems an effective way to gather sensitive information from both genders given the socio-cultural context of Saudi Arabia in which regulations requiring gender separation are strictly enforced in various aspects of life; for instance, in academic institutions and schools. Therefore, looking beyond traditional ways of gathering information is a pragmatic and efficient means of bridging many gaps in the literature about socially sensitive issues in the context of Saudi Arabia.

The study pointed to various issues that require further research. If the socio-cultural framework of Saudi Arabia is the main factor restraining individuals from undertaking preventive action, such as taking an HIV test, it is critical to evaluate components of the Saudi socio-cultural framework to determine which aspects are more influential and dominant. It will also be important to investigate how these socio-cultural barriers could be mitigated in order to increase the uptake of HIV/AIDS preventive measures.

The study also highlighted the huge gap in HIV/AIDS related knowledge among young people, a gap which has also been indicated in previous research conducted in Saudi Arabia. Therefore, it will be crucial to evaluate the existing HIV/AIDS awareness campaigns, as well as to investigate the impact of introducing sexual health education in school and university curricula. In addition, the study suggests that, not only is the general awareness about HIV/AIDS inadequate, even awareness of the availability of HIV/AIDS health related services is lacking. Thus, it is worth reviewing the advertisement strategy

that the National AIDS Program is employing and investigating how such strategies might be improved.

Although the attitudes toward HIV testing indicate that young people are relatively open to the HIV test, the belief that they are not at risk of contracting HIV is the main reason for them not being tested previously. These findings suggest that exploring HIV risky behaviours and practices is inevitable in order to assess the needs of young people. However, this requires political commitment to encourage researchers to investigate these issues as they are considered taboo subjects since most such behaviours are strictly penalised in Saudi Arabia.

In terms of health care professionals, the study offers the valuable accounts of HCPs, particularly doctors, which enrich our understanding about the factors influencing young people's decision to get tested for HIV. It would also be promising if the views of other HCPs and other professionals working in the field of HIV/AIDS, such as nurses, counsellors and social workers, could be explored. In addition, the accounts of HCPs indicated that stigma is the main obstacle hindering the uptake of HIV testing in the country for all actors and sometimes stigma is induced by HCPs. Accordingly, it seems necessary to investigate the issue of stigma in healthcare facilities and services, and to explore the perspectives of HCPs about the stigma of HIV/AIDS in order to reduce its effect in the Saudi Arabian context.

7.4 Concluding thoughts and closing remarks

The general aim of the current research was to find out the factors affecting the utilisation of HIV testing by young people in Saudi Arabia and it is seems that, in a country such as Saudi Arabia, achieving this goal is not an easy task. The strictly conservative nature of Saudi Arabia in term of religious beliefs, social norms and legislation, such as criminalising high risk behaviours, complicate the problem. Thus, merely improving

awareness levels about HIV/AIDS or the availability and accessibility related services will not be enough to improve the uptake of HIV testing. Tackling HIV/AIDS in general in Saudi Arabia requires a multidisciplinary approach and the engagement of legislators, community leaders, healthcare policy makers, HCPs and representatives of the at-risk groups, such as young people.

Knowledge, attitudes and HIV risk perceptions are critical factors that inform young individuals in the process of decision making so these factors could either increase or decrease the chance that they will undertake the HIV test. However, socio-cultural constraints are a significant additional burden that could affect an individual's decision to be tested for HIV in Saudi Arabia. Thus, when tailoring HIV/AIDS preventive strategies in Saudi Arabia, the effect of socio-cultural constraints should never be underestimated.

“Unity is strength ... when there is teamwork and collaboration, wonderful things can be achieved”. Mattie Stepanek

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Appendix

Appendix A (studies included in the systematic literature review)

Study reference	Country	Study objectives	Study design	Study participants	Sample size	Quality issues
Yasin et al. (2013)	Mongolia	To identify factors associated with recent HIV testing among MSM in Mongolia	Quantitative study, cross sectional evaluation structured questionnaire	MSM	313	Respondent driven sampling may affect the quality of the findings in terms of representativeness.
Lee et al. (2015)	Lima, Peru	<ul style="list-style-type: none"> To identify the history and frequency of HIV testing among low-income MSM/TW in Lima, Peru To assess the relationship between sexual risk behaviours and HTC To identify motivations and barriers to HIV testing. 	Quantitative retrospective study A cross-sectional analysis of baseline survey data	MSM	718	The retrospective nature of the study which attempts to analyse secondary data may affect the validity of the results.
Strauss et al. (2015)	KwaZulu-Natal, South Africa	To examine the factors affecting the utilisation of HCT services amongst learners in high schools in the KwaZulu-Natal province of South Africa.	Qualitative study FGD , framework analysis	Adolescents Age 16 and above	158 participated in the FGDs	As a qualitative research the researcher may have induce bias.
Wei et al. (2014)	Nanjing, China	To identify barriers and facilitators to HIV testing and treatment	Qualitative study FGD	MSM	49	As a qualitative research the researcher may have induced bias. Convenience sampling affects the generalisability of the findings. FGD would affect the participants' responses as a result of the stigma related to HIV/AIDS

Samrith et al. (2015)	Takeo Province, Cambodia	To identify the key barriers to TB patients' referral for HIV testing services.	Quantitative study Semi-structured questionnaire	HCP	43	Sample size and sampling technique limited the generalisability. The barriers stated by the HCP were based on opinion rather than experience.
Agusti et al. (2013)	Spain	To identify perceived barriers and needs in order to implement rapid testing in primary care settings.	Quantitative study Cross sectional questionnaire	HCP in particular GPs	1308	Sampling techniques may induce bias as it is a non-probability one.
St. Lawrence et al. (2015)	USA (Milwaukee, Cleveland, and Miami)	To examine racial minority MSMs' views about HIV testing.	Qualitative study In-depth interviews	Key informants & African Americans	96 & 100	Recruitment of key informants seems ineffective and in terms of MSM also inadequate as it was informed by the key informants' guidance.
Woodford et al. (2015)	Chennai, India	To identify multi-level barriers and facilitators to HIV testing	Qualitative study 12 FGD & 12 semi-structured interviews	Key population (MSM, FSW, transgender and IDUs) & Key informants	84 Key populations & 12 Key informants	The sensitivity of the topic being researched could affect the participants' responses.
Weihls and Meyer-Weitz (2015)	South Africa	To Identify barriers to workplace HIV testing in south Africa	Systematic review 4 Studies <ul style="list-style-type: none"> Quantitative survey longitudinal Cross-sectional survey Qualitative, FGD, semi structured interviews Qualitative, unstructured interviews 	4 Studies <ul style="list-style-type: none"> Black employees of a rural factory HCW Employees, mining industry HCW 	4 Studies <ul style="list-style-type: none"> n = 2138 n = 928 n = 75 n = 26 	The limited number of studies included in the review may affect the quality of the recommendation revealed by the study. Exclusion of the grey literature may also induce bias.

Bhoobun et al. (2014)	Bo, Sierra Leone	To identify attitudes toward and experience with voluntary testing and counselling (VCT) for HIV.	Quantitative study community-based cross-sectional study using questionnaire	Young adults (age 18–35 years)	285	Although the sample is randomised the result can't be generalised to the entire country. The randomisation process not clear.
De Allegri et al. (2015)	Nouna, Burkina Faso	To explore factors shaping the decision to undergo Human Immunodeficiency Virus (HIV) testing among men in rural Burkina Faso.	Mixed methods Quantitative survey & in-depth interviews	Men , age 20 ≥	Quantitative 1130 Qualitative 38	Sampling men through households would affect the ability to generalise the results. Evidence shows that social desirable bias may affect the survey responses.
Sison et al. (2013)	USA, Mississippi Delta region	To explore attitudes and practices regarding HIV testing and linkage to care.	In-depth qualitative interviews	HCPs (primary health care provider & infectious disease specialists)	25	As it is a qualitative study, the findings can't be generalised.
Bien et al. (2015)	China	To inform the development of more comprehensive (STD) testing programs among MSM, through a collection of descriptive data on MSM testing practices. and preferences.	Semi-structured qualitative interviews	MSM	35	As a result of the stigma around MSM in China, participants' responses may be affected by social desirability bias.
Hong et al. (2012)	China	To fill the literature gap on HIV testing among FSW in China.	A cross-sectional survey	FSW	1022	The sampling techniques could miss a group of FSW and over sample certain FSW thus, generalisability could have been affected. The findings could also be affected by volunteer & social desirability biases.
Deblonde et al. (2014)	4 European countries (Belgium, Estonia, Finland and Portugal)	To examine how HIV testing is carried out in Europe and how practices relate to HIV testing policies.	A cross-sectional survey	Recently diagnosed (≤ 3 years) HIV infected	629	The study relied on self-reported data which may be prone to reporting error, recall and social desirability biases. Some high risk individuals such as IDUs

						were under represented which might affect the generalisability of the findings.
Wright et al. (2013)	USA, rural Delta region of Arkansas	To identify barriers to the utilisation of HIV testing	Qualitative study <i>Individual Interviews & FGDs</i>	African American recently used cocaine	69	The small sample size and unique setting of this study may reduce generalisability.
Addis et al. (2013)	Ethiopia	To assess the level of knowledge, attitude and practice of Voluntary Counselling and Testing (VCT) for HIV among university students in North West Ethiopia.	A cross sectional survey	University students	330	It is a single university-based study thus generalisability of the results can't be achieved.
Wong (2013)	Malaysia	To identify demographic characteristics and correlates of the uptake of HIV testing, willingness to be tested and perceived HIV-related stigma of Malaysian lay public.	A cross sectional survey Computer assisted telephone interview	Lay public	2271	Self-reporting may induce bias and the nature of the cross sectional study makes it difficult to point to the cause and effect relationship.
Pinheiro Júnior et al. (2015)	Brazil, Fortaleza	To identify factors associated with resistance to HIV testing among transwomen in Fortaleza/CE.	A cross-sectional study questionnaire	Transwomen	304	The sampling technique may affect the generalisability. Using incentives could also induce bias.
Lahuerta et al. (2013)	Guatemala, Escuintla	To assess attitudes towards prevention of HIV/STIs, barriers to condom use and behaviour towards HIV/STI testing and treatment.	Qualitative study	Men (Clients of FSW)	30	The recruitment process would indicate that the study sample could not be referred to as a representative sample. As a result of the extreme sensitivity of the topic the participant response maybe affected by social desirability bias.
Christopoulos et al. (2012)	USA, Northern California	To understand patient acceptance and refusal of ED HIV testing.	Qualitative study in-depth interviews	Emergency department patients	50	As it is a qualitative study the findings can't be generalised. The setting of the study (ED) and the nature of the participants who

						respond while they were seeking ED for other health problems so their response might be not reflective.
Guadamuz et al. (2015)	South East Asia (10 countries)	To characterise MSM who were never tested for HIV, to identify correlates of never testing, and to elucidate the perceived barriers to HIV testing.	Quantitative study large Internet survey	MSM	4310	Non-probability sampling technique might affect the ability to generalise the results.
Njosing et al. (2010)	Cameroon	To explore the facilitators and barriers to HIV testing.	Qualitative research interviews	TB patients in four selected TB and HIV/AIDS treatment centres	21	The first author might influence the responses due to his role in the TB/HIV Programme in the country.
Njau et al. (2012)	Tanzania	To assess the acceptability of home-based couples counselling and testing (HBCCT) approach.	Qualitative data collection methods through focus group discussions and in-depth interviews	Married men and women, HIV-infected individuals, health care and home-based care providers, voluntary counselling and testing counsellors, and community leaders.	91	
Lally et al. (2008)	USA, Rhode Island	To explore barriers and facilitators for testing and receiving results and treatment for hepatitis and HIV, as well as for hepatitis vaccination.	Qualitative study design through individual semi-structured Interviews	Injection drug using women	20	Sampling method is not clear. Although the sample size was consistent with qualitative research method, large scale study is needed to address the problem in the study population from all aspects.

Ma et al. (2007)	China, Guizhou province	To find and compare the levels of acceptance of and barriers to voluntary counselling and testing (VCT) among adults in two different counties of Guizhou province.	Longitudinal design with two-stage cluster sampling.	Adults in two Guizhou province counties.	1012	Participants were paid to return the coupon whether they choose to test or not. In addition, information bias has been acknowledged as a limitation of the study.
Payne et al. (2006)	USA	To investigate the acceptability of rapid HIV testing among African-American college students in a non-traditional setting on a historically black college/university (HBCU) campus.	Cross-sectional survey	African-American college students aged (18-24)	161	Study findings cannot be generalised as a result of small sample size. Participants received credit for their participation which might influence their response.
Peralta et al. (2007)	USA, State of Maryland	To examine the barriers and facilitators of HIV counselling, testing, and referral service acceptance.	Cross-sectional survey	Youth aged 12–24 years old	278	Study participants were recruited from convenient locations which might affect the representativeness of the study population.
Myers et al. (2011)	USA, San Francisco	(a) To assess HIV testing practices and barriers and facilitators to expanding routine HIV testing in publicly funded primary care settings in San Francisco. (b) To develop recommendations and strategies for expanding routine HIV testing and comprehensive follow-up for HIV-infected patients based on the results of the situational assessment and the input of stakeholders and experts in the field.	Qualitative interview	Key informants	18	Medical directors' view could not reflect the real practice of the service provider.

McCoy et al. (2009)	USA	To understand barriers and facilitators to HIV testing and care in people with advanced HIV.	Qualitative interview	People with advanced HIV	24	Purposive sampling technique was employed which affects the generalisability of the findings.
Johnson et al. (2011)	USA, Massachusetts	To identify barriers and facilitators to implementing CDC recommendations and to elucidate strategies to improve routine HIV testing.	Qualitative interview, semi-structured.	Community Health Centre Personnel	30	Convenience sample of 30 community health centre leaders out of 52 total CHCs, one from each centre, thus the view of the participants might be affected by their centre.
Moyer et al. (2008)	USA, 2 Mexico –US border cities	To identify barriers associated with HIV testing among injection drug users (IDUs).	Cross-sectional surveys, questionnaire	IDUs	222 IDUs in Tijuana and 206 IDUs in Ciudad Juarez	
Mahendradhat a et al. (2008)	Indonesia, Jogjakarta	To investigate the barriers and opportunities for introducing HIV testing perceived by TB patients and providers.	Qualitative study through interview and focus group discussion.	TB patients and health care providers (physicians, disease control managers and nurses)	33 TB patients, 3 physicians and 3 disease control managers. 4 FGDs were carried out each one consisting of 9 to 8 nurses	
Mills et al. (2011)	USA, New York City	To assess barriers to HIV testing, health care contacts history, and HIV testing history among patients diagnosed concurrently with HIV and AIDS.	Cross-sectional survey	Patients diagnosed concurrently with HIV and AIDS	139	236 were eligible for the study however, only 139 participated in the study.

Lopez-Quintero et al. (2005)	USA	To explore barriers to HIV testing, and intentions to be tested among a nationally representative sample of the different Hispanic subgroups living in the United States.	Cross-sectional survey (NHIS)	Hispanics living in the USA	4261	Reporting bias was minimised since the (NHIS) was designed to limit this form of bias. The study excluded eligible participants such as the hospitalised and prisoners.
Arbelaez et al. (2012)	USA	To examine the willingness of ED providers to offer HIV testing, as well as their perceived barriers to the implementation of these guidelines.	Cross-sectional survey, 21-item questionnaire administered before the implementation of the program and six month afterwards.	Hospital emergency department providers	159 completed the survey before the program started whereas 141 completed the survey after a six month period.	The study instrument has not been validated. The study sample might be biased because people who declined participation could have a different perspective from those who participated.
Korthuis et al. (2011)	USA	To explore general Internists' Beliefs, Behaviours and Perceived Barriers to Routine HIV Screening in Primary Care.	Cross-sectional internet-based survey	General internists in USA	446	There is a potential sampling bias since the response rate was low. Reporting bias could be occurred.
Mimiaga et al. (2009)	USA, Massachusetts	To explore the frequency of testing, as well as health system and personal barriers to testing, among a community-recruited sample of Black (MSM) at risk for HIV and STDs.	Quantitative assessment	Black men who have sex with men	197	Sampling bias might have occurred because the participants were recruited through respondent-driven sampling technique. In addition, interviewer might induce bias "social desirability bias" since sexual topics are sensitive in general and very sensitive in MSM in particular.
Delva et al. (2008)	Bosnia And Herzegovina, FYR of Macedonia,	To examine the uptake of HIV testing and associated predictors.	Cross-sectional survey	Sexually active youth in Balkans	651	Sample size appears to be relatively small. The findings cannot be generalised since the

	Serbia, and Montenegro					participants were recruited from urban school only. However, selection bias has been avoided because researcher applied opt-out strategy rather than opt-in.
Song et al. (2011)	China, Beijing	To identify psychological and structural barriers to HIV testing.	Cross-sectional survey through self-administered questionnaire	Migrants MSM	307	Generalisability of the results is limited because the sample is convenience sample. Self-reported bias could have occurred.
Schwarcz et al. (2011)	USA, San Francisco	To Identify barriers to HIV testing among late HIV testing	Qualitative interview	Late HIV tester	41	As a result of small sample size, study findings cannot be generalised. Interviewer could induce bias since the interview conducted by 5 interviewers.
Manirankunda et al. (2012)	Belgium, Flanders	To identify physicians' HIV testing practices and their barriers toward implementing provider-initiated HIV testing and counselling (PITC) for Sub-Saharan African migrants (SAM) in Flanders, Belgium.	Qualitative in-depth interview	Physicians	20	Purposive sample
Christianson et al. (2010)	Sweden	To explore how young women and men in Sweden experience HIV-testing within primary healthcare.	Qualitative six focus-group interviews	Young women & men aged between 18 and 24	23 (14 women & 9 men)	The findings cannot be generalised if the FGI repeated with other young people could produce different results. Anonymity cannot be maintained in FGI which may affect the responses.
Manirankunda et al. (2009)	Belgium	This study explored perceptions, needs, and barriers of sub-Saharan African migrants in relation to HIV voluntary counselling and testing (VCT).	Qualitative study through focus group discussions	Sub-Saharan African migrants	70	Study findings cannot be generalised.

Beattie et al. (2012)	India, Karnataka state	To understand the barriers to and identify potential solutions for improving HIV service utilisation.	Qualitative study through focus group discussions	Female sex workers, men who have sex with men and transgender, and programme peer educators	302	Study findings cannot be generalised. The sample appears to be unrepresentative of the study population because purposive sampling technique was used.
Ostermann et al. (2011)	Tanzania, Kilimanjaro Region	To assessed barriers to testing and HIV risk among clients participating in mobile voluntary counselling and testing (MVCT) campaigns in four rural villages in the Kilimanjaro Region of Tanzania.	Survey	Clients participating in mobile voluntary counselling and testing (MVCT) campaigns	1384	
Namakhoma et al. (2010)	Malawi	To explore the enablers and barriers to HIV counselling and testing and antiretroviral therapy by health workers in Malawi.	Mixed methods	Health worker	906	Sampling method of the quantitative part appears to be robust and decrease the bias. However, in the qualitative part there is no clear evidence on the sampling method as well as the sample size.
Dietz et al. (2008)	USA, Kansas City, Missouri	To evaluate the patient perspective on rapid HIV screening in free dental clinic.	Assessment survey	Clients of dental clinic	150	The sample is convenient sample which might induce bias. The study was conducted in only one dental clinic which limits the ability to generalise the findings.
Inungu (2002)	USA	To assess potential barriers to seeking (HIV) testing among adults in the United States.	Cross-sectional survey	Adult non-institutionalised civilian population	32440	There is a high risk of self-reported bias.
Flowers et al. (2003)	UK, Scotland	To describe the relationship between HIV testing and a range of psychosocial, sexual and socio-demographic variables.	Cross-sectional study	MSM	803	There is a high risk of self-reported bias. The sample is purposive which makes the findings less likely to be generalised.

Spielberg et al. (2001)	USA, Seattle	To identify factors influencing HIV testing decisions among clients at a sexually transmitted disease clinic, gay men, and injection drug users.	Qualitative study through FGDs and intensive interview	Three at risk groups (MSM, IDUs in the needle exchange store, STD Clinic clients)	100	Study finding cannot be generalised. Participants were paid for participation as incentive which may affect their responses.
Bwambale et al. (2008)	Uganda, Kasese district	To determine the prevalence and factors associated with VCT use.	Population-based cross-sectional study employing both quantitative and qualitative techniques	Men	780	Sampling appears to be well performed to reduce bias as well as to ensure representativeness. Reporting bias could occur as the study depends on self-reporting.
Ford et al. (2004)	Indonesia, Bali	To identify factors related to the use of voluntary HIV testing among drug users.	Qualitative study through in-depth interview	IDUs	40	The findings cannot be generalised.
Dowson et al. (2012)	UK	To identify ideas and themes as to why testing was not carried out earlier in men who have sex with men (MSM) who presented with late HIV infection.	Qualitative study through semi-structured interviews	Late presenter MSM	17	The findings cannot be generalised.
Mugisha et al. (2010)	Uganda	To explore and describe the current models of VCT service delivery in fishing communities.	Quantitative study through structured interview	Fishing community	127	There is evidence that sampling bias was minimised by randomisation. There is high risk of social desirability bias since the interviews were conducted face to face.
Bollini et al. (2002)	Hungary, Switzerland and Italy	To assess national HIV prevention policies in prison in a selected group of countries; and to determine which factors influenced such policies at the country level.	Policy analysis through quantitative and qualitative methods	Key informants from GOs & NGOs in each country	N/A	
Gyarmathy et al. (2004)	Hungary	To assess HIV and hepatitis testing and counselling in drug treatment programs.	Qualitative study through telephone interview	Key informants	8	The finding cannot be generalised.

Mikolajczak et al. (2006)	Netherlands	To explore reasons for not taking an HIV-test among untested men who have sex with men (MSM)	Internet-based survey	Users of one of the largest free MSM Chat websites	1627	The findings cannot be generalised. Reporting bias and/or social desirability bias might have occurred.
Burns et al. (2008)	UK, London	To identify opportunities for earlier HIV diagnosis within primary and secondary care settings in the UK in Africans with newly diagnosed HIV infection.	Quantitative study through self-completed questionnaire	Newly diagnosed HIV-positive Africans	263	The findings cannot be generalised since the sample was recruited only from London. Recall bias may have occurred.
Prost et al. (2007)	UK, London	To explore the feasibility and acceptability of translating a successful VCT service model from Kenya to African communities.	Qualitative study through focus group discussions and a workshop	People living in African communities, and key informants	42 participants from 14 African countries & 28 Key informants	The findings cannot be generalised. Purposive sampling technique may induce bias.
Stolte et al. (2007)	Netherlands	To investigate HIV testing behaviour and HIV prevalence among homosexual visitors of an STI outpatient clinic, and to investigate determinants of unknown HIV status, and of HIV testing separately for men with unknown and negative HIV status	Cross-sectional survey	MSM with negative or unknown HIV status	1201	Care should be taken to generalise the findings since they only represent MSM who visit STDs clinic. Reporting bias and/or social desirability bias might have occurred.
Forsyth et al. (2008)	UK, London	To describe reasons why high-risk patients decline HIV testing and whether offering rapid point of care testing along with standard testing would increase the uptake of HIV testing in two London GU medicine clinics.	Cross-sectional survey	Patients attending GU medicine clinic in London	899	
Dukers-Muijers et al. (2009)	Netherlands, South Limburg	To evaluate the effectiveness of the opt-out approach in HIV testing.	Document analysis of laboratory surveillance	STDs clinic attendees	12949	

			records and consultation records			
Heijman et al. (2009)	Netherlands	To assess the effect of the opt-out strategy on the uptake of HIV testing and to identify factors associated with refusal of HIV testing	Document analysis of consultation records	STDs clinic attendees	25221	
Wong et al. (2012)	USA	To examine reasons for and barriers to participating in HIV voluntary counselling and testing for Asian/Pacific Islander (A/PI) men who have sex with men.	Cross-sectional community-based participatory design	Asian Pacific islander	445	Purposive convenience sample was used in the study which may affect generalisability.
MacPhail et al. (2008)	South Africa	To establish the perceptions of and needs for VCT among young people.	Qualitative study through FGDs	Young people aged between 12 and 24 and parents	240 adolescents and 120 parents	
Van Dyk and Van Dyk (2003)	South Africa	To determine the needs, attitudes, and beliefs of sample of South Africans towards VCT, and to investigate possible barriers affecting participation in VCT in South Africa.	Cross sectional survey through semi-structured questionnaire	South Africans	1422	Interviewer bias might have occurred. (The field workers were students enrolled in HIV course.)
Nunn et al. (2012)	USA	To assess patients' motivations, perceptions and clinical experiences with rapid HIV testing.	Qualitative study using semi-structured interview	African Americans undergoing rapid HIV testing	60	
Simmons et al. (2011)	USA	To obtain the views of health care providers regarding the meaning of routine HIV testing and the barriers and facilitators to implementing routine HIV testing in their respective practices.	Qualitative interview using open-ended questions	Health care providers from 6 cities across USA	24	Sampling frame limits the views of diversity.

Partridge et al. (2009)	UK	To estimate the number of patients in whom they had considered and performed HIV testing and reason for not testing patients in whom the diagnosis had been considered.	Postal questionnaire-based survey	Registers employed within Sheffield	281	
Bogart et al. (2010)	USA	To examine provider-reported barriers to rapid HIV testing in U.S. urban non-profit community clinics, community-based organisations (CBOs), and hospitals.	Cross sectional study		172	
Kharsany et al. (2010)	South Africa	To assess the uptake of provider-initiated HIV testing and counselling (PITC) among women attending an urban sexually transmitted diseases (STD) clinic in South Africa.	Cross sectional study	Women attending STDs clinic	8444	
Prestage et al. (2012)	Australia	To investigate the barriers to HIV testing among Australian gay men.	Online survey	MSM	519	

Appendix B (systematic literature review findings)

	Study reference	Population concerned	Factors
1	N. Njizing <i>et al.</i>	TB patients	<p>Barriers: Fear of disclosure of results, harmful gender norms and practices, fear of stigma and discrimination, and misconceptions surrounding HIV/AIDS deterred HIV testing.</p> <p>Facilitators: The desire to be healthy and live longer.</p>
2	B. Njau <i>et al.</i>	Northern Tanzanian individuals	Lack of privacy in the home setting, concerns about the confidentiality as well as anonymity of HIV test results, fear of knowing their HIV status and having their status shared with their partner. Fears of negative consequences from knowing one's HIV status, including stigma, blame, physical abuse, or divorce.
3	M. Lally <i>et al.</i>	IDUs women	The most serious barrier was the prioritisation of obtaining drugs over attention to one's health, low level of disease-specific knowledge, stigmatisation, and accessibility of testing and psychological factors.
4	Wei Ma <i>et al.</i>	Adults in two Guizhou province counties	Perceiving oneself as low risk, fear of unsolicited disclosure, and fear of stigma and discrimination that would result from taking the test.
5	N. Payne <i>et al.</i>	African-American college students	Receiving an HIV test could affect relationship with partner, lack of information about local HIV testing sites and fear that HIV testing results would not be kept confidential.
6	L. Peralta <i>et al.</i>	Youth aged 12–24 years old	Low perception of risk and never having been offered a test as reasons for not having been tested.
7	J. Myers <i>et al.</i>	San Francisco residents	Provider attitude could be a barrier as well as a facilitator and addressing the reality of competing clinical priorities that may supersede spending time on health maintenance activities like HIV testing.
8	S. McCoy <i>et al.</i>	HIV patients in advance stage	Lack of perceived susceptibility to HIV infection or low risk perception, fear, substance abuse, and the presence or absence of symptoms.
9	C. Johnson <i>et al.</i>	Massachusetts Community Health Centre Personnel	(1) provider time constraints, including time to administer counselling and separate informed consent; (2) lack of funding, staff, and space; (3) provider, patient, and

			community discomfort; (4) inconsistent levels of awareness regarding CDC recommendations; and (5) perceived incompatibility with Massachusetts HIV testing policy.
10	L.Moyer	IDUs	Insufficient HIV services, lack of testing standards or lack of awareness of the availability or importance of HIV testing.
11	Y.Mahendradhata	TB patients	Patients' perspective: burden for accessing VCT and fear of knowing the test results, low risk perception. Providers' perspective: communication (difficulties to communicate on HIV issues, lack of time and adequate facilities.), patients feeling offended and stigmatisation.
12	C. Mills <i>et al.</i>	Patients diagnosed concurrently with HIV and AIDS	Low risk perception (major 64%), fear of knowing one's HIV status (13%), lack of knowledge about HIV, No one offers an HIV test.
13	C.LOPEZ-QUINTERO <i>et al.</i>	Hispanics living in USA. Data from the 2000 National Health Interview Survey (NHIS)	Low risk perception (major 75%), afraid of results, stigma, lack of knowledge about where to get tested.
14	C. Arbelaez <i>et al</i>	Hospital emergency department providers.	Inadequate resources, time constraints and concerns regarding provision of follow-up care.
15	P.Korthuis <i>et al.</i>	General internists' in USA	Competing priorities at the time of visit, lack of time, perceived patient reluctance/refusal and informed consent requirements.
16	M. Mimiaga <i>et al.</i>	Black MSM in Massachusetts	Low risk perception, the belief that their partners are "clean.", fear of knowing one's status, lack of motivation to seek testing, time constraints and concerns over confidentiality.
17	W. Delva <i>et al.</i>	Sexually active youth in Balkans	Fear of the diagnosis, fear of violation of confidentiality, and not knowing where to go for HIV testing.
18	Y. Song <i>et al.</i>	Migrants MSM in Beijing	Perceived low risk of HIV infection, fears of being stigmatised, inconvenience of doing test and lack of confidentiality.
19	S.Schwarzc <i>et al.</i>	Late HIV tester in San Francisco	Fear, unaware of: improved HIV treatment, free/low cost care, and risk for HIV.

20	L. Manirankunda <i>et al.</i>	Sub-Saharan African migrants (SAM) in Flanders, Belgium	Lack of information on the HIV epidemic among SAM, fear of stigmatising patients, perceiving testing as unethical for undocumented patients, questionable relevance of pre-test counselling, lack of expertise in discussing sexuality, language barriers, lack of time, and the absence of a national or regional HIV testing policy.
21	M. Christianson <i>et al.</i>	Young people in Sweden	(1) Obstacles accessing the clinic: Administrative barriers such as difficulties in getting appointment, Communicative barriers such as lack of encouragement as well as offering. (2) Quick and easy testing: respondents prefer very quick pre-test information rather time consuming traditional pre-test counselling. (3) Conflicting and unclear information about test results: difficulty in understanding the results especially when it's communicated over the phone.
22	L. Manirankunda <i>et al.</i> (2)	Sub-Saharan African migrants (SAM) in Belgium	Fear of positive test results and its related personal and social consequences, lack of information, lack of preventive health behaviour, denial of HIV risk, and missed opportunities. Limited financial resources were only a concern for some subgroups like young people, asylum seekers, and recent migrants.
23	T. Beattie <i>et al.</i>	Most-at-risk groups (female sex workers, men who have sex with men and transgender)	The fear of the psychological impact of a positive HIV test result and the perceived repercussions of being seen accessing HIV services were key personal and interpersonal barriers to HIV service utilisation. Previous experiences of discrimination at government healthcare services, coupled with discriminatory attitudes and behaviours by VCT staff, were key structural barriers to VCT service uptake among those who had not been HIV tested. Among those who had used government-managed prevention of parent to child transmission and antiretroviral treatment services, poor physical facilities, long waiting times, lack of available treatment, the need to give bribes to receive care and discriminatory attitudes of healthcare staff. Presented additional structural barriers.
24	J. Ostermann <i>et al.</i>	Tanzanians in the Kilimanjaro Region	Distance from available testing sites, not being able to leave work, not knowing where to get tested, lack of knowledge about available testing options, afraid to receive test results, did not want others in the village to see them testing, or worried about test confidentiality, and partner disagreement or unavailability.

25	I. Namakhoma <i>et al.</i>	Malawian health workers	Fear of a positive result, fear of stigma and lack of confidentiality. Additional barriers included health workers' personal acquaintance with those conducting testing, along with their perception of being "role models" which could exacerbate their fears about confidentiality.
26	C. DIETZ <i>et al.</i>	Dental clinic users	Low self-perception of risk and feeling uncomfortable.
27	J. INUNGU	American non-institutionalised adults	Low self-perception of risk and fear of adverse consequences.
28	P. Flowers	Scottish MSM	Fear of a positive result, perceived problems with clinics and problems with waiting for test results.
29	F. Spielberg	Three at risk groups: (MSM, IDUs, STDs clinic clients)	<i>Individual Barriers:</i> fear of receiving a positive result, fear of physical death and social discrimination, fear of dying from AIDS, low self-perception of risk and lack of support. <i>System Barriers:</i> concerned about named reporting, connection to care after the test. <i>Counselling and Testing Barriers:</i> waiting time for the test result, and for a scheduled test, venipuncture, especially for IDUs.
30	F. Bwambale	Men in rural western Uganda	Fear of inaccuracy of the HIV testing, fear of stigma, fear of divorce or separation from partner, lack of confidentiality and male superiority.
31	K. Ford <i>et al.</i>	Indonesian IDUs living in Bali	Fear of a positive result, fear of death from AIDS, stigmatisation of HIV-positive persons, lack of a cure or effective treatment for AIDS, lack of information about AIDS and HIV testing, long wait for the result, concerns about confidentiality and dislike of having their blood drawn.
32	L. Dowson <i>et al.</i>	MSM	Fear of illness and dying, stigma surrounding testing for HIV and in living with a positive diagnosis and perceived low risk of contracting HIV.
33	E. Mugisha <i>et al.</i>	Fishing community in Kasenyi Uganda	Fear of the test results, no time for an HIV test, did not consider HIV testing necessary and the expense.
34	P. Bollini <i>et al.</i>	Prisoners	Prison authorities lack knowledge on the content of international guidelines on HIV/AIDS management in prisons and on HIV monitoring techniques.
35	V. Gyarmathy <i>et al.</i>	IDUs	Lack of resources, lack of training of staff and lack of guidelines.

36	J. Mikolajczak <i>et al.</i>	MSM	Fear of a positive test result and fear of the detrimental consequences of a positive test.
37	F. Burns <i>et al.</i>	African migrants in UK	Low appreciation of personal risk, lack of perceived ill health, afraid of the result, lack of knowledge on the benefits of testing, afraid of stigma associated with HIV and clinicians are failing to be proactive in addressing HIV testing with patients coming from high-endemic countries.
38	A. Prost <i>et al.</i>	African migrants in UK	Worries about confidentiality, worries due to HIV-related stigma and worries about professional standards in community-based testing services.
39	I. Stolte <i>et al.</i>	MSM	Fear of positive test result, not ready to cope with a positive test, no HIV pre-test discussion in one-fifth of the booking interviews, universal offer policy not implemented and maternity unit as the most important factor determining uptake of HIV testing.
40	S. Forsyth <i>et al.</i>	Genitourinary medicine clinic attendees	Fear of positive test result.
41	N. Dukers <i>et al.</i>	STDs clinic attendees	Fear of positive test result.
42	R. Heijman <i>et al.</i>	STDs clinic attendees	Fear of positive test result.
43	F. Wong <i>et al.</i>	Asian Pacific islanders living in USA	Low risk perception, laziness, not knowing where to get tested, fear of disclosure and fear of positive test result.
44	C. MacPhail <i>et al.</i>	Young people	Fear of positive test results and its related personal and social consequences, fear of stigma and discrimination attitudes of nursing staff, lack of appropriate adolescent services and mistrust of counselling quality
45	van Dyk AC & van Dyk PJ	South African population	Logistics problems (not enough counsellors, long lines and lack of privacy); lack of trust in health care system or fearing of breach of confidentiality; fear of rejection and lack of support after diagnosis.
46	A. Nunn <i>et al.</i>	African Americans living in USA	Low self-perceived risk, HIV stigma and haemophobia.
47	E. Simmons <i>et al.</i>	American health care providers	Time and financial constraints; inadequate HIV education and training.
48	D. Partridge <i>et al.</i>	Registers employed within Sheffield	Uncertainty about counselling, belief that local policy or General Medical Council guidance discouraged testing, concern about distressing patients and harming the doctor-patients relationship, lack of suitable location for counselling and anxiety on the part of the doctor about how to manage a positive result.

49	L. Bogart <i>et al.</i>		
50	A. Kharsany <i>et al.</i>	Women attending urban STDs clinic	Already been tested for HIV, being afraid to test or felt unready to test and the need to consult with partner.
51	G. Prestage <i>et al.</i>	MSM	Low risk perception, the need to return for the test result and lack of any symptoms as reasons for not having been tested.
52	Yasin <i>et al.</i> (2013)	MSM	Barriers: experiencing human rights' violation Facilitators: high level of education, high level of knowledge about HIV, multiple sexual partners
53	(Lee <i>et al.</i> , 2015)	MSM	Barriers: low self-perceived risk for HIV (46.9%), fear of a positive result (42.0%), and lack of access to testing services (35.7%) Facilitators: to check one's health (23.3%), lack of condom use (19.7%), and availability of free testing (14.0%).
54	Strauss <i>et al.</i> (2015)	Adolescent	Barriers: stigma and discrimination, fear of a positive result, insufficient knowledge
55	Wei <i>et al.</i> (2014)	MSM	Barriers: stigma and discrimination, relationship type and partner characteristics, low perception of risk or threat, HIV is incurable or equals death, concerns of confidentiality, unaware that testing is offered for free, and name-based testing. Facilitators: engaging in high-risk sex, sense of responsibility for partner, collectivism, testing as a part of standard/routine medical care, MSM-friendly medical personnel, increased acceptance of gay/bisexual men by the general public, legal recognition and protection of homosexuals, and home self-testing.
56	Samrith <i>et al.</i> (2015)	HCP	Barriers: Poor knowledge about TB/HIV, lack of communication skills, absence of any target plan for TB patient referral for HIV testing, and fear associated with informing positive test results to the TB patients and the associated stigma.
57	Agusti <i>et al.</i> (2013)	GPs	Barriers: Lack of time and a need for training, both in the use of rapid tests (44.3% and 56.4%, respectively) and required pre- and post-test counselling (59.2% and 34.5%, respectively).
58	St. Lawrence <i>et al.</i> (2015)	Key informants & African American MSM	Barriers: feared knowing their HIV status, expressed concern about stigma and loss of confidentiality, and held beliefs indicative of medical mistrust.

59	Woodford et al. (2015)	Key population (MSM, transgender, FSW and IDUs) Key informants	<p>Barriers to HIV testing:</p> <ul style="list-style-type: none"> • Social-structural level: stigma, criminalisation and harassment, lack of supportive social norms for testing. • Health-care system level: mistreatment by staff, lack of cultural competence, lack of rapid and non-invasive HIV tests • Interpersonal level: fear of adverse social and familial consequences • Individual level: low HIV risk perception, risks outweigh benefits (IDUs), <p>Facilitators of HIV testing:</p> <ul style="list-style-type: none"> • Health-care system level: drug dependency treatment, Outreach and support services • Interpersonal level: Friends or peers living healthily with HIV. • Individual level: Accurate knowledge about HIV risk, testing, and treatment
60	Weihs and Meyer-Weitz (2015)	4 Studies <ul style="list-style-type: none"> • Black employees of a rural factory • HCW • Employees, mining industry • HCW 	<p>Barriers to HIV testing at workplace:</p> <p>Fear of compromised confidentiality, being stigmatised or discriminated in the event of testing HIV positive or being observed participating in HIV testing, and a low personal risk perception.</p>
61	Bhoobun et al. (2014)	Young adults (18-35)	<p>Barriers:</p> <p>Fear of testing positive, losing a job, being abandoned by a partner and rejected by family, and being unable to have children. Concerns about a lack of privacy or confidentiality and worrying that people who saw them being tested would assume that the tested person had HIV.</p> <p>Facilitators:</p>

			Being advised to do so by a doctor, partner, family member, or religious organisation. Concern about past exposures to HIV through sexual contact or through unsterile needles. Additionally, knowing that treatment was available.
62	De Allegri et al. (2015)	Men	Barriers: The distance to the closest CSPS. Facilitators: Attending some form of formal schooling, living closer to a CSPS (HIV testing centre) and household wealth.
63	Sison et al. (2013)	HCP	Barriers: Financial barriers, financial disincentives to offer routine screening, misperceptions about local informed consent laws, perceived stigma among patients, and belief that HIV testing was the responsibility of the health department.
64	Bien et al. (2015)	MSM	Barriers: Lack of privacy and confidentiality, lacked adequate staff training for providing MSM-specific care. Facilitators: Rapid HIV testing, gay-friendly HIV testing services.
65	Hong et al. (2012)	FSW	Barriers: Low perceived risk, don't know where to do HIV testing.
66	Deblonde et al. (2014)	Recently diagnosed HIV infected	Barriers: Low perceived risk, not feeling ill, being afraid of HIV disease, stigma and discrimination, breach of confidentiality, as well as practical and financial barriers
67	Wright et al. (2013)	African Americans who recently used cocaine	Barriers: Social mores and norms, fear of social costs and concerns about reputation and risk
68	Addis et al. (2013)	University students	Barriers: Fear of positive results, stigma and discrimination

69	Wong (2013)	Lay public multi ethnic	Barriers: Low perceived risk, not knowing where to get tested, fear of testing positive and fear of being stigmatised.
70	Pinheiro Júnior et al. (2015)	Transwomen	Barriers: Illicit drug use during sex, self-report of discrimination reduce HIV testing and not believing in the confidentiality of HIV test results.
71	Lahuerta et al. (2013)	Clients of FSW	Barriers: Fear of a positive result and lack of knowledge of where to access free and anonymous testing. Fear of HIV/STI-related stigma and discrimination. Low-risk perception.
72	Christopoulos et al. (2012)	ED patients	Barriers: Perception of Being at Low Risk, Only Want to Address Reason for ED Visit, Don't Want to Know, Confidentiality Concern, Potential Strain on Relationship. Facilitators: Curiosity/Assurance, Convenience/Opportunity, Perception of Being at Risk, Encouraged by Partner, Ensure Safety of Others and free testing
73	Guadamuz et al. (2015)	MSM	Barriers: Low risk perception, HIV stigma, concerns about HIV testing cost, afraid of needles and did not know where to get HIV tested.

Appendix C 1 (Quality assessment of quantitative studies)

Table I. Quality assessment of quantitative studies based on the tools used by (Louw et al., 2007; Wong et al., 2008; Roman & Frantz, 2013; Davids & Roman, 2014; Saab et al., 2016)

References	Quality assessment items – Quantitative					
	Was the sample likely to be representative of the study population?	Was a response rate mentioned within the study?	Was the instrument used reliable?	Was the instrument used valid?	Was it a primary data source?	Quality appraisal score
Yasin et al. (2013)	1	0	0	0	1	40%
Lee et al. (2015)	0	0	0	0	1	20%
Samrith et al. (2015)	0	0	0	1	1	40%
Agusti et al. (2013)	0	1	1	1	1	80%
Bhoobun et al. (2014)	1	0	1	1	1	80%
Hong et al. (2012)	0	0	0	1	1	40%
Deblonde et al. (2014)	0	1	1	1	1	80%
Addis et al. (2013)	1	1	1	1	1	100%
Wong (2013)	1	1	1	1	1	100%
Pinheiro Júnior et al. (2015)	0	0	0	0	1	20%

Guadamuz et al. (2015)	0	1	0	0	1	40%
Payne et al. (2006)	0	0	0	0	1	20%
Peralta et al. (2007)	0	0	1	1	1	60%
Moyer et al. (2008)	1	0	0	0	1	40%
Ma et al. (2007)	1	1	1	0	1	80%
Mills et al. (2011)	1	1	0	0	1	60%
Lopez-Quintero et al. (2005)	1	0	0	0	0	20%
Arbelaez et al. (2012)	0	1	0	0	1	40%
Korthuis et al. (2011)	0	1	0	1	1	60%
Mimiaga et al. (2009)	1	0	1	1	1	80%
Delva et al. (2008)	1	0	0	0	1	40%
Song et al. (2011)	0	1	1	0	1	60%
Ostermann et al. (2011)	1	1	0	1	1	80%
Dietz et al. (2008)	0	1	0	0	1	40%
Inungu (2002)	1	1	0	0	0	40%
Flowers et al. (2003)	0	1	0	0	1	40%

Mugisha et al. (2010)	1	0	1	1	1	80%
Forsyth et al. (2008)	0	1	1	1	1	80%
Mikolajczak et al. (2006)	0	1	0	0	1	40%
Burns et al. (2008)	0	1	1	1	1	80%
Stolte et al. (2007)	0	1	1	1	1	80%
Dukers-Muijrs et al. (2009)	0	0	1	1	0	40%
Heijman et al. (2009)	0	0	1	1	0	40%
Wong et al. (2012)	0	0	0	0	1	20%
Van Dyk and Van Dyk (2003)	0	0	0	0	1	20%
Bogart et al. (2010)	1	0	1	1	1	80%
Kharsany et al. (2010)	0	0	0	0	1	20%
Prestage et al. (2012)	0	0	0	0	1	20%
Partridge et al. (2009)	1	1	0	0	1	60%

^a Score: total score divided by the total number of items multiplied by 100.

Quality appraisal score: **Weak: 0-33.9%; Moderate: 34-66.9%; Strong: 67-100%**

Abbreviations: 0 = No/not reported; 1 = Yes

Appendix C 2 (Quality assessment of qualitative studies)

Table II. Quality assessment of qualitative studies based on CASP tools of qualitative research

Reference	Quality assessment items – Qualitative research									
	Was there a clear statement of the aims of the research?	Is a qualitative methodology appropriate?	Was the research design appropriate to address the aims of the research?	Was the recruitment strategy appropriate to the aims of the research?	Was the data collected in a way that addressed the research issue?	Has the relationship between researcher and participants been adequately considered?	Have ethical issues been taken into consideration?	Was the data analysis sufficiently rigorous?	Is there a clear statement of findings?	How valuable is the research?
Strauss et al. (2015)	Y	Y	Y	Y	C	Y	Y	C	Y	This study adds to the currently limited, but growing body of literature that unpacks the complex interrelationship between the underlying factors that influence young people's willingness to test, while providing insights which would aid in the development and implementation of policy targeting youth in South Africa.
Wei et al. (2014)	Y	Y	Y	Y	Y	N	Y	Y	Y	This was one of the few studies on HIV testing behaviours among Chinese MSM and was the first to explore barriers and

										facilitators to treatment and care among this population in China.
St. Lawrence et al. (2015)	Y	Y	Y	Y	Y	N	C	Y	Y	The study illustrates concerns among African American MSM about testing.
Woodford et al. (2015)	Y	Y	C	C	C	N	Y	Y	Y	The study can help to inform policy-makers and programme planners in their efforts to increase the acceptability and accessibility of HIV testing services for marginalised groups in India.
Sison et al. (2013)	Y	Y	Y	Y	Y	N	C	Y	C	The study suggested that providers are overwhelmingly willing to offer HIV testing routinely if they are able to be reimbursed.
Bien et al. (2015)	Y	C	C	Y	C	N	Y	C	Y	The study asserted that multi-level factors related to available testing technologies, stigma, service providers, and testing environments contributed to HIV/syphilis testing behaviours and preferences among MSM in this sample.
Wright et al. (2013)	Y	Y	C	Y	C	N	C	Y	Y	The study provided information that is critically important for developing new strategies to address the growing disparities in HIV and rapid growth of the epidemic among African Americans in rural areas.

Lahuerta et al. (2013)	Y	Y	Y	Y	C	N	Y	C	Y	The results of the study suggest that unsafe sex among clients in Escuintla could be attributed to numerous complex and interconnected gender, socio-cultural and individual level factors.
Christopoulos et al. (2012)	Y	Y	Y	C	Y	N	C	C	Y	The result of the study helped in assessing the possibilities of integrating HIV testing in ED.
Njosing et al. (2010)	Y	Y	C	Y	Y	Y	Y	Y	Y	The study highlighted health care providers take into consideration the complex choices TB patients are faced with during the decision making process to test for HIV during counselling.
(Njau et al., 2012)	Y	Y	Y	C	Y	N	C	C	Y	The study findings indicate that an effectively implemented HBCCT has the potential to increase uptake of HIV testing.
Lally et al. (2008)	Y	Y	Y	N	Y	N	Y	Y	Y	The study provides insight into a hard-to-reach population.
Myers et al. (2011)	Y	Y	C	C	C	N	Y	C	Y	This study has implications to make HIV testing a routine part of primary care.
McCoy et al. (2009)	Y	Y	Y	Y	C	N	Y	C	Y	The results of the study have important implications for universal screening programs and linkage to care after diagnosis.
Johnson et al. (2011)	Y	Y	Y	C	Y	N	Y	C	Y	This study has implications to revise HIV testing guideline especially for

										separate consent requirements.
Mahendra dhata et al. (2008)	Y	Y	Y	Y	Y	N	Y	C	Y	The study highlighted that TB patients evidently experienced multiple barriers that can deter them for HIV testing.
Schwarcz et al. (2011)	Y	Y	Y	C	Y	C	Y	C	Y	The study provided a window into the complexity of factors that lead to delays in testing in a diverse sample of late testers.
Manirank unda et al. (2012)	Y	Y	Y	Y	Y	N	Y	Y	Y	This is the first study in this context and the findings contribute to a better understanding of the barriers to implementing this approach.
Christians on et al. (2010)	Y	Y	C	C	C	Y	Y	Y	Y	Indicates that providing HIV-testing in a youth-friendly atmosphere is important, but administrative and communicative factors may function as barriers for being tested
Manirank unda et al. (2009)	Y	Y	Y	Y	Y	N	Y	Y	Y	This is the first qualitative community-based study on the barriers to VCT uptake among sub-Saharan African migrants in Belgium.
Beattie et al. (2012)	Y	Y	Y	C	C	N	Y	C	Y	The study identified personal, interpersonal and structural barriers which prevent many sex workers from accessing government managed HIV services.
Spielberg et al. (2001)	Y	Y	Y	Y	Y	N	Y	C	Y	This study goes beyond previous work to identify clear preferences among

										specific populations at risk for HIV that may increase test uptake.
Ford et al. (2004)	Y	Y	Y	Y	Y	N	C	C	Y	This study identified a number of obstacles in the way of increasing HIV testing in Indonesia. Both individual and community-based interventions may be needed to accelerate the use of HIV testing.
Dowson et al. (2012)	Y	Y	Y	Y	Y	N	Y	Y	Y	This study identified a number of possible reasons why MSM in the UK did not test earlier for HIV.
Gyarmathy et al. (2004)	Y	Y	Y	C	Y	N	C	C	Y	This study points out the urgent need for HIV and hepatitis prevention in drug treatment programs in Hungary
Prost et al. (2007)	Y	Y	Y	Y	Y	N	Y	Y	Y	This study reveals that the community based VCT is acceptable and it also prove that stigma remains an important barriers for HIV testing in the African community in the UK
MacPhail et al. (2008)	Y	Y	Y	C	Y	N	Y	Y	Y	This study points out that participants know the importance of knowing one's status, however, there are many perceived barriers to accessing VCT.
Nunn et al. (2012)	Y	Y	Y	Y	Y	C	Y	Y	Y	This study suggests that African Americans undergoing rapid HIV testing at Philadelphia's public health clinics preferred rapid testing to conventional testing.

Simmons et al. (2011)	Y	Y	Y	Y	Y	N	Y	Y	Y	This study indicates that the implementation of routine HIV testing in primary care practices appears to be an acceptable however, some primary care health professionals do not yet have a clear definition of routine HIV testing.
Abbreviations: N = No/not reported; C = Can't tell; Y = Yes										

Appendix C 3 (Quality assessment of Mixed Methods)

References	Quality assessment items – Mixed methods research									
	Screening		Qualitative strands		Quantitative strands		Integration			How valuable is the research?
	Was there clear research questions for the study?	Was the data collected in a way that addressed the research issue?	Were the sources of qualitative data relevant to address the research question?	Has the relationship between researcher and participants been adequately considered?	Were participants recruited in a way that minimizes selection bias?	Were there complete outcome data and, when applicable, an acceptable response rate?	Was the mixed methods research design relevant to address the qualitative and quantitative research questions?	Was the integration of qualitative and quantitative data relevant to address the research question?	Was appropriate consideration given to the limitations associated with this integration?	
De Allegri et al. (2015)	Y	Y	Y	N	Y	Y	Y	Y	N	This study provides evidence that HIV testing among males remains unacceptably low. Low uptake of the available services results from a mixture of health system factors, indicating general barriers to access, and

										motivational factors, such as one's own knowledge of the disease and perception of risk.
Namakhoma et al. (2010)	Y	Y	Y	N	Y	Y	Y	Y	N	This study confirms that health workers face challenges to accessing testing, counselling and treatment.
Bwambale et al. (2008)	Y	Y	Y	N	Y	Y	Y	C	N	This study shows that VCT utilisation among men was low. The study also identified barriers faced by men in western rural Uganda.
Bollini et al. (2002)	Y	Y	Y	N	C	N	Y	Y	N	This study highlighted the complexities behind HIV prevention and management in prisons.
Abbreviations: N = No/not reported; C = Can't tell; Y = Yes										

Appendix C 4 (Quality assessment of Systematic Review)

Table IV. Quality assessment of Systematic Review based on CASP tools of systematic review

References	Quality assessment items – Systematic review									
	Did the review address a clearly focused question?	Did the authors look for the right type of papers?	Do you think all the important, relevant studies were included?	Did the review's authors do enough to assess the quality of the included studies?	If the results of the review have been combined, was it reasonable to do so?	What are the overall results of the review?	How precise are the results?	Can the results be applied to the local population?	Were all important outcomes considered?	Are the benefits worth the harms and costs?
Weihl and Meyer-Weitz (2015)	Y	Y	Y	C	N/A	Fear of compromised confidentiality, being stigmatised or discriminated in the event of testing HIV positive or being observed participating in HIV testing, and a low personal risk perception. an awareness of an HIV-positive status	C	N	Y	Y

Abbreviations: N = No/not reported; C = Can't tell; Y = Yes; N/A = Not applicable

Appendix D the qualitative findings & the quotes from the interviews transcripts

Qualitative findings			
Themes	Sub-themes	Participants (Codes)	Quotes from the transcripts
HIV testing facilitators	<i>Engaging in risky behaviours</i>	(Ganp)	<p>“In SA people who come to get tested come because they have engaged in risky behaviour...etc”</p> <p>“I think the most important thing is the individual’s desire to ensure that he/she is not infected...etc”</p>
		(Wnap)	<p>“Commonly most of the young males who come to us at the VCT centre seeking our services are those who have travelled abroad and got involved in risky behaviour ...etc”</p>
	<i>Spreading awareness to counter misconceptions</i>	(Bnap)	<p>“An encouragement would be to spread awareness about what the disease is, how it’s transmitted, how it’s not transmitted. They could be at risk and they might not know it.”</p> <p>“Knowing the risk factors when we spread awareness of what are the risk factors and the high risk activities, people come forward and say, “Ok I want my HIV test done.”</p> <p>“Letting them know that they have a right by telling them that there is treatment available and these are the resources available...etc”</p>
	<i>Doubt about a partner’s status</i>	(Ganp)	<p>“Most females come to us because their husbands had travelled a lot and they have suspicions that they were engaged in extra-marital sexual relationships...etc”</p>
	<i>Attitude towards personal health status</i>	(Ganp)	<p>“How much the individual cares about his/her health in general since, the more a person cares about his/her health, the more he/she is willing to get tested...etc”</p>

			(Bnap)	“Taking the first step toward better health, that is one thing we have seen in the shopping malls when we advertise it...etc”
			(Bnap)	“VCT helped a lot as when we advertise it we tell people, “You will be tested without giving any names or ID; it’s anonymous.”
			(Ganp)	“From my experience many men get tested voluntarily before taking the pre-marital mandatory testing to make sure they are not infected...etc”
HIV testing barriers	Barriers at a social and individual level	Social stigma	(Bnap)	“Stigma is the first factor that makes people choose not to get tested and keeps them back.”
			(Ganp)	“I think the most important barriers is the stigma related to HIV/AIDS. This is because HIV/AIDS until now in many places around the world, including Saudi Arabia, is stigmatised...etc” “In Saudi Arabia HIV is also widely known to be transmitted through forbidden sexual relationships. Therefore, this perception about HIV/AIDS has caused the reluctance...etc”
			(Wnap)	“The stigma related to HIV/AIDS acts as an important barrier, especially in our society.”
		Low level of awareness and knowledge about HIV/AIDS	(Bnap)	“There is a lack of awareness about HIV/AIDS and a fear that there is no treatment or ‘cure’. Yes, there is a treatment, but only to keep your health good; there is no cure. So, if I was diagnosed with HIV, what would happen to me? My future is over!...etc” “In terms of knowledge related to HIV testing services: a lot of them don’t know that VCT centres are there; they don’t know they can go and get tested without ID.”
			(Ganp)	“The low level of HIV related knowledge also accounts for a big share of the low testing. As an individual, I think I am healthy and I don’t

				have symptoms so why should I bother myself and go to get tested!”
			(Wnap)	“The lack of knowledge about HIV/AIDS and the huge misconceptions around HIV/AIDS are also common barriers in SA. For example, a lot of people till now think that HIV can only be transmitted through sexual intercourse.”
		Fear of a positive result and its consequences	(Bnap)	“If they find out that they are HIV positive then what will happen? Then their family will know, they will lose their jobs and what if they’re married? What if the wife or the husband wants to leave?”
			(Gnap)	“The fear of positive results could also count as a barrier to getting tested for HIV.”
		Lack of public confidence in the confidentiality of HIV testing services	(Wnap)	“I think the most common barrier is that people always think that the HIV test is not confidential.”
	Barriers concerning the health system and health care professionals	Stigma induced by the health system and health care professionals	(Bnap)	“Make it confidential because you don’t want to spread the rumour about because there are some doctors who don’t want to treat or deal with HIV cases as there is a stigma from the health care facilities,...etc” “Then, again you see how much the country wants to talk about HIV, how much you want to disclose it”
			(Wnap)	“I think also stigma has affected how health care workers deal with the disease. For instance, many physicians avoid talking about HIV/AIDS with their patients. They also don’t direct suspected individuals to us.”
		Difficulties in reaching out to high-risk individuals	(Bnap)	“It is low because it’s difficult to reach out to people. Because we depend on our work circle which makes us wait for people to come to us...etc”

			(Wnap)	“The awareness campaigns were also affected by the complicated procedures to get permission.”
			(Ganp)	“They didn’t reach out widely to people as we don’t see any increase in the uptake of HIV testing in the VCT centres.”
		Health care professionals’ lack of basic knowledge about handling and counselling HIV patients or potentially HIV infected individuals	(Bnap)	<p>“They are scared!! Although they are health care professionals, some of them are scared and they don’t want to deal with HIV...etc”</p> <p>“From my experience, when we do workshops to health care professionals about HIV/AIDS most of them want HIV to be centred in one place.”</p> <p>“You know it is a chronic infection so, either it would be a big hassle for them to have it in their own health care centres, which it should not be because it just requires standard precautions like everywhere else, or they don’t have the capacity. Many of them are afraid and forget how it is transmitted...etc”</p> <p>“Primary health care centres: many patients go straight there but many of the health workers, if the lab test says someone is HIV positive, they don’t know what to do...etc”</p>
			(Ganp)	“Many doctors don’t have basic counselling skills and they don’t know how they should deal with any suspected HIV case.”
		Competing clinical priorities	(Bnap)	“The doctors always tend to ignore preventive measures because they say we don’t have time to ask a little bit extra or give a suggestion to visit certain places to seek advice.”
			(Ganp)	“Doctors generally don’t spend enough time with their patients to advise them about preventive measures in general as they feel they always have other duties which are much more important than prevention consultations.”

			(Wnap)	<i>"In general, most physicians don't have time to spend in preventive activities."</i>
		Inadequate number of staff and VCT centres	(Wnap)	"In terms of the VCT clinics, we face a lot of logistical problems such as having few workers," he also added, "and a lack of qualified counsellors." "We also lack staff in general which has held us back in many aspects including awareness campaigns"
			(Ganp)	"We should make sure that there is an adequate number of VCT clinics in each city and an adequate number of counsellors." "There are no STDs clinics or VCT clinics in most of the health care centres."
		<i>Inadequate publicity about the HIV testing centres and their services</i>	(Ganp)	"Although VCT clinics exist as a part of the NAP centres in the country, it's not working effectively. For example, a lot of people don't know where they are located and there are no advertisements about the VCT and its services."
			(Bnap)	"The second thing is knowledge related to HIV testing services: a lot of them don't know that VCT centres are there, they don't know they can go and get tested without ID."
HIV/AIDS related knowledge and awareness	<i>Reasons for the low level of HIV/AIDS related knowledge and awareness</i>	Efforts to increase awareness are limited	(Bnap)	"Awareness campaigns do happen but they should be on broader scale. Maybe this is because it is a low priority area, that's why!" "You see what happened with the Corona virus outbreak. When a lot of deaths start happening the community wanted to know!! But who will give them the information, of course: it's the Ministry of Health's (MOH) responsibility...etc"
			(Ganp)	"The lack of awareness campaigns that target young people mean a lot of people don't have enough information about HIV. So, if something wrong happens, he/she starts to

				panic and doesn't know what to do and where to go...etc"
			(Wnap)	"I think there is a lack of proper awareness campaigns at all levels, such as the media and all its branches, educational institutes (schools, universities)."
		Messages to the public are ineffective	(Bnap)	"That's how you get people to know about it, you have to jolt them a little bit otherwise they will say ok yah!" "Do you know people in general not scared of Hepatitis! Every time I get a case here I ask just generally, "Do you receive the Hepatitis B vaccine?" Most of them say NO even though the route of transmission is the same and even though you need a very miniscule amount to be infected compared to the HIV virus but people are not scared about Hepatitis...etc" "I also believe the way we tell the people also makes a difference."
			(Ganp)	"I think there is a lack of awareness through the various form of media. Sometimes, even if there is an awareness activity it lacks transparency as it's characterised by ambiguity and it's underestimating the problem."
		Young people in Saudi Arabia do not educate themselves	(Ganp)	"Part of the problem is caused by most of young people being ignorant of self-education about sexual health matters, unless something wrong has occurred or they have practised any risky behaviour so, at that time judgment is clouded."
			(Wnap)	"I think there is a lack of self-education among most of the individuals in our society about health related matters in general."
		The curricula of educational institutes lack sexual health topics including HIV/AIDS	(Ganp)	"There is a lack of sexual health topics in all educational curricula, including those of schools and universities, as sexual health and sexual issues are still taboo in our society."

Action plan to increase the uptake of HIV testing in SA	Increasing the level of awareness about HIV/AIDS	The message to the public needs to be more clear and transparent	(Bnap)	<p>“You let them know that, ok look, this is the problem: there is no cure, there is prevention and you can prevent yourself and get your status known so, this helps them. Unless we don’t give them this information clearly and be open about it...etc”</p> <p>“Again, as you see what happened with the Corona virus, all the people were upset. Why didn’t you tell us before and we don’t know what to do...etc”</p>
			(Ganp)	<p>“It is also important to prepare and distribute leaflets and brochures that contain very clear information about HIV/AIDS and the VCT services.”</p>
	HIV/AIDS needs to be integrated in the curricula	(Bnap)	<p>“So, if we have it included in the curriculum parents won’t get uncomfortable with it because they know this is part of the conclusion: growing up, teenager’s stuff, taking care of yourself and your health and not only keeping HIV but KEEP ALL OF THEM. So, as a general health topic, parents at home would also be comfortable. Okay, my child is getting information about general health...etc”</p>	
		(Ganp)	<p>“It’s also important to include AIDS and other STDs in school curriculums so, this will help young people know the right information from trusted sources.”</p>	
	Advertising the VCT centre locations and services	(Bnap)	<p>“It’s really by word of mouth and by a lot of awareness about the VCT centres we can get the number of uptakes to increase. For example, we received two people yesterday out of the blue. Those were foreigners. They came and said we’ve heard and we want to get the test done and know how we can get it done. They heard somebody talking about it and they came forward.”</p>	

	Modifying and enhancing the HIV testing services	Modifying and enhancing the HIV testing services	(Bnap)	<p>“If we don’t keep “HIV testing and counselling centre”, if we simply keep “Testing and counselling centre” you go in and you meet a counsellor in a general talk about different infectious diseases...etc”</p> <p>“I think we are, like, very reserved. Until now we are in the corner when we need to be in the centre of all the activities that are happening and we need to have a broader concept, not only HIV. If we have general testing and counselling centres...etc”</p>
			(Ganp)	<p>“I think it would be better if we could develop STD clinics rather than VCT clinics as this might decrease the effect of stigma related with HIV/AIDS. As well, it will help in addressing other important STDs”</p>
			(Wnap)	<p>“It is also noted that stigma is affecting our service because people don’t want to walk into our department so I think, if we could make the clinic for sexually transmitted diseases in general and HIV testing is one of them, it would help a lot.”</p>
		VCT centres’ locations	(Ganp)	<p>“That will help, especially if these clinics are located next to the places that young people gather such as gyms, cafes and shopping malls.”</p>
			(Wnap)	<p>“I also think the VCT clinics should be located next to where young people gather.”</p>
			(Bnap)	<p>“We can have VCT centre here but again it is a health sector so, people maybe hesitate to walk in to the centre but luckily we have a lot of departments in this building so, you could be walking to Hepatitis, vaccination or anything so, it is a quiet area and that helped a lot. But places like King Saud Hospital’s VCT centre,</p>

				<p>however; almost everybody knows that it's an infectious disease hospital...etc"</p> <p>"If we have it in more places which are not in health related centres that will dramatically increase the uptake."</p>
		Developing VCT centres for young people	(Bnap)	"Having the VCT centre in areas where young people go, like gyms, and you could have them in family oriented buildings. I mean, you should cater the VCT for every part of the society. So, you know where the youth goes and you could have the centre there...etc"
			(Ganp)	"I think if we could develop a VCT clinic that targets young people, it would help a lot in addressing this group of individuals."
			(Wnap)	"As in many countries all over the world there are clinics 'VCT, STDs' that focus on young people. I think this also could help in increasing awareness about the disease, as well as increase awareness about sexual health in general. In addition, I think this kind of clinic would be more acceptable to this group of people."
		Increasing the use of Mobile VCT (MVCT)	(Bnap)	<p>"Mobile VCTs help us a lot!! Because we choose different locations and we see a lot of people in the mobile VCT because you're not waiting for them to come but you're providing the service where they are...etc"</p> <p>"Because we don't only advertise the test but you can walk in, take information and simply walk out without even getting the test. But a lot of people opt for the test."</p>
			(Ganp)	"We should also increase the number of HIV testing campaigns through mobile VCT."
			(Wnap)	'Although it's difficult to judge this in our centre in Makkah as the Mobile VCT is still new as it's just launched 6 month ago, in Jeddah city. Mobile VCT started working 10 years ago

				which shows greater usage of this kind of VCT rather than traditional VCT from young people, both male and female...etc”
		Training the staff and other health care professionals	(Bnap)	“So, if you educate doctors, nurses and other health professionals randomly periodically as they should always be reminded it’s a chronic infection, this how it spreads, when you need to isolate the patient and, as long as the patient with you, this is what you have to do. It would help!”
			(Ganp)	“The MOH should provide training courses and workshops to all health care professionals.” “In terms of VCT centres, we need first to ensure that these VCT clinics are well equipped and the counsellors are well trained and qualified.”

Appendix E (the questionnaire)

A. HIV/AIDS related knowledge

Please answer the following 12 questions to the best of your knowledge by circling the character that determines your answer to each statement.

For each statement, please circle “True” (T), “False” (F), or “I don’t know” (DK). If you do not know, please do not guess; instead, please circle “DK.”

NO		True	False	I don't know
1	A person can be infected with HIV and not show signs of disease for many years	T	F	DK
2	A person can get HIV by sharing a meal with someone who has HIV	T	F	DK
3	Once infected with HIV a person can potentially infect others for the rest of their life	T	F	DK
4	All pregnant women with HIV will pass the virus to their baby	T	F	DK
5	People who have been infected with HIV quickly show serious physical signs of being infected	T	F	DK
6	There is a vaccine that can prevent people getting HIV	T	F	DK
7	A person can become infected with HIV by having unprotected sexual intercourse	T	F	DK
8	Mosquito’s bites could transmit HIV	T	F	DK
9	A person will not get HIV if they are taking antibiotics	T	F	DK
10	AIDS-related illnesses are the leading causes of death among 18-25 years old in Saudi Arabia	T	F	DK
11	Taking a test for HIV one week after the exposure to HIV virus should tell a person if they are infected	T	F	DK
12	HIV can be cured if diagnosed early	T	F	DK

B. Risk perception

The following section; contain a number of statements with which some people agree and others disagree. Please rate how much you personally agree or disagree with these statements-how much they reflect how you feel or think personally.

For each statement, please put (x) in the allocated box according to your personal judgment about each statement. Where (1) indicate "Strongly agree" and (5) indicate "Strongly disagree".

No.		Strongly agree 1	Agree 2	Neither agree nor disagree 3	Disagree 4	Strongly disagree 5
13	I am very healthy so my body can fight off an HIV infection.					
14	I am too young to get an HIV infection.					
15	I am not at risk of HIV.					

C. HIV testing

16 **Have you ever had an HIV test?**

Yes..... () if

Yes go to Q.17 and only skip Q.18

No..... () if No

go to Q.18 and only skip Q.17

17 **Which of these would you say was the MAIN reason for getting an HIV test?**

(Tick only one)

- A. Worried that you may have been infected.
- B. Because you practised unprotected sex.
- C. Because a doctor, nurse or other health care professional asked you to
- D. Because sex partner asked you to
- E. For hospitalisation or surgical procedure
- F. For employment purposes
- G. For military induction, separation, or during military service
- H. Because of pregnancy

- I. Mandatory pre-marital test
- J. Other reason. Please specify

18 If you have not been tested for HIV, which ones of these would you say is the MAIN reason why you have not been tested?

(Tick only one)

- A. It's unlikely you've been exposed to HIV.
- B. Fear of a positive result consequences.
- C. You were worried your name would be reported to the government if you tested positive.
- D. You don't trust the results to be confidential.
- E. No one had offered you an HIV test.
- F. You were afraid of losing friends and family, if people knew you were HIV positive.
- G. You were afraid of being discriminated against and stigmatised.
- H. You didn't know where to get tested.
- I. You need to travel a long distance to get tested.
- J. Testing clinics don't open at the right times.
- K. Testing clinic staff's attitude.
- L. You won't get the result on the testing day.
- M. Fear of needles.
- N. Long waiting time at testing clinic.
- O. Other reason. Please specify.....

19 Would you be willing to be tested for HIV next year?

- 1. Strongly willing
- 2. Willing
- 3. Uncertain
- 4. Unwilling
- 5. Strongly unwilling

D. Attitude toward HIV testing

The following section contains a number of statements with which some people agree and others disagree. Please rate how much you personally agree or disagree with these statements-how much they reflect how you feel or think personally.

For each statement, please put (x) in the allocated box according to your personal judgment about each statement. Where (1) indicates “Strongly agree” and (5) indicates “Strongly disagree”.

No		Strongly agree 1	Agree 2	Neither agree nor disagree 3	Disagree 4	Strongly disagree 5
20	HIV testing is not really confidential.					
21	HIV test information is kept very confidential by medical staff.					
22	My family would support me if I decided to be tested for HIV.					
23	I would not want anyone to know if I got an HIV test.					
24	My friends would not look down on me if I were tested for HIV.					
25	Anyone who is tested for HIV is disgusting.					
26	People who test positive will be stigmatised by the community.					
27	People assume that everyone who is tested for HIV is infected with HIV.					
28	My parents would be upset if they knew I was planning to get tested for HIV.					
29	Admitting that you should be tested for HIV means that you have engaged in immoral behaviour.					
30	My friends would support my decision to get an HIV test					

31	I am afraid that if I were tested for HIV, my name would go into public records.					
32	HIV test gives accurate results.					
33	It would be embarrassing to get tested for HIV.					
34	I would not consider getting an HIV test because I would be asked about things I have done that could get me into trouble.					
35	I can talk to my friends about making medical decisions.					
36	I would be comfortable talking to an HIV counselor about personal behaviours that place me at risk of HIV infection.					
37	People would assume I have HIV if I decided to get tested.					
38	My friends would look down on me if I were tested for HIV.					
39	My friends would not treat me any differently if I were tested for HIV.					
40	I am afraid someone would find out I was tested for HIV.					
41	I would be embarrassed if my friends found out I had decided to have an HIV test.					
42	I would not get tested for HIV because I would be asked information that was too personal.					
43	I trust the HIV test counselors and nurse to keep my information confidential.					
44	I do not have time to get an HIV test.					
45	It would not bother me if someone I know sees me going to get an HIV test.					

46	I could easily discuss HIV testing with my family.					
47	I would not get tested for HIV because I am afraid of the consequences of a positive result.					
48	I would not go for an HIV test if I had to wait more than a day for the results.					
49	I do not know where I can get tested.					
50	The way staff at HIV testing centre treat people when they get tested puts me off having an HIV test.					
51	Availability and accessibility of HIV related health care services encourage me to get an HIV test.					
52	I would get an HIV test if it was free.					
53	I would not consider getting an HIV test because people who test positive would be treated differently by employers.					
54	I would not consider getting an HIV test because I am afraid of the needle.					
55	I would get an HIV test because it will put my mind at rest.					
56	I would not consider getting an HIV test because my behaviour puts me at a very low risk.					

Appendix F (Topic list guide)

Interview with HCPs

- The factors that influence HIV testing uptake among young people aged (17-25) years
 - Facilitators.
 - Barriers
- The low level of HIV/AIDS related knowledge and the huge misconceptions about HIV/AIDS: Why, how it could be averted, what could be done to increase the awareness?
- Favourable attitude toward HIV testing but low testing.
- In term of HCPs: what are the challenges they faced that affect HIV testing uptake?
- Differences across genders in term of Knowledge, attitude, risk perception and the uptake of HIV test.
- The impact of stigma.
- The impact of youth friendly HIV/AIDS health related services.
- What is the issues that required alterations in the National AIDS Program?