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LIST OF ACRONYMS USED IN THE STUDY

ADF	Asymptotically Distribution-Free
AGFI	Adjusted Goodness-of-fit Index
AIDS	Acquired Immune Deficiency Syndrome
ANOVA	Analysis of Variance
BSS	Behavioural Surveillance Survey
CD4+	Cluster of differentiation
CDC	Centers for Disease Control
CFA	Confirmatory Factor Analysis
CI	Confidence Interval
CNS	Central Nervous System
CSA	Central Statistical Agency
CSWs	Commercial Sex Workers
CVI	Content validity Index
DBU	Debre Berhan University
DEFF	Design Effect
DF	Degree of Freedom
DNA	Deoxy Ribo Nucleic Acid
EDHS	Demographic and Health Survey
EFA	Exploratory Factor Analysis
ELISA	Enzyme-Linked Immuno-absorbent Assay
FHAPCO	Federal HIV/AIDS Prevention and Control Office
FHI	Family Health International
FMOE-	Federal Ministry of Education
FMOH	Federal Ministry of Health
GFI	Goodness-of-fit index
GLS	Generalized Least Square
gp120	Envelope glycoprotein
HAART	Highly Active Anti-Retroviral Therapy
HBM	Health Belief Model

HIV	Human Immunodeficiency Virus
HTBS	HIV Testing Belief Scale
HTC	HIV Testing and Counseling
KMO	Kaiser-Mayer-Olkin
ML	Maximum Likelihood
PAF	Principal axis factoring
PAHO	Pan American Health Organization
PGL	persistent generalised lymphadenopathy
PLWHA	People Living with HIV AIDS
PLWHAs	People Living with HIV AIDS
PMTCT	Prevention of Mother To Child Transmission
RHBs	Regional Health Bureaus
RMSEA	The Root-Mean-Square Error of Approximation
RNA	Ribo Nucleic Acid
SD	Standard Deviation
SEM	Structural Equation Modeling
SPSS	Statistical Packages for Social Sciences
SRMR	Standardised Root Mean Square Residual
TB	Tuberculosis
TPB	Theory of Planned Behaviour
TRA	Theory of Reasoned Action
TTM	Trans Theoretical Model
UNAIDS	Joint United Nations program on HIV/AIDS
UNFPA	United Nations Population Fund
UNICEF	United Nations International Children's Fund
UNISA	University of South Africa
VCT	Voluntary counseling and testing
WHO	World Health Organization
WLS	Weighted Least Squares

LIST OF ANNEXURES

CHAPTER 1

ORIENTATION TO THE STUDY

1.1   INTRODUCTION

This chapter in general provides an overview and introduction to the study. It explains the orientation to the study through a step-by-step presentation of the reasons why this research was conducted, information on sources for research problem, background to the research problem, and statement of research problem. It also specifies the aim of the research, central research questions, scope and significance of the study, over all structure of the thesis and other associated issues. The research design and methods are briefly discussed. However, given the importance and scale of the information to be discussed under the methodology, issues that were related to research design and methodology including sampling, data collection and analysis are presented in more detail in Chapter 3.

1.2   BACKGROUND INFORMATION ABOUT THE RESEARCH PROBLEM

In this section, the source of the research problem and background to the research problem are presented and discussed.

1.2.1 The source of the research problem

There were two major sources from which the research problem was crafted. The first key information source that triggered the research question was that HIV testing uptake in sub-Saharan Africa is not enough to reach people who need HIV care, support and treatment services as reported by UNAIDS and national HIV/AIDS reports. For example, only 50% of adults aged greater than 15 years are currently getting antiretroviral therapy in Ethiopia (FHAPCO & FMOH 2014:24). This is mainly attributed to lack of awareness of one's HIV status in seeking and accessing HIV care, support and treatment services. In Ethiopia for example, only 21% of young women and 20% of young men aged 15–24 have received an HIV test and know their HIV test results, which is the lowest by any standard (CSA & ICF International 2011:207-208). The overall picture in Sub-Saharan

African countries is not different from Ethiopia. The antiretroviral therapy coverage in sub-Saharan Africa is only 37% (UNAIDS 2014:2). In sub-Saharan Africa, only half (51%) of people living with HIV/AIDS know that they are HIV infected and the remaining half did not know that they are living with HIV/AIDS (UNAIDS 2013:50). This motivated the researcher look into why young people for example university students are not getting tested for HIV.

The second source of information for the development of research problem was from the body of the literature that showed that there were not enough studies that analysed factors that contributed to low coverage of HIV testing especially using health behaviour theory and model in systematic way especially in Ethiopia. One of the key problems that the investigator looked at were studies conducted on analysing HIV testing behaviour using the Health Belief Model (HBM) were not comprehensive enough, and only four out of the six constructs were addressed in most studies. Cues to action and self-efficacy were not studied in great deal. Along with this, the investigator of the study has also learned that there was no theory or model based standard scale or questionnaire that can be used to assess HIV testing behaviour or intention in the Ethiopian context.

1.2.2 Background to the research problem

Ethiopia, located in the sub-Saharan African region, is the second most populous nation in Africa. According to the State of the World's Children 2014 report by United Nations Children's Fund (UNICEF), the Ethiopian population is around 94 million (UNICEF 2014). The country's health sector is managed by a Federal Ministry of Health (FMOH) at national level and seven regional states health bureaus (RHBs) and two city council administration health bureaus (Addis Ababa and Dire Dawa) at regional state level.

Ethiopia is one of the sub-Saharan African countries strongly affected by HIV/AIDS. According to the Ethiopian Demographic and Health Survey conducted in 2011, the national adult HIV prevalence is 1.5% (CSA & ICF International 2011: 235). The overall prevalence of HIV among young people age 23-24 years is 0.9% (CSA & ICF International 2011:234). According to 2012 Federal HIV/AIDS Prevention and Control Office (FHAPCO) report, application of effective and feasible preventive interventions to avert HIV infection, use of highly active anti-retroviral therapy (HAART), and sustained global and national commitment have resulted in successful control of the epidemic in

the country. Although much is achieved in the fight against HIV/AIDS in Ethiopia, FHAPCO and FMOH report showed that much should be done in order to sustain the gains in this regard (FHAPCO & FMOH 2012).

According to Ethiopian Federal Ministry of Education (FMOE) report, there are thirty-one public universities located in the various regional states and cities of Ethiopia [Federal Ministry of Education (FMOE 2015)]. About 294,357 undergraduate students were enrolled in these universities during 2012/13 Ethiopian academic year (FMOE 2013:57).

According to the Joint United Nations Programme on HIV/AIDS (WHO, UNAIDS & UNICEF 2011:23) report, sub-Saharan Africa is home to 68% of all people living with HIV and 70% of all people who are newly infected with HIV globally. The median number of HIV tests per 1,000 adults in the population is 82 for 43 sub-Saharan African countries for which data were reported for 2010 (UNAIDS 2011:77). The UNAIDS (2011:99) report also indicated that only 49% of adult and children eligible for anti-retroviral therapy (ART) in sub-Saharan Africa are started on ART. The 2012 UNAIDS report indicated that HIV testing coverage among adult population in 14 Sub Saharan African countries has significantly improved. However, according to the same report, HIV testing rate is lower in men than women. Most of the countries for which demographic and health survey data is available, HIV testing coverage is less than 25% (UNAIDS 2012).Lack of knowledge of serostatus by people living with HIV is a major obstacle to realising universal access to treatment and prevention [World Health Organization (WHO), Joint United Nations Programme on HIV/AIDS (UNAIDS), and United Nations International Children's Fund (UNICEF) 2011:79].

Young people constitute the segment of the population that is most vulnerable to HIV/AIDS. Around 50% of HIV transmission occurs among youth aged 15-24 years. Lack of knowledge about HIV/AIDS, lack of education and life skill, poor access to health services and commodities, early sexual debut, early marriage, sexual coercion and violence, trafficking and growing up without parents or other forms of exploitation and abuse are the most important factors that make young people vulnerable to HIV/AIDS (WHO 2006b:2).

HIV testing is a critical entry point to prevention, care, treatment and support services. In Ethiopia, only 21% of women and 20% of men aged 15–24 have received an HIV test and know their results (CSA & ICF International 2011:207-208).

There are few studies conducted on HIV testing and counselling among university students in Ethiopia. These studies were retrospective cross-sectional in nature and mostly were not health education theory/model based. A study conducted among Addis Ababa University students revealed that around 34% of students are sexually active during the survey (Regassa & Kedir 2011:834). A study conducted among university students in North western Ethiopia by Addis, Yalew, Shiferaw, Alemu, Birhan, Mathewose and Tachbele (2013:714) showed that 86.3% of students had adequate knowledge on voluntary counseling and testing (VCT) and 73.3% of them had positive attitude towards VCT. The same study also revealed that 61.8% of students have had HIV testing in the past. Another study conducted in another Ethiopian university found that 58.5% have received HIV testing which is closer to the previous one (Tsegay, Edris & Meseret 2013). A different study conducted among students attending in colleges of Harari state in Ethiopia showed that 52.8% of the students have been tested for HIV (Dirar, Mengiste, Kedir & Godana 2013:93).

1.3   RESEARCH PROBLEM

There are few studies regarding applications of behavioural models/theories (specifically of HBM) to understanding predictors of HIV testing intentions and HIV testing behaviour in Ethiopia resulting in lack of adequate knowledge in this regard. In particular, there are few studies conducted on understanding factors associated with HIV testing and counseling among university students in Ethiopia which mostly lacks health behaviour theory/model foundations as a conceptual framework. There was also no standardised instrument or scale that can be used to measure health belief factors that can further be used to predict HIV testing intentions or behaviour in Ethiopian university students' context and beyond. Moreover, there are limited studies that included all the constructs of Health Belief Model (HBM) especially of 'cues to action'.

1.4   AIM OF THE STUDY

1.4.1   Research purpose

The aim of this research is: (1) to develop HIV testing Health Belief Scale (HTBS) that contains all constructs of HBM that could be used for analysing and predicting HIV testing intentions and behaviour and, (2) to analyse HIV test intentions and HIV testing practices among university students based on the HBM in order to contribute to the knowledge gap regarding HIV testing behaviour.

1.4.2   Research objectives

General objective

- The general objective is to develop HTBS in the Ethiopian context; and analyse HIV testing practices and intentions among university students.

Specific objectives

The specific objectives of this study are to:

1. Develop HIV testing belief scale (HTBS) to measure HIV testing practice and HIV testing intentions in the Ethiopian youth context. The following null-hypothesis were tested along with this objective:

   ▪ Each of the seven sub-scales included in the final HTBS (six constructs of HBM and HIV testing intentions) exhibit a Cronbach's alpha value of <0.70
   ▪ Exploratory factor analysis does not produce a six-factor scale with at least three items with a factor loading of 0.40 or greater for each item under the sub-scales
   ▪ Confirmatory factor analysis does not confirm the fact that the proposed seven sub-scales in the HTBS don't fit a sample data (GFI < 0.90, significant chi-square test and RMSEA >0.08)

2. Analyse predictors of HIV testing behaviour/intentions in the context of HBM among university students. The following hypotheses were tested along with this objective:

- Socio-demographic variables are not associated with HIV testing intention and recent history of HIV testing
- Level of knowledge about HIV/AIDS is not associated with HIV testing intention and recent history of HIV testing
- Level of perceived severity is not associated with HIV test intentions and recent history of HIV testing
- Perceived susceptibility is not correlated with HIV test intentions and recent history of HIV testing
- Level of perceived benefit don't predict HIV test intention and recent history of HIV testing positively
- Level of self-efficacy don't predict HIV test intention and recent history of HIV testing positively
- Level of cues to action regarding voluntary HIV counselling don't predict HIV test intention and recent history of HIV testing positively
- Level of perceived barrier is not associated with HIV test intentions and recent history of HIV testing

1.5   SIGNIFICANCE OF THE STUDY

This study developed HIV testing belief scale (HTBS) using a step-by-step application of qualitative study, literature review, experts review, exploratory factor analysis on sample data and confirmatory factor analysis on separate large sample data. The scale can further be used as instrument for future studies that will look into HIV testing behaviour among university students and youth in general. The present study has further analysed the factors that can contribute to HIV testing behaviour among university students in order to contribute to narrowing the knowledge gap regarding HIV test seeking behaviour among Ethiopian university students. This study can also be used to plan further studies in the area. Moreover, the results of this study can be used as a clue for planning health education and promotion activities related to HIV testing for university students and similar age groups of young peoples.

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1.6   DEFINITIONS OF TERMS

The following key concepts that were used in different sections of this study are defined as follows:

Perceived susceptibility: Champion and Skinner (2008:48) define it as a belief about the chances of experiencing a risk or getting a condition or disease. For example in this study, a person needs to believe that there is a possibility of getting HIV before he or she will be interested in obtaining HIV testing.

Perceived severity: Perceived severity is a belief about how serious a condition or a disease and its sequelae are (Champion & Skinner 2008:48; Rosenstock 1966:6). In other words, it includes evaluation of consequences on medical (e.g. death, disability and pain) and social (e.g. effect of the condition or disease on social life, family life and work) (Janz & Becker 1984:2). For example in the context of this study, individuals need to believe that HIV/AIDS is a serious disease that has impacts on medical or social life so that they will engage on HIV testing behaviour.

Perceived benefits: Perceived benefits refer to one's belief in efficacy of the advised action to reduce risk or seriousness of impact. It is in general the benefits of engaging in the protective or impact mitigation behaviour (Redding, Rossi, Rossi, Velicer & Prochaska 2000:182; Champion & Skinner 2008:48). For example in the context of this study, an individual need to believe that undergoing HIV testing will reduce risk of contracting HIV/AIDS or reduce medical and social impacts of having HIV/AIDS.

Perceived barriers: These are beliefs about the tangible and psychological costs of the advised action (Champion & Skinner 2008:48). It is also called perceived cost that refers to loses or barriers that interfere with behavioural change (Redding et al 2000:182). For example in the current study, in order for an individual to get tested for HIV, individual needs to belief that there is low cost or barrier of undertaking HIV testing compared to the benefit of undertaking HIV testing.

Cues to action: Cues to action involve a stimulus that motivates or reminds an individual to engage in health behaviour (Redding et al 2000:182). Champion and Skinner (2008:48) define it as strategies to activate "readiness." For example, in

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addition to the different beliefs, individuals need some kind of motivator or reminder that can trigger for receiving HIV testing.

Perceived Self-efficacy: Bandura (1997) defines perceived self-efficacy as the confidence that one can successfully execute the behaviour required to produce the outcomes. Champion and Skinner (2008:48) define it as confidence in one's ability to take action.

Mediating factors: These are variables or factors that are believed to indirectly affect behaviour through influencing individual beliefs. Demographic, structural and social variables are examples of mediating variables (Redding et al 2000:182).

1.7   FOUNDATIONS OF THE STUDY

1.7.1 Meta-theoretical assumptions

Wallis (2010:78) defines meta-theory as "primarily the study of theory, including the development of overarching combinations of theory, as well as the development and application of theorems for analysis that reveal underlying assumptions about theory and theorizing."

Musa (2013:43) underlines that articulating meta-theory helps in scholarly inquiry in providing a way of thinking and explaining the philosophical approach to research which further shapes the action of the researcher in the choice of research design and methods. There are various types of meta-theories based on the different paradigms.

Guba and Lincoln (1994:107) define paradigm as 'a set of basic beliefs (or metaphysics) that deals with ultimates or first principle". Morgan (2007:50-54) explains paradigm as a world view; an epistemological stance; as shared beliefs among a community of researchers and as model examples of research.

There are different ways of classifying paradigms. Tashakkori and Teddlie (1998) suggest four distinct paradigms – positivism, post-positivism, pragmatism and constructivism. Pruyt (2006:9) explains the different paradigms as follows. The positivist ontological-epistemological position is realist-objective – there is a single external reality

which can be known by an objective observer. The position of a constructivist is that multiple socially constructed realities exists and can be accessed by a subjective observer. The post-positivist position states that the enquiry is somehow not value free and can be influenced by the value held by the researcher.

Pragmatists choose methods based on what will work best for the research questions. A researcher can choose qualitative or quantitative or mixed approaches based on the type of research questions that are going to be addressed by the researcher.

Paradigm issues are major concerns in mixed method research and often there is no consensus on what type of paradigm to use in case of mixed methods (Hall [Sa]:5).

In this study; because of the nature of questions being addressed; and because of the importance of having qualitative study as a part of development of the research tool (HTBS) before the dominant quantitative study, the researcher adopts the pragmatist's position.

1.7.2 Theoretical framework

Theory is defined as a set of interrelated concepts (constructs), definitions, propositions that present a systematic view of events or situations by specifying relations among variables in order to explain and predict the events or situations (Glanz, Rimer & Viswanath 2008; Kerlinger 1986). Chafetz (1978) defines theory as a set of relatively abstract and general statements which collectively purport to explain some aspect of the empirical world. It is difficult to explain a certain health behaviour event or situation using one theory as the influencing factors are complex to be explained by a unifying theory. Models are designed in such a way that concepts from various theories are put together to explain or predict a certain health behaviour (Earp & Ennett 1991).

The HBM was used as a conceptual framework to guide the overall conduct of the study. The theory (Figure 1.1) underpinning this study is: If individuals believe that they are susceptible to HIV, believe that HIV/AIDS would have potentially serious consequences, believe that HIV testing would be beneficial either to accessing early HIV/AIDS treatment services or prevent further susceptibility to HIV, believe the anticipated benefit of taking an HIV test would outweigh the barriers to taking an HIV

test, believe in their ability or confidence to successfully take an HIV test and the presence of triggers or cues to take an HIV test, then those individuals are likely to receive HIV testing or intend to take HIV testing. Modifying factors such as socio-demographic variables and comprehensive knowledge about HIV/AIDS will affect individual beliefs related to HIV test seeking behaviour (Glanz et al 2008). HBM is discussed and presented in great detail under Chapter 3 of this thesis.
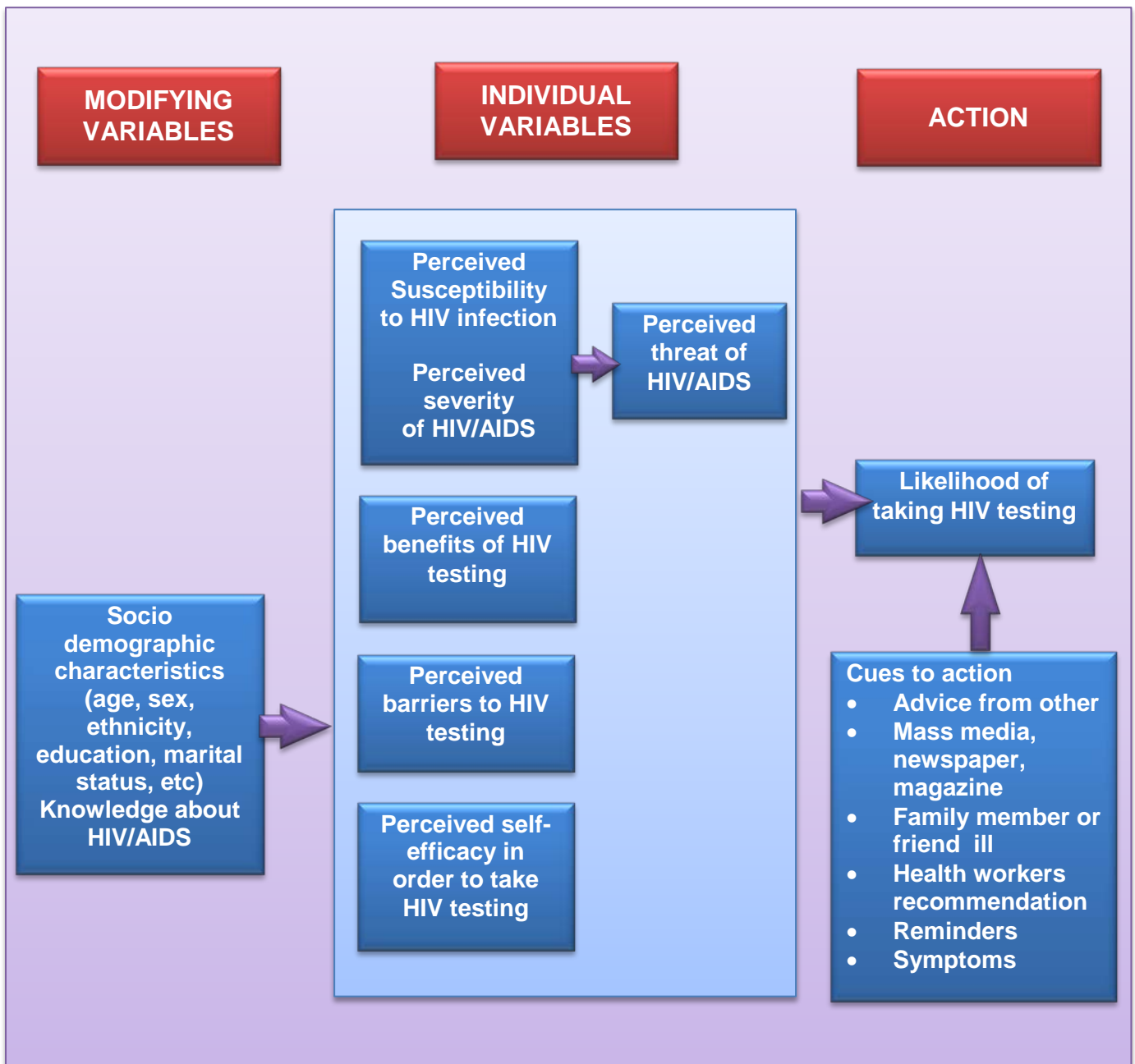
Figure 1.1: Theoretical framework

(Adapted from Glanz & Bishop 2010)

1.8   RESEARCH DESIGN AND METHOD

A mixed (sequential qualitative followed by dominant quantitative) study design was employed in phased approach. Figure 1.2 outlines methods employed at each phases of the study.
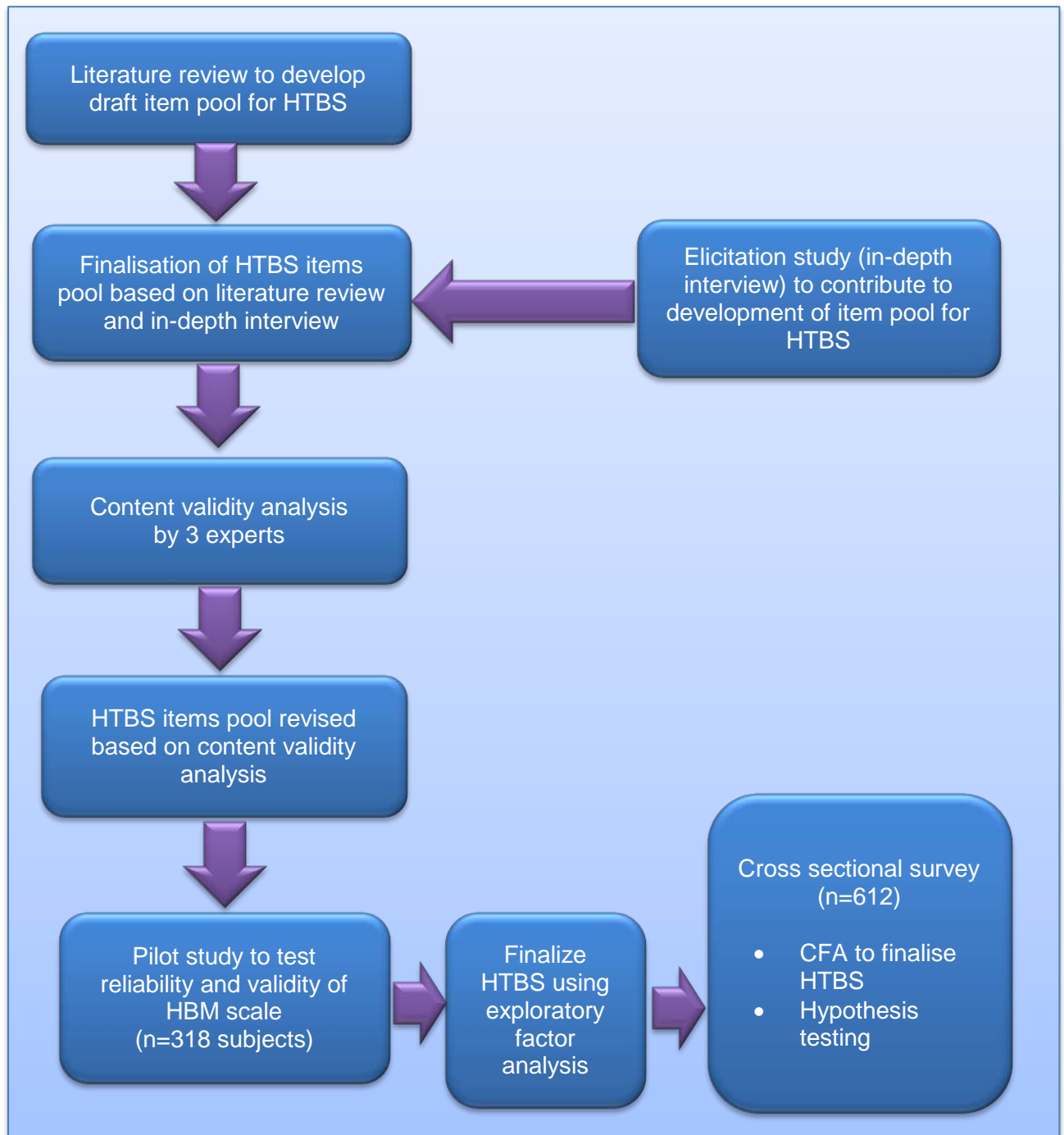
Figure 1.2: Overview of HTBS development and data collection procedures

Three main phases have been undergone to address the main research questions. Detail regarding methods is presented in Chapter 3 of this study report.

Phase I: The first phase was an exploratory qualitative study that employed in-depth interview of university students, the result of which contributed in the development of the research instrument (HTBS) in addition to literature review.

After completion of the qualitative study and literature review for the identification of items for HTBS, content validity assessment of HTBS was done by three experts as part of the scale development processes.

Phase II: The second phase of the study involved quantitative study for the pilot survey that was intended to analyse reliability and validity of HTBS as part of the development processes of the HTBS. The refined HTBS was used in the third phase of the study.

Phase III: The dominant and third phase of the study used a quantitative study (cross-sectional survey) that enrolled randomly selected university students in order to further refine the HTBS through confirmatory factor analysis. Moreover, it has helped in order to analyse factors that predict HIV testing intentions/behaviour among university students.

1.9   SCOPE OF THE STUDY

The scope of the current study is limited to the development of HTBS and answering questions related to application of health belief model in predicting HIV testing behaviour and intentions among university students. This study is limited to university students and may not reflect the realities among other sectors of the population and young peoples who are not in university.

1.10   STRUCTURE OF THE THESIS

This research report has eight chapters. Each of the seven chapters is described as follows:

Chapter 1: This chapter is devoted for explaining the overall orientation to the study. It provides information about background information about research problem, and it presents research problem, aim and specific objectives of the study, significance of the study, conceptual and operational definitions regarding terms and concepts used in the study and provides brief overview of research design and methods. It concludes with scope of the study and structure of the thesis.

Chapter 2: The second chapter deals with literature review. It provides detailed information regarding studies conducted in the area of HIV/AIDS and HIV testing in the context of researches done in Ethiopia, Africa and the globe. It clearly demonstrated the source of research problem and research gaps in the area.

Chapter 3: The third chapter is about research design and methodology. This chapter explains in detail the overall design of the research and specific methods employed in the study. It further discusses sampling, ethical considerations, development and testing of data collection tool, data collection approaches and methods, data analysis and concludes with internal and external validity.

Chapter 4: It deals with analysis, presentation and description of the results from the first phase of the study – qualitative study. It explains data analysis and management, and details information study results presented systematically based on the objectives of the study. It presents findings about key beliefs and cues to action that were identified for the development of items that were included in the HTBS.

Chapter 5: This chapter analyses the results from the second phase of the pilot study that utilised a sample survey for the development of HTBS using EFA. It analyses and finalises the HTBS scale that was used for the third phase of the study.

Chapter 6: The chapter deals with the analysis, presentation and discussion of SEM-CFA analysis in effort to finalise the HTBS using cross-sectional survey data.

Chapter 7: It deals with the analysis, presentation and interpretation of the results from the third phase of the study that utilised cross-sectional survey. It addresses answers for the main research questions and research hypothesis.

Chapter 8: The research is concluded in chapter eight which is the last section of the research report. It provides concise information regarding study conclusions, recommendations and limitations of the study.

1.11 CONCULUSION

The antiretroviral therapy coverage in sub-Saharan Africa is only 37%. In sub-Saharan Africa, only half (51%) of people living with HIV/AIDS know that they are HIV infected. HIV testing uptake in sub-Saharan Africa is not enough to reach people who need HIV care, support and treatment services. This is mainly attributed to lack of awareness of one's HIV status. In Ethiopia, for example, only 21% of young women and 20% of young men aged 15–24 have received an HIV test and know their HIV test results, which is the lowest by any standard. Moreover, studies conducted on analysing HIV testing behaviour using the Health Belief Model (HBM) were not comprehensive and only four out of the six constructs were addressed in most studies. The aim of this study is to explore and analyse HIV testing behaviour and intentions among university students in the context of Health Belief Model (HBM) and develop HIV testing Belief Scale (HTBS) in the Ethiopian context. A mixed (qualitative followed by dominant quantitative) study design was employed in phased approach to answer the main research questions.

In the next chapter, literature will be reviewed and presented aligned with main research problem, research questions and methods.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

In the previous chapter, detailed information has been presented regarding the overall orientation of the study including but not limited to statement of research problem, key research objectives and questions and research methods.

In the current chapter, literature review that focuses on background information on HIV/AIDS and HIV testing, the research topic and methods is presented in greater detail. The purpose of this chapter is to clearly put the research topic in context and further analyse and present the knowledge gaps in a systematic way.

2.2 THE BASICS OF HIV/AIDS

2.2.1 History and epidemiology

Unusual cases of rare clinical conditions such as Kaposi's sarcoma, opportunistic infections (e.g., pneumocystis carinii pneumonia) and unexplained persistent lymphadenopathy among young previously healthy male homosexuals were first observed in 1981 in New York. These individuals had a common immunologic deficit in cell mediated immunity which is called Acquired Immune Deficiency Syndrome (AIDS). It was later learned that this syndrome was also observed in different groups of people other than male homosexuals suggesting that this could be caused by infectious micro-organisms transmitted by intimate contact such as sexual intercourse or contact with the blood of someone infected (Fauci 2006:839).

In 1983, French scientists indicated the relationship between AIDS and a retrovirus. In 1984, group of French and US scientists published a seminar paper that established the virus known as Human Immunodeficiency Virus (HIV) was the cause of AIDS. Extensive research in molecular biology found three structural and six regulatory genes which together encoded 15 viral proteins (Fauci 2006:839).

HIV/AIDS is one of the most difficult public health challenges ever observed on earth. There were approximately 34 million people were living with HIV at the end of 2011. The prevalence of HIV/AIDS among adults aged 15-49 is 0.8% worldwide although there are considerable variations among different regions. Sub-Saharan Africa is the most severely affected region with an adult prevalence of 4.9%. The second most affected regions are the Caribbean, Eastern Europe and central Asia with prevalence of 1.0% (UNAIDS 2012:8).

Worldwide, the number of new HIV infections is slowing down. For example, at the end of 2011, the sharpest decline of new HIV infections was 42% for the Caribbean and 25% for sub-Saharan Africa from the baseline in 2001. However, the number of new infections among adult population increased by more than 35% in the Middle East and North Africa. In the past ten years, many countries' epidemic has dramatically changed due to the aggressive national and global response to HIV/AIDS (UNAIDS 2012:8). In 39 countries, the incidence of HIV infection was reduced by more than 25% from the 2001 to 2011 (UNAIDS 2012:11). Mortality related to HIV/AIDS has showed a declining trend because of the scale up of anti-retroviral therapy (ART) and decline in the new HIV infections from the peak in 1997. The number of people dying from HIV/AIDS fell in sub-Saharan Africa, the Caribbean, Oceania, Latin America, Asia and Western central Europe and North America by 32%, 48%, 41%, 10%, 4% and 1%, respectively. However, mortality increased in Eastern Europe and Central Asia, and the Middle East and North Africa by 21% and 17%, respectively (UNAIDS 2012:12).

2.2.2 Pathogenesis of HIV1

The pathogenesis of HIV/AIDS is extremely complex and multifactorial. The pathogenesis of HIV depends on the effectiveness of the virus to counteract innate, adapted and intrinsic immunity. Despite its modest size and its few genes, HIV uses advantage of cellular pathways while neutralising and hiding from the different components of the immune system (Simon, Ho & Karim 2006).

HIV 1 enters cells and stimulates intracellular signal cascades which, in turn, might facilitate viral replication (Balabanian, Harriague, Decrion, Lagane, Shorte, Baleux, Virelizier, Arenzana-Seisdedos & Chakrabarti 2004; Cicala, Artho, Selig, Dennis, Hosack, Ryk, Spangler, Steenbeke, Khazanie, Gupta, Yang, Daucher, Lempick & Fauci

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2002). There are two envelopes on the HIV 1 envelope; the external glycoprotein (gp 120) and the trans-membrane protein (gp41). At entry, gp120 attaches to the cell membrane by first binding to the CD4+ receptor. Then pore formation will take place through fusion and release the viral core into the cell cytoplasm, leading to reverse transcription of the viral genome into DNA (Coffin, Hughes & Varmus 1997). The viral protein integrase enzyme, in collaboration with host DNA repair enzyme, inserts the viral genome into host's chromosomal DNA. Finally, integrase binding host factor facilitates integration leading to irreversibly transforming the cell into a potential virus producer (Schroder 2002; Mitchell, Beitzel, Schroder, Shinn, Chen, Berry, Ecker & Bushman 2004; Scherdin, Rhodes & Breindl 1990).

HIV 1 infection is mainly characterised by gradual destruction of naive and memory cells, finally leading to AIDS. HIV replication continues throughout the disease despite the absence of symptoms early in the infection.

2.2.3 Transmission

HIV is transmitted through sexual contact and contact with infected blood such as the sharing of needles used for injections and perinatal transmission (Aberg, Gallant, Anderson, Oleske, Libman, Currier, Stone & Kaplan 2004; Grant & De Cock 2001). The relative importance of route of transmission differs from region to region (Grant & De Cock 2001). The major route of HIV transmission is through heterosexual intercourse and accounts for 85% of all HIV1 infections (Simon et al 2006).

2.2.4 Natural history

Infection with HIV causes a spectrum of clinical features starting from sero-conversion to AIDS and death. The World Health Organization (WHO) and the Centres for Disease Control (CDC) in the USA have developed four stages of HIV/AIDS for adult's age 15 years or more based on the presence of clinical signs and symptoms (WHO 2005a; Mindel, Melinda, Flowers 2001). The first stage is called clinical stage I (asymptomatic stage) and is characterised by acute viral syndrome at infection and persistent generalised lymphadenopathy (PGL) thereafter for several months and years. The second stage is called clinical stage II. Clinical stage II is mainly characterised by moderate weight loss of up to 10%, recurrent respiratory tract infections (e.g.,sinusitis,

bronchitis and otitis media), herpes zoster, recurrent oral ulcerations and other dermatologic conditions. Clinical stage III is manifested by severe clinical conditions including but not limited to severe weight loss (>10% of presumed or measured body weight), unexplained chronic diarrhoea for longer than one month, and unexplained persistent fever (intermittent or constant for longer than one month). The last stage is called clinical stage IV and is mainly characterised by very severe clinical conditions including HIV wasting syndrome, pneumocystis pneumonia, extrapulmonary TB, Kaposi's sarcoma, central nervous system (CNS) toxoplasmosis and HIV encephalopathy (WHO 2005a; Mindel et al 2001; Grant & De Cock 2001).

2.2.5 Diagnosis and management of HIV/AIDS

HIV1 is diagnosed based on the detection of specific antibodies, antigens and or both (Simon et al 2006) through rapid HIV testing or a conventional enzyme-linked immune-absorbent assay (ELISA) and confirmed by Western Blot or indirect timmunofluorescence assay (Simon et al 2006; Aberg et al 2004). Rapid HIV testing that detects antibodies produced against HIV can provide HIV test results within 10-20 minutes with a sensitivity and specificity of more than 99% (Pottie, Dahal, Logie & Welch 2012).

Approximately 50-90% of people with acute HIV infection will develop nonspecific symptoms that suggest acute HIV infection. These symptoms include flu-like symptoms such as fever, fatigue, myalgias/arthralgias, rash and headache for two to four weeks. Severe manifestations of acute HIV infection such as meningoencephalitis and myelitis are rare but can be observed in some patients. The acute phase of HIV infection is only identified through demonstration of the p24 antigen or HIV viral RNA, which can be detected as early as 14 to 15 days and 11 to 12 days after infection, respectively. Diagnosing HIV infection through serology tests is possible only after the development of antibodies (Chu & Selwyn 2010). After confirmation of HIV infection, CD4 and viral load tests are performed to determine the stage of the disease for informing patient care and treatment services (Simon et al 2006).

The medical management of established HIV infection starts with taking the medical history including noting the symptoms and signs related to HIV infection, past laboratory tests and treatments. This is followed by physical examinations and laboratory tests that

will inform proper treatment and monitoring (Aberg et al 2004; Clumeck, Pozniak & Raffi 2008).

The goal of HIV care and treatment is to improve clinical status and quality of life along with a CD4 increase/immune restoration and the avoidance of viral resistance through antiretroviral treatment (ART) and management of opportunistic infections and palliative care (Clumeck et al 2008). Criteria to initiate ART in resource-limited countries depend on clinical and immunological assessment. WHO emphasises the use of clinical parameters in deciding to initiate ART along with baseline and subsequent CD4 count. WHO affirms that the absence of CD4 count shouldn't delay initiation of ART if patients are clinically eligible. WHO recommends ART should be initiated if patient is clinical stage III and beyond and CD4 count of less than 350 cells/mm3 (WHO 2006a).

2.3   HIV/AIDS IN ETHIOPIA

In Ethiopia, the first HIV/AIDS cases were reported in 1986. The early stages of the epidemic typically affected high risk groups such as commercial sex workers (CSWs), men in the uniform and long truck drivers ultimately becoming a generalised epidemic. According to a 2012 Federal HIV/AIDS Prevention and Control Office (FHAPCO) report, the epidemic exhibited an initial steady rise in the prevalence of HIV, then reached a plateau and currently seemed to decline (FHAPCO & FMOH 2012).

Ethiopia is one of the sub-Saharan African countries strongly affected by HIV/AIDS. According to the Demographic and Health Survey (DHS) conducted in 2011, the national adult HIV prevalence is 1.5%. The overall prevalence of HIV among young people age 23-24 years is 0.9%. About 800,000 people live with HIV/AIDS and around 1 million children are orphaned by HIV/AIDS in the country. Only 23.9% of women and 34.2% of men age 15-24 correctly identify ways of preventing the sexual transmission of HIV and who reject major misconceptions about HIV transmission. About 10.9% of women and 1.2% of men aged 15-24 years had sexual intercourse before the age of 15 years (Central Statistical Agency [CSA] & ICF International 2011).

According to 2012 FHAPCO report, application of effective and feasible preventive interventions to avert HIV infection, use of highly active anti-retroviral therapy (HAART), and sustained global and national commitment have resulted in successful control of the

epidemic in the country. Although much is achieved in the fight against HIV/AIDS in Ethiopia, FHAPCO report showed that much should be done in order to sustain the gains in this regard (FHAPCO & FMOH 2012).

There are few published studies regarding the magnitude of HIV/AIDS among Ethiopian university students. According to a study conducted among university students in Ethiopia by Dingeta and his colleagues, risky sexual practices such as commercial sexual contact, same sex partners, and lack of condom use are high (Dingeta, Oljira & Asseffa 2012).

2.4   HIV TESTING AND COUNSELING (HTC)

2.4.1 History, purpose and modes of HTC

The first anonymous and voluntary HIV testing (VCT) service was established in 1990 in Kampala, Uganda. Because of the stigma and discrimination at the time, the Ugandan program adopted an alternative testing strategy from United States and was opened in a business building which was free of charge and clients were not asked their names (Marum, Taegtmeyer, Parekh, Mugo, Lembariti, Phiri, Moore & Cheng 2012).

HIV testing and counselling (HTC) is a critical entry point to access HIV care, treatment and support services. The final goal of HTC is not merely to increase access to and uptake of HTC, but to support HIV prevention and provide treatment, care and support to all who need it (WHO 2010, United Nations Population Fund (UNFPA) 2002). Knowledge of one's HIV status benefits individuals, community and the population at large. At the individual level, awareness helps to reduce risk of acquiring and transmitting HIV, facilitates access to care, treatment and support services, and prevents transmission of HIV from mother to child. At the community level, awareness helps reduce denial, stigma and discrimination and thus leads to collective responsibility and action. At the population level, awareness can influence the policy environment, normalise HIV/AIDS and reduce stigma and discrimination (WHO 2005b).

A successful HIV/AIDS program requires a robust HTC services that focuses on maximising coverage and quality of care. To achieve this, identifying acceptable, cost effective and best reach to most vulnerable people HTC modalities is crucial. Facility-

and community-based HTC are the two broad categories of modes of service provision. Facility-based HTC service is the traditional way of providing HTC and can be provided in health care setting integrated with other health services or as a stand-alone voluntary counselling and testing (VCT). Health facilities can provide integrated HTC services in the context of maternal and child health programmes and clinical settings including in inpatient and in outpatient services. The community-based HTC services are developed to maximise program coverage and reach those in need (WHO 2002; WHO 2010; WHO 2012; Menziesa, Abangd, Wanyenzee, Nuwahaf, Mugishag, Coutinhoh, Bunnelli, Mermini & Blandforda 2009). The community-based HTC service is mostly delivered as outreach services for the most vulnerable and may include mobile HIV testing programmes. The various modes of delivering HTC are designed in order to reach different target groups with different objectives (FHI 2005).

2.4.2 HTC procedures

HIV testing and counselling is a process by which individuals or couples are provided with HIV tests and receive their HIV test results in community-based or health facility setting. It involves pre-test counselling about whether to receive HV testing and assessment of individual risks before HIV testing and post-test counselling after the test. Post-test counselling deals with planning on modifying individual's or couples' behaviours to further protect one from acquiring HIV or transmitting it to others and facilitation of referral to appropriate services including HIV care and treatment services. HIV testing procedures should be confidential, accompanied by counselling and should be conducted with informed consent. HTC services could be client initiated in which case clients come to HTC services and request the service or they could be provider-initiated in clinical settings (UNAIDS & WHO 2004; McCauley 2004).

HTC services generally include HIV prevention counselling, pre-test counselling, post-test counselling, on-going counselling for people affected by HIV/AIDS, treatment-adherence counselling, paediatrics counselling and HIV testing procedures (UNICEF 2009).

There are two broad categories of HIV tests: antibody and virological tests. Test such as enzyme-linked immunosorbent assay (ELISA), simple/rapid tests, saliva assays, urine assays, and the Western blot are among antibody tests. Virological tests include HIV

antigen test, polymerase chain reaction test and viral culture. HIV testing and provision of test results should be provided by trained and authorised personnel depending on the policy and guideline of HIV testing (PAHO 2008)

2.4.3 Coverage of HTC

The 2011 UNAIDS report indicated that only 54% of adult and children eligible for anti-retroviral therapy (ART) in sub-Saharan Africa are started on ART. Lack of knowledge of serostatus by people living with HIV is a major obstacle to achieving universal access to treatment and prevention (World Health Organization [WHO], Joint United Nations program on HIV/AIDS [UNAIDS], and United Nations International Children's Fund ([UNICEF] 2011).

The median number of HIV tests per 1,000 adults in the population is 82 for 43 sub-Saharan African countries for which data were reported for 2010 (World Health Organization [WHO]), Joint United Nations Programme on HIV/AIDS [UNAIDS], and United Nations International Children's Fund [UNICEF] 2011). A report from a review of the Demographic Health Survey (DHS) data from nine African countries demonstrated that HIV testing remains low but is highly variable across countries (Glick & Sahn 2007). However, the 2012 UNAIDS report indicated that HIV testing coverage among adult population in 14 sub-Saharan African countries has significantly improved. According to the same report, the HIV testing rate is lower in men than women. Most of the countries for which demographic and health survey data are available, HIV testing coverage is less than 25% (UNAIDS 2012).

2.4.4 HTC in Ethiopia

Since the development of national AIDS policy in 1998, the government of Ethiopia, with the support of aid partners, has made tremendous achievements towards the goal of universal access to HIV prevention, treatment, and care and support services (FMOH & FHAPCO 2010). HIV testing is a critical entry point to access HIV/AIDS services (FHAPCO & FMOH 2007). It is one of the essential components of the national multi-sectorial response against HIV/AIDS. However, only 21% of women and 20% of men aged 15–24 years have received an HIV test and know their results (Central Statistical Agency [CSA] & ICF International 2011).

The availability of effective care and treatment services in the country has progressively created the demand for HTC services. According to the 2007 FMOH HTC guideline, there are three types of HIV testing in the country. The first one is client-initiated or voluntary counselling and testing which deals with providing HIV counselling and testing services for clients seeking HTC services and who appear at voluntary counselling sites on their own initiative. The second type of HIV testing is called provider-initiated testing and counselling service which is recommended by health care workers during clients' visits for other health care services. The third type of HIV testing service deals with providing HTC services under special circumstances and is called mandatory and compulsory HIV testing. This includes HIV tests conducted for individuals or groups when requested by court and mandatory HIV testing of blood donation for transfusions and tissue or organ transplantation (FMOH & FHAPCO 2007).

Several studies have been conducted on HIV testing and counselling in Ethiopia for the past couple of decades. The Ethiopian Health and Demographic Survey is one of the few studies that covers the whole country and answers coverage of HIV testing and other HIV/AIDS related questions. The other studies conducted on HIV testing and counselling are small in scale and are limited to a certain geographic and demographic segments.

According to the recent Health and Demographic Survey conducted in 2011, 82% of men and 66% of women knew where to get HIV screening services. The survey also indicated that people who are never married, have had sex, who are living in the capital city Addis Ababa, who have secondary or higher education and who are in the highest wealth quintile are more likely to know where to get HIV screening services compared to those who are married, had no sexual history, who are living outside of the capital city, who are illiterate or have lower education status and people who are in the lower wealth quintile. The same study revealed that 36% of women and 38% of men have ever been screened for HIV and have received their HIV test result. The study summarises that about 61% of women and 59% of men have never been screened for HIV during their life time. Regarding current HIV testing practices, the study showed that only 21% of women and 20% of men aged 15–24 years have received an HIV test and know their results in the year preceding the survey (Central Statistical Agency [CSA] & ICF International 2011).

There are few studies that are published and accessible regarding matters related to HIV testing in the general population. A study conducted among urban and rural dwellers in north-western Ethiopia revealed that around 73.8% of the participants knew about the availability of voluntary counselling and testing services and urban dwellers are more willing to take HIV testing services than rural dwellers (Alemu, Abseno, Degu, Wondimkun & Amsalu 2004). The other study conducted on tuberculosis patients showed around 70% of these patients have had HIV testing and counselling services and those with formal education demonstrated high awareness about HIV testing, low stigmatising attitudes and are likely to accept HIV testing (Ayenew, Leykun, Colebunders & Deribew 2010). However, a study conducted among health professionals in the south-western part of Ethiopia revealed that only 31% have ever been tested for HIV (Abamecha, Godesso & Girma 2013).

There are limited published studies regarding factors that explain and predict HIV testing behaviours in Ethiopia. However, most of the cross-sectional surveys have attempted to analyse factors that inhibit or facilitate HIV testing behaviour among specific segments of the population. There are only few studies that are based on a health education model in Ethiopia making the area very open for further research. A secondary data analysis of the Ethiopia Health and Demographic Survey conducted in 2005 for the male population revealed that having no stigmatising attitude towards people living with HIV is associated with utilisation of HIV testing services both in rural and urban settings. Being younger men and in a higher socio-economic position are associated with utilisation of HIV testing. Risky sexual behaviour is strongly associated with HIV testing behaviour in the urban setting (Leta, Sandoy, Flykesnes 2012).

There are few studies that have been conducted on HIV testing and counselling among university students in Ethiopia. These studies are retrospective cross-sectional in nature and are not health education theory/model based. A study conducted among Debre-Markos University students in north-western Ethiopia by Addis et al (2013) showed that 86.3% of students had adequate knowledge on voluntary counselling and testing (VCT)and 73.3%of them had positive attitudes towards VCT. The same study also revealed that 61.8% of students have had HIV testing in the past. Another study conducted in another Ethiopian university found that 58.5% have received HIV testing which is closer to the one conducted in Debre-Markos University (Tsegay et al 2013). A

different study conducted among students attending colleges in the state of Harari showed that 52.8% of the students have been tested for HIV (Dirar et al 2013).

Factors such as fear of HIV positive results, stigma and discrimination were reported as the prominent barriers towards performing voluntary HIV testing (Addis et al 2013).

2.5   THE HEALTH BELIEF MODEL

2.5.1 Origin and background

Health education theories are helpful at explaining a given health behaviour in situations such as planning, implementation and evaluations of health education and promotion interventions (National Cancer Institute, National Institute of Health, US Department of Health and Human Services 2005).   Kerlinger (1986) defines theory as a set of interrelated constructs (concepts), definitions, and propositions that present a systematic view of phenomena by specifying relations among variables, with the purpose of explaining and predicting a phenomenon. A theory is made up of interrelated concepts, which are further adopted and developed to constructs. Constructs are further explained by variables which are more operationalised to encompass specific and measurable issues. When more than one theory is used together to describe a given context or situation, then it is called a model (Earp & Ennett 1991).

According to the review done on 497 articles by Glanz et al (2008:31), the eight most frequently cited theories and models commonly include: Health belief model (HBM), social cognitive theory (SCT), self-efficacy (Bandura 1997), the theory of reasoned action (TRA)/theory of planned behaviour (TPB), community organisation, transtheoretical model (TTM)/Stages of Change, social marketing, and social support/social networks.

The HBM is one of the most commonly used conceptual frameworks to explain disease prevention, screening behaviour and adherence to medical care and treatments (Champion & Skinner 2008). As cited by Champion and Skinner (2008) in Hochbaum (1958) and Rosenstock (1960, 1974), the HBM was developed in the 1950s by United States (US) psychologists to explain the failure of people to participate in programmes that were aimed at disease prevention and detection. The model was later used to study

people's response to symptoms as cited in Kirscht (1974) by Champion and Skinner (2008), and behaviours related to adherence to medical treatment cited in Becker (1974).

HBM was formulated based on Cognitive Theory (Lewin 1951; Tolman 1932) which assumes that behaviour is a function of the subjective value of an outcome and of the subjective probability or expectation that a specific behaviour or action will achieve that outcome; hence the HBM is included in the general category of theories called "value expectancy theories". When value expectancy theory was contextualised into health behaviour, it encompassed two important assumptions of individuals regarding their behaviours. The first one is that individuals value avoiding illness and value getting well and the second one is that individuals expect that a given health behaviour or action may prevent or improve an illness situation (Conner 2010; Champion & Skinner 2008).

2.5.2 Constructs of HBM

The National Cancer Institute of the US Department of Health and Human Services defines constructs as concepts developed or adopted for use in a particular theory or model. The key concepts of a given theory or model are its constructs (National Cancer Institute, National Institute of Health, US Department of Health and Human Services 2005).

When applied to health behaviour, the HBM is composed of concepts that will explain or predict why people will or won't take action to prevent, to screen for disease, or receive treatment for disease conditions. These include perceived susceptibility to acquiring a disease, perceived severity of a disease condition, perceived benefits of a certain action/behaviour, perceived barriers to a behaviour or action, cues to action, and, recently added, perceived self-efficacy (Champion & Skinner 2008).

When explained using its six constructs, the HBM assumes that if individuals consider themselves susceptible to a certain disease or health condition, believe that the condition would result in serious consequences, believe that taking a course of action would reduce either their susceptibility to the condition or severity of the condition, believe that the expected benefit of taking action outweighs the barriers to the action, believe in their confidence and ability to take the needed action and if there is a

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reminder or "cue to action" then they are likely to take the action (Champion & Skinner 2008).

2.5.2.1 Perceived susceptibility

Champion and Skinner (2008) define perceived susceptibility as a belief about the likelihood of getting a disease or condition. If people believe that they are susceptible to a particular health condition and its outcomes then they are motivated to implement a healthy behaviour (Rosenstock 1966). Individuals vary in their feelings of vulnerability to various health conditions and perceived susceptibility therefore refers to one's subjective perception of the risk of contracting a condition. Hochbaum (1958) initially found that among individuals who both believe that they are susceptible to tuberculosis and that they will benefit from early detection, 82% had at least one voluntary x-ray compared to 21% of those exhibiting neither of the two beliefs. However, only a few studies on health behaviour focusing on prevention and adherence to treatment were able to demonstrate that perceived susceptibility predicts or explains health actions or behaviour towards alleviating or ameliorating a disease or health condition. A study conducted on sexual communication among African immigrants in the US by Asare and Sharma (2012) revealed that perceived susceptibility has a positive correlation with the participants' condom use and sexual communication behaviours. According to a review done by Janz and Becker (1984), perceived susceptibility was a better predictor of behaviour in cases of prevention behaviour than treatment. Similarly, a meta-analysis done by Harrison, Mullen and Green (1992) showed that perceived susceptibility is correlated with behaviour.

2.5.2.2 Perceived severity

Perception of susceptibility to a certain health condition alone does not make an individual to act on a healthy behaviour. Individuals also consider the seriousness of a health condition, in addition to other factors, in order to be motivated to practice healthy behaviour. Perceived severity is generally defined as a feeling or a perception of the seriousness of contracting a disease because of its medical (e.g., death, pain and/or disability) and social effects such as effects on work, family and/or social life. The combination of perceived susceptibility and severity is also known as perceived threat (Champion & Skinner 2008).

2.5.2.3   Perceived benefit

The likelihood of perceived threat (susceptibility and severity) in predicting or explaining a healthy behaviour depends on individual beliefs regarding perceived benefit of the various available actions for reducing or avoiding the health threat. In other words, an individual compares the threat posed by a certain health condition with the benefit of taking a certain action would ameliorate or avoid the health threat. Perceived benefit of adapting new healthy behaviour or continuing already established behaviour includes health and non-health benefits such as healing of a health problem, partial improvement of health condition, financial benefit and psychosocial benefits among others (Champion & Skinner 2008). A meta-analysis of longitudinal studies done on HBM done by Carpenter (2010:666) indicated that perceived benefit was a consistent predictor of performing a given behaviour.

2.5.2.4   Perceived barriers

There are always negative aspects of practicing certain behaviour which are called perceived barriers. A kind of unconscious cost-benefit analysis occurs wherein individuals weigh the action's expected benefits with perceived barriers. Barriers such as cost, unwanted side effects, time, social and/or family related obstacles can be considered as barriers that hinder practicing a healthy behaviour (Champion & Skinner 2008). A meta-analysis by Carpenter (2010:666) indicated that perceived barrier predicted the likelihood of performing in given behaviour.

2.5.2.5   Cues to action

Hochbaum (1958) indicated that perceived susceptibility and benefit could only be potentiated by other factors, specifically cues to initiate actions, such as bodily events or by environmental events such as media publicity although he couldn't demonstrate the relationships in a study. Most recent studies did not also include cues to action as part of the HBM.

2.5.2.6 *Perceived self-efficacy*

Bandura (1997) defines self-efficacy as the conviction that one is able to successfully execute the behaviour required to produce the outcome. Rosenstock, Stretcher and Becker (1988) suggested the addition of self-efficacy to the HBM as a separate construct from perceived susceptibility, severity, benefits and barriers.

2.5.3 Other variables

Many other factors such as demographic, psychosocial and structural variables may influence beliefs and perceptions which indirectly influence behaviour (Champion & Skinner 2008). These variables are also called mediating factors (Redding et al 2000:182).

2.6 APPLICATIONS OF HEALTH BELIEF MODEL (HBM)

2.6.1 The role of health belief model to predict and explain HIV/AIDS related behaviours

HIV/AIDS programmes require early HIV test-seeking behaviour as a means of HIV/ADS prevention, treatment, care and support services. The role of health education behavioural models and theories is critical to understanding behavioural factors that facilitate or hinder healthy behaviours and design behavioural change interventions (Glanz et al 2008; Glanz & Bishop 2010). According to a review by Glanz et al (2008) of 526 articles from 24 journals, the HBM is among the first eight frequently cited models. Since the early 1950s, the HBM has been one of the most widely used conceptual frameworks in health behaviour research. Over the past two decades, the HBM has been expanded, compared to other frameworks, and used to support interventions to change health behaviour.

When translated into the context of HBM, HIV testing behaviour and intentions are affected by individual beliefs: Perceived susceptibility to HIV, the consequences of HIV/AIDS (perceived severity), the benefits of early HIV testing when compared against perceived barriers (perceived benefit and barriers) and the confidence in one's ability to undergo HIV testing (self-efficacy). In addition to the beliefs, the HBM also states that a

specific stimulus is necessary to trigger the decision-making process and this stimulus is termed as a "cue to action". The HBM suggests that for individuals who have high risk sexual behaviour with regard to HIV/AIDS, perceived susceptibility is a requirement before committing to change risky sexual behaviour. For individuals who don't perceive that they are at risk of contracting HIV/AIDS, the benefits or barriers to an action are irrelevant (Glanz et al 2008).

Most of the studies conducted on the role of HBM in explaining and predicting behaviour usually focus on only four components of HMB namely perceived severity, susceptibility, benefit and barriers.

A meta-analysis done by Janz and Becker (1984) on 29 investigations done during 1974-84 revealed that the strongest links were related to the 'barriers' dimension (91%), followed by (in decreasing order), benefit (81%), susceptibility (77%) and severity (59%) based on significant ratios created by dividing the number of positive and statistically significant findings for an HBM dimension by total number of studies. This ordering worked for both prospective and retrospective studies in their study. According to the same review, barriers were significantly associated with preventive health behaviours while severity showing weak or poor association. However, in sick role behaviours, perceived severity was significantly associated, second only to perceived barriers.

Studies conducted prior to 1974, however, demonstrated a different significance ratio with perceived susceptibility the highest (91%) and followed by perceived barriers (80%), perceived severity (80%) and perceived benefit (73%). However, most of these studies focused on preventive health behaviour which mostly favours perceived susceptibility. Moreover perceived barriers were included in only some of the studies (Becker, Hafner, Kasl, Kirscht, Maiman & Rosenstock 1977).

Several studies of various health behaviours have used the HBM as their theoretical basis in order to predict and explain preventive, screening, sick role and service utilisation behaviours in the past several years. One or more of the HBM elements have been used implicitly or explicitly to explain various behaviours related to HIV/AIDS such as condom use, safe sexual practices, and HIV testing. The ability of each of the components of the HBM, when acted upon independently and together, varies from study to study.

2.6.2 Perceived susceptibility

The ability of perceived susceptibility to predict safe sexual intentions/practices and HIV testing intentions/practices varies from study to study. The differences may be attributed to measurement discrepancies among studies (Glanz et al 2008). Perceived susceptibility was positively correlated with safe sexual practices and changing behaviour in studies by Stiles and Kaplan (2004); and Lin, Simoni and Zemon (2005). However, contrary to the HBM, perceived susceptibility was either not associated or negatively associated with safe sexual practices and intentions in other studies (Lux & Petosa 1994; Hounton, Carabin & Henderson 2005; Iriyama, Nakahara, Jimba, Ichikawa & Wakai 2007).

Perceived susceptibility predicting HIV testing intentions or practices is congruent with the theoretical assumptions of the HBM in a relatively larger number of studies (Stiles & Kaplan 2004; Babalola 2007; Omer & Haidar 2010; Kakoko, Astrom, Lugeo & Lie 2006; Paoli, Manogni & Klepp 2004; Kabiru, Beguy, Crichton & Zulu 2011). However, a few studies demonstrated that perceived susceptibility was not associated with HIV testing intentions or practices (Lauby, Bond, Eroglu & Batson 2006; Zak-Place & Stern 2004).

2.6.3 Perceived severity

Findings regarding perceived severity in terms of predicting safe sexual intentions or practices showed lack of association in contrast to the assumptions in the HBM (Hounton et al 2005; Lux & Petosa 1994). However, one study with similar findings (Hounton et al 2005; Lux & Petosa 1994) reported that students with high levels of perceived severity agreed with the intention of abstinence.

2.6.4 Perceived benefit

A correlation of perceived benefits of safe sexual behaviour and voluntary HIV testing is inconsistently demonstrated in various studies. Perceived benefit is significantly associated with safer sex practices such as condom use, limiting sexual partners and voluntary HIV testing (Lazare, Loose, Alou, Colebunders & Nostlinger 2009; Demissie, Deribew & Abera 2009; Lin et al 2005; Laraque, McLean, Brown-Peterside, Ashton &

Diamond 1997). However, a study using the HBM to predict safe sex intentions of incarcerated youth showed that perceived benefit is not associated with safe sex intentions (Lux & Petosa 1994).

2.6.5 Perceived barriers

Barriers to HIV voluntary testing include personal factors such as age and gender, structural factors (distance, cost, waiting time, confidentiality) and social factors such as fear of stigma (Awad, Sagrestano & Kittleson 2004; Lazare et al 2009; Delissaint & McKyer 2008; Kaai, Bullock, Burchell & Major 2011). Various studies demonstrated that perceived barriers are inversely associated with condom use, safe sex behaviour and HIV testing (Hounton et al 2005; Awad et al 2004; Babalola 2007; Lin et al 2005; Paoli et al 2004).

2.6.6 Perceived self-efficacy

Studies conducted on safe sexual behaviours such as condom use and decreasing the number of sexual partners indicated that perceived self-efficacy is a strong predictor of practicing safer sex behaviours (Lin et al 2005; Zak-Place & Stern 2004). Likewise, one study demonstrated that self-efficacy is associated with HIV testing behaviour (Berendes & Rimal 2011).

2.6.7 Cues to action

A review of factors that affect HIV testing and counseling services among heterosexuals in Canada and the United Kingdom showed that illness and having HIV symptoms, HIV education, having a family member or child ill with HIV, wanting to start new sexual relationships, blood donations, recommendation by partner or family for HIV testing, knowing someone who died of HIV/AIDS, receiving a doctor's recommendation for HIV testing and same day test result triggered HIV testing and can be considered as cues to HIV testing (Kaai et al 2011). There are few published studies regarding association of cues to action with safe sexual behaviour or HIV testing. One study demonstrated that cues to action are associated with safe sexual intentions among incarcerated youth (Lux & Petosa 1994).

2.7   CONCULUSION

Globally, several studies have been done to understand factors that are affecting HIV testing behaviour using several types of health behaviour theories and models. HBM is one of such models that have been frequently used to investigate factors that explain HIV testing behaviour. HBM has six components under its theoretical basic structures. Perceived susceptibility, perceived severity, perceived benefit and perceived barrier are the most commonly studied constructs for the last decades. Perceived self- efficacy and cues to action are less researched constructs of HBM. There are very few studies that included all the six constructs of HBM particularly most of the studies exclude cues to action in their conceptual framework.

In Ethiopia, there are few health behaviour theory/model-based studies conducted with the aim of understanding behavioural factors that are related to HIV testing. Omer and Haidar (2010) used a theory of planned behaviour to predict intended use of HIV voluntary counselling and testing services by teachers in the Harari region. A qualitative survey done in 2005, as part of the Behavioural Surveillance Survey (BSS), indicated that that the population still lacks confidence in having an HIV test and counselling. Fear of being HIV positive and the associated stigma and discrimination were the main reasons mentioned by most participants for the slow progress in participation in HIV counselling and testing (Central Statistical Agency (CSA) [Ethiopia] & ORC Macro 2006).

HIV/AIDS programmes require early HIV test-seeking behaviour as a means of accessing HIV/ADS prevention, treatment, care and support services. However, only 20% of people between ages 15-24 years are currently accessing HIV counselling and testing. A few studies conducted in Ethiopian universities also indicated that only half of university students have received HIV counselling.   Promoting HIV testing and counselling are indicated as important components of the national behavioural change and communication framework targeting multilevel factors affecting healthy behavioural practices (Federal HIV/AIDS Prevention and Control Office (FHAPCO) 2011).

CHAPTER 2

RESEARCH DESIGN AND METHODS

3.1   INTRODUCTION

The purpose of this chapter is to clearly describe and explain the different methods used to address the research objectives and research questions/hypotheses mentioned in Chapter 1.

The research design and methods of the study were guided by the research objectives, research questions and research hypotheses, which in turn were crafted based on central research problem. In this study, there were two types of research questions each of which was addressed by qualitative and quantitative research methods, following the mixed methods approach.

3.2   RESEARCH DESIGN

There are two basic and fundamental types of research approaches: quantitative and qualitative. When these two are used in one study, this is referred to as the mixed method approach (Creswell 2005; Gay, Miles & Airasian 2006; Paton 2009). Mixed method research may be considered as the third approach (Creswell 2009); however, Cottrell and McKenzie (2011) explains that it is a hybrid of quantitative and qualitative approaches and underlines Creswell's (2009) view of the fact that qualitative and quantitative designs shouldn't be viewed as opposite poles, rather should be viewed as two ends on a continuum, with a mixed method in the middle.

Mixed method research was started to be used around 2000 (Lund 2012; Caruth 2013). In the last two decades, mixed method has become popular and is emerging as a third research approaches whose in health research is wide spread. It combines the theoretical and technical aspect of both qualitative and quantitative (Ozawa & Pongpirul 2014; Tarik & Woodman 2010; Hossain 2012). There are many definitions of mixed methods approach and there is no one agreed upon standard definition. For the purpose of this study, mixed methods is defined as an approach that utilises rigorous

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quantitative research that assess magnitude and frequency of constructs and rigorous qualitative approach that explores the meaning of and understanding of constructs (Johnson, Onwuegbuzie & Turner 2007; Cameron 2009:143). A mixed method is based on the diverse philosophical perspectives that touch post positivists, social constructivists, pragmatic and transformative perspectives (Greene 2007).

Qualitative study is a systematic and rigorous form of enquiry that uses methods of data collection such as in-depth interview, focus group discussion, observation and review of documents. However, quantitative study is a research approach that is used to test theories, collect descriptive information, analyse relationship between variables which is analysed using statistical methods. Therefore, mixed method involves collection of both qualitative and quantitative data and the combination of the strength of each to answer research questions (National Institute of Health (NIH), Office of Behavioural and Social Sciences Research (OBSSR) 2010).

A mixed methods approach is conducted for the following reasons (Greene Caracelli & Graham 1989; Chaumba 2013; Venkatesh, Brown & Bala 2013; Cameron 2009:144):

- Complementarity: This is use of data obtained through one method to enrich, elaborate and clarifications of data obtained from another method.
- Development: This involves use of results from one method to develop or inform the use of other method.
- Initiation: It involves the use of different methods of the same phenomenon with the purpose of identifying contradictions or generate new insights.
- Expansion: Here, different methods are used to address different questions.
- Triangulation: This involves use of different methods to answer the same questions.

The purpose of using mixed method in the current study was in the sense of 'development' to use results from the qualitative method (in-depth interview) to develop or inform the consecutive methods (pilot study and cross-sectional survey).

Depending on whether qualitative and quantitative methods are implemented sequentially or concurrently, there are two broad categories of mixed method approaches: sequential and concurrent (parallel) mixed method approaches (Cameron

2009:144 and National Institute of Health (NIH), Office of Behavioural and Social Sciences Research (OBSSR) 2010:8). Further sub-classifications under these two broad categories can be drawn based on the level of the emphasis given to qualitative and quantitative (equal or unequal) (Ponterotto 2005:227); the process used to analyse and integrate data; and whether or not the theoretical basis underlying the study methodology is to bring about social change or advocacy. Sequential mixed method approach can have three sub approaches: sequential exploratory, sequential explanatory and sequential transformative. Sequential exploratory mixed method approach utilises qualitative study in its first phase and informs the development of the quantitative method in the next phase of the study (Fetters, Curry & Creswell 2013:2136; Larkin, Begley, & Devane 2014:10). Depending on the emphasis given to quantitative and qualitative approach, sequential exploratory mixed method approach can be subdivided into three categories:

1.   Qualitative component is dominant (QUAL>quan)
2.   Quantitative is dominant (qual> QUAN)
3.   Both quantitative and qualitative component are equally important (QUAL> QUAN)

Note that the arrow indicates sequencing of the methods and the capital and small letters shows which method is dominant over the other respectively (Teddlie & Tashakkori 2006; Creswell et al 2003; Castro, Kellison, Boyd & Kopak 2010; Sandelowski, Voils & Barroso 2006; De Lisle 2011; Ponterotto 2005:227).

In this study, a mixed (qual > QUAN: qualitative followed by quantitative) study design was employed in a sequential approach. In other words, sequential exploratory mixed method approach with quantitative being a dominant component was used in current study.

3.3   RESEARCH METHOD

The exploratory mixed method approach was used in three phases. The first phase was an exploratory qualitative study that employed in-depth interview of university students; the result of which was used in the development of the research instrument for the quantitative study, which was referred hereafter as HIV Testing Belief Scale (HTBS).

The second phase was a pilot study that was intended to refine HTBS using exploratory factor analysis (EFA) and prepare it for the main study.

The dominant and third phase of the study used a quantitative (cross-sectional survey) that enrolled randomly selected university students in order refine the HTBS using structural equation modeling (SEM) – Confirmatory Factor Analysis (CFA). Moreover, data from this phase was utilised to address objectives related to analysing HIV testing intentions and behaviour among university students.

There were four main reasons for using mixed methods, which mainly are related to the main research objectives. The main objective of using mixed methods approach was to develop HTBS which was informed by qualitative study and literature review. And the second reason was that pilot survey was used to further do reliability and EFA analysis of the HTBS. The third reason was that a cross-sectional survey was used to do confirmatory factor analysis and finalise HTBS. The last reason was to analyse HIV testing intention and behaviour using data collected from the cross-sectional survey.

3.3.1 Phase I: Exploratory qualitative study (In-depth interview)

In-depth interview was the method that was employed at the first stage of the study, and addressed objective 1 and further contributed for the development of the HTBS.

Denzin and Lincoln (2000) define qualitative research as a situated activity that locates the observer in the world and consists of interpretive and material practices that make the world visible. It turns the world into a series of representations using interviews, photographs, field notes and narratives. Strauss and Corbin (1998) define qualitative research as any type of research that produces findings not arrived at by statistical procedures or quantifications.

3.3.1.1 *Aim and questions addressed in the qualitative study*

The aim of the qualitative aspect of the study was to explore all the elements of HBM in the context of HIV testing intentions and HIV testing behaviour which has informed the development of HTBS for the quantitative phases of the study. In-depth interview of

students was employed to explore students' beliefs and experiences related to HIV testing in the context of health belief model components. This has helped the researcher to identify beliefs and experiences that in turn have been used in the development of items for the HTBS.

The following are the sub-questions asked:

- What are the common beliefs regarding perceived severity, susceptibility, benefit, barrier and efficacy related to HIV testing in the university students' context?
- What are the common cues to action/triggers that enable people to get HIV testing?

3.3.1.2 Sampling

3.3.1.2.1 Population

In Ethiopia, according to FMOE statistics, there were thirty one public universities in 2014 offering undergraduate and postgraduate programmes under various disciplines (FMOE 2015). All the universities were receiving students from all over the country, offering a diversified community for the study. The population for this study included only undergraduate students who were pursuing studies in different departments during the study period.

Addis Ababa University (AAU) was one of the thirty one universities that enrolled students in the regular undergraduate programmes. AAU was purposively selected for the conduct of the in-depth interview.

3.3.1.2.2 Sampling

The use of appropriate sampling procedure for qualitative research is as important as sampling strategy for quantitative research. There are two broad categories of sampling strategy: random and non-random sampling. Qualitative study uses non-random type of sampling procedure with main focus of obtaining depth as opposed to breadth of information on available and accessible subjects. There following are the different types of sampling procedures in qualitative study: convenience sampling, purposive sampling,

snowball sampling and quota sampling. Convenience sampling allows researcher to select easily available study groups without wasting resources and time. Purposive sampling is used to intentionally select a specific group of study subjects depending on the research questions to be addressed (Luborsky & Rubinstein 1995; McDermott & Sarvela 1999; Sandelwoski 1995; Polkinghorne 2005:139).

The in-depth interview was conducted in AAU. The investigator approached the university through official letter written from UNISA and ethical letter secured from Ethiopian Ministry of science and technology ethics committee. The university academic vice president permitted the conduct of the study and letter was written to two departments. The investigator approached two departments in the university namely biology and accounting which were selected conveniently. The investigator explained the purpose of the study and procedures such as confidentiality and other ethical issues to the participants and invited them to participate in the study. Two student representatives from the two departments registered students who volunteered for the study to facilitate time and place for interview. A list of students with their phone number, convenient time and place for the interview was compiled and interviews were done according to their list and preferred schedule and places. Purposive sampling of female and male students was employed based on gender and recent history of HIV testing. Two categories of students were considered for the in-depth interview; for example, from a group of students who have never tested for HIV and a group of students who have been tested for HIV in the past. Interview started with one student from each group of students.

According to Luborsky and Rubinstein (1995); qualitative study uses non-random or non-probability sampling procedure, e.g. convenience, purposive, or snowball sampling. Non-probability sampling offers the opportunity to investigate people who are available and accessible for the study (Sandelowski 1995; McDermott & Sarvela 1999). In qualitative study, there is no computation of sample size unlike quantitative study. According to Sandelowski (1995), sample size for qualitative study depends on judgement and experience. For this study, the sample size was decided based upon the fact that saturation level was achieved in terms of when new themes and issues were no more arising in the consequent interviews. The procedure is also called 'sufficient redundancy' (Krueger & Casey 2008). In this study, interview was conducted until

saturation level was reached. Twenty six individuals were interviewed for and the interview was interrupted when no new issues were emerging during the interview.

3.3.1.3 Data collection

3.3.1.3.1 Data collection approach and methods

Data for the qualitative component of the study were collected using individual in-depth interview of students. A Digital audio recorder was used to capture the whole interview of each of the 26 participants. The investigator also took notes on relevant issues as the interview proceeded.

Seidman (1998) defines in-depth interview as a qualitative data collection method that enables to understand and explore one's experience and the meaning one makes of that experience. In-depth interview is used to uncover feelings and beliefs an individual has regarding a specific experience. Open ended questions are asked on issues ranging from specific to general topic of interest. In-depth interviews can be used to explore in complex topics; when subjects are knowledgeable about the issue and when an understanding of individual experience is needed (Cottrell & McKenzie 2011). As explained by Kvale (1996), knowledge is created as a result of the interaction between interviewer and interviewee.

In this study, in-depth interview was preferred over focus group discussions. This was because the subject under investigation was concerned with issues that touch beliefs and associated factors as it relates to HIV/AIDS and HIV counseling and testing. And as a result, it would have been difficult to talk such privet issues in a focus group and the possibility of peer influence in a focus group discussion could have affected the result of the interview. Moreover, in-depth interview has provided the opportunity to go further depth and detail in the area of interest, which would have been difficult in a focus group discussion (Cottrell & McKenzie 2011).

However, the inherent limitations of in-depth interview such as the skill of interviewer and interviewee and interviewer fatigue did not have much impact as the principal investigator of the study conducted the whole interviews.

3.3.1.3.2 Development of questions and interview guides

A semi structured in-depth interview guide was prepared based on the six constructs of the health belief model (perceived severity, susceptibility, benefit, barrier and self-efficacy and cues to action). General questions on general knowledge about HIV were also included as starting questions for the interview. As it can be seen in Annex A, open-ended questions with some probing questions were listed under each constructs. Otherwise, the interview was conducted freely even though general and probing questions were listed under the themes. The interview guide was finalised in English and finally interpreted back into Amharic (local language) (Annex B). The guide was revised as the interview proceeds because some questions were changed based on interviewees' response to the questions.

3.3.1.3.3 Interviewing and recording of voices

The interview was conducted by the principal investigator. Interviewees who were identified in advance were contacted in privet places in the campus. Interviewees were given a consent form that describes purpose of the study, procedures and processes of the interview, potential risks and benefits, confidentiality and rights of interviewee including participation and withdrawal. The interviewer explained the consent form to the interviewees; and interviewees finally showed their consent by signing on the consent form. Annex C provides detailed information about the consent form. A Digital tape-recorder was used to capture the interview. The interview guide was used to guide the overall conduct of the interview. In order to avoid language barrier for the interview, the interview was conducted in the local language − Amharic. Although an interview guide was used, the interviewer normally went beyond questions listed in the guide based on the type of interviewee, discussion and the urge to extract more from the participants.

Interviews were conducted in quiet places on campus. Empty classrooms and offices were utilised depending on the choices and interest of interviewees. Interviewees were registered on a registration form that documented individual characteristics such as codes, names, age, gender, department and time interview started and ended; whether interviewees were tested or not tested for HIV. Interviews were recorded using a digital

voice recorder. Recorded interviews were immediately copied to a computer with password protected. The file was also copied to external hard disk as a backup.

3.3.1.4   Ethical considerations for the in-depth interview

3.3.1.4.1   Protecting the rights of the study participants

The study participants were given the full autonomy to decide on whether to participate or not to participate on the in-depth interview. Participation on the in-depth interview was entirely based on volunteerism. As explained in the previous section, informed consent explaining objective of the study, procedures, potential risk and discomforts, confidentiality and other issues was provided to interviewees before the start of the interview. The interviewees were given enough time to read through the consent form and were asked to sign on the form if they could volunteer to participate in the in-depth interview.

It was explained to the interviewees that there was no direct benefit to be gained by the interviewees from attending in the in-depth interview. However, it was explained to them that the results of this study could contribute to the knowledge regarding HIV testing behaviour in university students and help in designing HIV testing programmes in university settings in Ethiopia.

There was no significant risk or discomfort related to participating in the in-depth interview except minor discomfort attached to answering personal and sensitive questions. Interviewees were advised to contact the investigator of the study for a referral to receive psychological and social support, had they experienced any discomfort.

Interview records and transcripts were stored in a computer which is password protected and won't be disclosed to other people who are not engaged in the study. The interview records and transcripts may be deleted permanently after five years from the completion of the write up of the study.

3.3.1.4.2 Protecting the rights of the institution

Ethical clearance was obtained first from Health Studies Higher Degree Committee of UNISA (Annex D). Letter written from UNISA-Addis Ababa Regional Office (Annex E) contacted Ministry of Science and Technology (MOST). Finally, ethical clearance was secured locally in Ethiopia from National Research Ethics Review Committee of MOST (Annex H). Letters written from UNINSA - Addis Ababa Regional Office (Annex F) and Ministry of Science and Technology (Annex H) were presented to Addis Ababa University where the study was conducted. The university official approved the conduct of the study and contacted respective departments and colleges for further facilitation of data collection (Annex J).

3.3.1.4.3 Scientific integrity of the researcher

The investigator of the current study holds Masters of Public Health and had successfully completed PhD proposal modules at UNISA and hence was able to conduct this study as per the standard set by UNISA. The investigator of the study had followed objectively verifiable procedures and rules that govern the conduct of scientific enquiry. Interview findings can be re-checked and verified through reading transcripts and hearing interview records. The investigator had no conflict of interest with the topic under investigation.

3.3.2 Phase II: Development and testing of the HIV testing Belief Scale (HTBS)

The development of HTBS addresses 'objective 1' of the study.

Development of a scale involved step by step procedures and processes (Williams, Brown & Onsman 2010; Barry, Chaney, Stellefson & Chaney 2011). According to DeVellis (2003), there are three main steps in developing a scale. The first step is to clearly define what is going to be measured. The second step is to generate an item pool and finally followed by determining format for measurement. In relevant to this study, Zagumny & Brady(1998:174) followed two phases in order to develop AIDS Health Belief Scale(AHBS). The first phase was item development and item analysis which was followed by reliability and factor analysis of the scale.

Relevant theories in the field help a lot in developing new scale. If theories are not sufficient or relevant in designing the scale then the investigator may decide laying out conceptual frameworks that aid the development of the scale.

In health behaviour theories or models, each theory or model is represented by a set of concepts. Gibbs (1972) describes these associations among proposed constructs of a theory or a model as relational statements. This association is mostly shown by arrows to connect related concepts. The arrows show how the different variables are affecting each other and the outcome of interest. For example, as shown in Figure1.1, HBM is represented by six constructs: perceived susceptibility to HIV/AIDS, severity of HIV/AIDS as a disease, benefit of HIV counseling and testing, barrier towards HIV counseling and testing, self-efficacy to have HIV counseling and testing and cues to action; and each of which works together to determine or explain HIV counseling and testing intention and behaviour or practices. Each of these constructs is considered as a variable for the study and corresponding operational definitions is given in detail in the below section.

3.3.2.1 Theoretical definitions

The first step in the development of a scale is to clearly define what is going to be measured in the context of the proposed theory or model.

A theoretical definition is defined as the meaning of the concept or construct as given by substituting other words or phrases for it and this is usually taken from the theoretician who first defined the terms. DeVellis (2003) puts the relationship between theory and measurement as follows:

"The phenomenon we try to measure in social science research often derive from theory. Consequently, theory plays a key role in how we conceptualise our measurement problems. Of course many areas of science measure things derived from theory".

Health belief model (HBM) was used as a theoretical framework to guide the conduct of this study.

Champion and Skinner (2008:48) define the constructs of the HBM as follows:

- Perceived susceptibility: Belief about the chances of experiencing a risk or getting a condition or disease.
- Perceived severity: Belief about how serious a condition and its sequelae are.
- Perceived benefits: Belief in efficacy of the advised action to reduce risk or seriousness of impact.
- Perceived barriers: Belief about the tangible and psychological costs of the advised action.
- Cues to action: Strategies to activate "readiness."
- Self-efficacy: Confidence in one's ability to take action.

3.3.2.2 Measurement

Kerlinger (1986) defines measurement as the process of assigning numbers or levels to objects, events, or people according to a particular set of rules. The focus of measurement in research is variables. Cottrell and McKenzie (2011) define variables as a characteristic or attribute of an individual or an organisation that can be measured or observed by the researcher and varies among individuals or organisations studied.

In health behaviour and education research, measurement of variables is a key issue to achieve the objective of a study. Measurement helps convert variables into empirical indicators − the actual instruments used to measure concepts or constructs (Di Iorio 2005). Di Iorio (2005) puts the procedures to develop a measurement instrument as: begins understanding of the concept to be measured; writing items; stating the rules for using the scale; devising scoring methods and finally assigning a numeric score corresponding to the type of conceptual dimension or the amount (quantity) of the variable.

3.3.2.3 Generating items pool

Once the purpose of the measurement is clarified, then construction of the instrument should proceed. The first step is to generate a large pool of items that are eligible for the final inclusion in the scale. For this study, the pool of items was built based on literature

review from various studies conducted on health belief model in the context of HIV testing and HIV/AIDS in general under each constructs of HBM and HIV testing intention. Moreover elicitation study to further explore beliefs and cues to action in the context of HIV testing was conducted using an in-depth interview of 26 students that also contributed items for the pool.

At the initial stage of scale development, Di Iorio (2005) and DeVellis (2003) recommends to include as many items as possible so that during the process of reliability and validity assessment fair number of items will survive at the end. There is no standard rules as to how many number of items should be included under a construct. There are limitations to each of the choices. For example, increasing number of items will improve internal consistency, but Hinkin (1998) argues that increasing the number of items may result in bias due to fatigue or boredom of respondents. In this study, a total of 61 items were included in the initial item pool as indicated below in Table 3.1. As defined in the next sections, 58 items were representing the six constructs of HBM and the rest three were representing HIV testing intention.

After item pool was created, the next important step in scale development was to decide on the formatting of the items that should be presented to respondents. Scaling or formatting is a method by which researchers assign response categories with a corresponding values or numbers to it. There are several forms of scaling an item. The use of various scales depends on the type of respondents and items, theoretical or model chosen. Likert scale, also known as a summated rating scale, is one of the most widely used scales in health behaviour research. It is widely used in instruments measuring opinions, beliefs and attitudes (Di Iorio 2005; DeVellis 2003; Zagumny & Brady 1998:175).

The Likert scale was chosen for this study because most researches used Likert scale for measuring items corresponding to HBM constructs (Adams, Hall & Fulghum 2014; Asare & Sharma 2012; Cao, Chen & Wang 2014; Jones, Smith & Llewellyn 2014; King, Singh, Bernard, Merianos & Vidourek 2012; Rawlett 2011; Saunders, Frederick, Silverman & Papesh 2013; Wang, Zang, Bai, Liu, Zhao & Zhang 2013; Zhao, Song, Ren, Wang, Wang, Liu, Wan, Xu, Zhou, Hu, Bazzano & Sun 2012).

The items developed for this study were presented as declarative statements that accompany a varying degree of agreement or endorsement response measured on five-point or three-point Likert scale format depending on the type of items. Odd numbered Likert scale format was used for this study so that study participants would have the option to rate at the mid-point.

3.3.2.4 Operational definitions

Although theoretical definitions can provide us the generic definitions of the constructs as defined conceptually, they don't provide us the definition as used in specific studies. The process of transforming concepts or constructs in to measurable variables is called operational definition.

For this study, the term scale rather than survey questionnaire was used as it is mostly referred as such in measurement field. A scale as defined for this study was an instrument that is used to measure the six constructs of the HBM and HIV testing intentions. Under each construct, items that can explain or represent the construct were indicated. Measurement scale is defined as measurement instruments that are collections of items combined into a composite score and intended to show levels of theoretical variables not explicitly observable by direct means (DeVeliis 2003).

Since it was difficult to measure variables or constructs directly, scales with various items under each construct were used as a proxy measurement. The following paragraphs describes items included in the initial items pool and operational definitions as it corresponds to each of the constructs as indicated below in Table 3.1.

Table 3.1:   Initial items pool for the HTBS

SN	Items
	Perceived Susceptibility
1	I am afraid that I might contract HIV
2	I believe that there is a chance of my getting infected with HIV/AIDS in the next one year
3	I believe that I might get HIV even if I am only having sex with one partner
4	I believe that I might be infected with HIV if my sex partner is having unsafe sex with others
5*	I believe that I am free of HIV because I have no HIV/AIDS related sign and symptoms
6*	I believe that I have no exposure for HIV/AIDS because I don't share sharp materials with other people
7*	HIV/AIDS is not my concern because I don't have any sexual exposure
8	I don't consider myself to be at risk for HIV
	Perceived severity
1	I believe that HIV/AIDS is non-curable disease and requires lifelong medication
2	I am afraid that HIV/AIDS could cause death or disability to me
3*	If I am infected with HIV, I believe that HIV/AIDS could disrupt my family, social and economic activities
4*	If I am infected with HIV, I believe that it could cause psychological problem to me
5	I would rather have any other terminal illness than AIDS
6	I would rather die from a violent death (e.g. gun shot, car accident, etc) than from AIDS
	Perceived benefit
1	I believe that HIV testing will provide me the option to know my HIV status and get emotional relief
2	I feel that HIV testing will help me plan to avoid infection in the future
3*	HIV testing provides me the option to get early treatment before getting seriously sick
4*	I believe that I can plan my future with full confidence through having HIV testing
5*	I believe that HIV testing would help me avoid transmitting HIV to others without knowing my status
6*	I believe that HIV testing help me identify my sexual partner for the future
7	I don't believe that knowing my HIV status could improve the effect of HIV/AIDS on my health
	Perceived barrier
1*	I am afraid to take HIV testing for fear of hearing HIV positive result
2	I am afraid of the stigma attached to HIV positive result
3	I am afraid of separation from my friends and families due to my HIV positive result
4	I don't want to wait long time at HIV testing facilities in order to have HIV testing
5	I am embarrassed to ask for HIV testing at HIV testing facilities
6*	I am worried about confidentiality at HIV testing facilities
7	I am afraid that I may lose my partner if I tested for HIV

SN	Items
8	I don't want anyone to know that I'm sexually active/ at risk
9	I am afraid that people may talk about me if I got to for HIV testing
10*	I believe that HIV testing currently being offered provides accurate test
11*	I am afraid that HIV testing procedure is painful because of needle pricks and other procedures
12*	I am afraid blood and other contamination during HIV testing may happen to me
13	I know where I can get free HIV testing
14	People will look down on me if I am HIV positive
15	I will not be accepted by the society if I am HIV positive
16	I may find out I am HIV positive
17	People who do the test will know my HIV test result
18	I will have to wait for long time for the HIV test result
	Perceived self-efficacy
1	For me it would be easy to have HIV testing performed
2	I am confident that I can convince my girl/boyfriend to go for HIV testing
3	I am confident that I can deal with health workers who are providing HIV testing services in order to get tested
4*	I am confident that I can manage the physical pain and effects of HIV/AIDS from interfering with my daily life and future plans
5*	I am confident that I can manage the emotional disturbances caused by HIV positive result from interfering with my normal daily life and future plans
6	I am confident that I can change my current risky sexual behaviour after negative HIV test result
7*	I am confident that I will remain faithful with my partner after my negative HIV test result
8*	I am confident that I will use condoms properly and consistently to avoid future HIV risk after negative HIV test result
9	I am confident that I will limit the number of sexual partners to avoid future HIV risk after HIV testing
10	I can get HIV/AIDS treatment right away if I need it
	Cues to action
1*	I recall seeing TV, billboards, posters messages about the importance of HIV testing during the past one year
2	During the past one year, I have received advice from a health professional about HIV testing
3*	During the past one year, I recall some form of HIV testing promotion in the campus
4	My girlfriend/boyfriend usually thinks that it is good if I am tested for HIV
5	My parents insisted that I should be tested fro HIV
6*	I have many friends who are tested for HIV
7	I know people close to me who are ill with HIV/AIDS

SN	Items
8*	I was asked to get tested for HIV as a requirement to donate blood or to go to abroad or other circumstances
9	I was sick with HIV/AIDS like disease in the past
	HIV testing intention
1	How likely are you in need of HIV counseling and testing service the next time you go for health care services?
2	How likely are you to get tested for HIV in the next three months?
3	How likely are you to do regular HIV testing in the future?

Items are generated from the qualitative in-depth interview study. The rest are generated from literature review.

Perceived susceptibility: It was represented by eight items in the initial items pool. The items were measured with a five-point Likert scale values ranging from Strongly agree (5) to Strongly Disagree (1). The total value for a respondent was to be assumed ranging from 8 to 40 points.

Perceived severity: This construct was represented by six items in the initial items pool. The items were measured using a five-point Likert scale value ranging from Strongly agree (5) to Strongly Disagree (1). The total value for a respondent was assumed to be ranging from 6 to 30 points.

Perceived benefits: It was represented by seven items in the initial items pool. The items were measured with a five-point Likert scale value ranging from Strongly agree (5) to Strongly Disagree (1). The total value for a respondent was ranging from 7 to 35 points.

Perceived barriers: This was represented by 18 items in the initial items pool with a five-point Likert scale value ranging from Strongly agree (5) to Strongly Disagree (1). The total value for a respondent was ranging from 18 to 90 points.

Perceived self-efficacy: This construct was represented by ten items in the initial items with a five-point Likert scale value ranging from Strongly agree (5) to Strongly Disagree (1). The total value for a respondent was ranging from 10 to 50 points.

Cues to action: This construct was represented by nine items in the initial items pool with a three-point Likert scale value ranging from Disagree (1) to Agree (3). The total value for a respondent was ranging from 9 to 45 points.

Voluntary HIV testing intention: This construct was represented by three items in the initial items pool with a five-point Likert scale dealing with HIV test intentions among university students. The total value for a respondent **was ranging** from 3 to 15 points.

3.3.2.5   Final item pool content validity assessment by experts

The objective of content validity was to confirm that the item written for the instrument adequately represent the constructs. The review was done by three experts. The first expert had Masters of Public Health and had content expertise on HIV testing and counseling. The second expert was a statistician and had completed M.Sc. in measurement. The third expert had Masters of Public Health and was doing his PhD on health education and behaviour and had rich experience on HIV programmes. The experts were asked to make judgments on the relevance of each item with regards to the constructs under each component of HBM and also experts were asked to suggest revisions, including addition or deletion of items. As indicated on Annex K, the experts were provided with content validity assessment form that contains 61 items and instruction that explains the conceptual model-HBM, description of the scale and relevancy rating scale through e-mail. The items were rated on a four-point scale from strongly disagree (1) to strongly agree (4).

As indicated below in Table 3.2, Content validity index (CVI) was calculated for the three experts based on the percentage of items rated 3 or 4 from all the items and average percentage was calculated for the three experts based on Waltz, Strickland and Lenz (1991) recommendation. The first content expert rated 93.4% (57 items from 61 items) as either 3 or 4. The second content expert rated 90.1% (55 items from 61 items) as either 3 or 4. And the third expert also rated 90.1% (55 items from 61 items) as either 3 or 4. The CVI for the total scale is calculated as the average of the three experts which is 91.2%, which is greater than the cut of point as per Waltz et al (1991) recommendation of at least 90% CVI.

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Experts also reviewed the items' wording and suggested rewording of 16 items because of double negatives and double barreled statements. The experts also suggested inclusion of some negatively formatted items especially for self-efficacy which resulted in rephrasing of five items under self-efficacy construct. One item was deleted because of irrelevance and four extra items were added based on the experts comment to split some of the items and addition of extra items. Finally, the item pool contained a total of 64 items which was used for further validation in the piloting study.

Table 3.2:   Relevancy rating by experts and result of content validity index (CVI)

Items	Relevancy rating by experts (1-4)		
	Expert 1	Expert 2	Expert 3
Perceived Susceptibility			
I am afraid that I might contract HIV	4	4	4
I believe that there is a chance of my getting infected with HIV/AIDS in the next one year	4	2	3
I believe that I might get HIV even if I am only having sex with one partner	4	3	4
I believe that I might be infected with HIV if my sex partner is having unsafe sex with others	4	4	4
I believe that I am free of HIV because I have no HIV/AIDS related sign and symptoms	3	3	4
I believe that I have no exposure for HIV/AIDS because I don't share sharp materials with other people	4	2	4
HIV/AIDS is not my concern because I don't have any sexual exposure	4	3	4
I don't consider myself to be at risk for HIV	2	4	3
Perceived severity			
I believe that HIV/AIDS is non-curable disease and requires lifelong medication	4	4	3
I am afraid that HIV/AIDS could cause death or disability to me	4	3	4
If I am infected with HIV, I believe that HIV/AIDS could disrupt my family, social and economic activities	4	3	4
If I am infected with HIV, I believe that it could cause psychological problem to me	4	3	4
I would rather have any other terminal illness than AIDS	3	2	3
I would rather die from a violent death (e.g. gun shot, car accident, etc) than from AIDS	3	4	4

Items	Relevancy rating by experts (1-4)		
Perceived Susceptibility	Expert 1	Expert 2	Expert 3
Perceived benefit			
I believe that HIV testing will provide me the option to know my HIV status and get emotional relief	4	3	3
I feel that HIV testing will help me plan to avoid infection in the future	4	4	4
HIV testing provides me the option to get early treatment before getting seriously sick	4	3	4
I believe that I can plan my future with full confidence through having HIV testing	4	4	4
I believe that HIV testing would help me avoid transmitting HIV to others without knowing my status	4	3	4
I believe that HIV testing help me identify my sexual partner for the future	4	3	2
I don't believe that knowing my HIV status could improve the effect of HIV/AIDS on my health	3	3	3
Perceived barrier			
I am afraid to take HIV testing for fear of hearing HIV positive result	3	2	4
I am afraid of the stigma attached to HIV positive result	4	3	4
I am afraid of separation from my friends and families due to my HIV positive result	4	3	4
I don't want to wait long time at HIV testing facilities in order to have HIV testing	4	3	4
I am embarrassed to ask for HIV testing at HIV testing facilities	4	3	4
I am worried about confidentiality at HIV testing facilities	4	4	4
I am afraid that I may lose my partner if I tested for HIV	3	4	3
I don't want anyone to know that I'm sexually active/ at risk	3	3	3
I am afraid that people may talk about me if I got to for HIV testing	4	3	3
I believe that HIV testing currently being offered provides accurate test			4
I am afraid that HIV testing procedure is painful because of needle pricks and other procedures	4	4	3
I am afraid blood and other contamination during HIV testing may happen to me	3	4	3
I know where I can get free HIV testing		4	4
People will look down on me if I am HIV positive	4	4	3

Items	Relevancy rating by experts (1-4)		
Perceived Susceptibility	Expert 1	Expert 2	Expert 3
I will not be accepted by the society if I am HIV positive	4	4	3
I may find out I am HIV positive		3	1
People who do the test will know my HIV test result	4	3	3
I will have to wait for long time for the HIV test result	4	3	3
Perceived self-efficacy			
For me it would be easy to have HIV testing performed	4	3	4
I am confident that I can convince my girl/boyfriend to go for HIV testing	4	4	3
I am confident that I can deal with health workers who are providing HIV testing services in order to get tested	4	4	4
I am confident that I can manage the physical pain and effects of HIV/AIDS from interfering with my daily life and future plans	4	3	4
I am confident that I can manage the emotional disturbances caused by HIV positive result from interfering with my normal daily life and future plans	4	4	4
I am confident that I can change my current risky sexual behaviour after negative HIV test result	4	3	2
I am confident that I will remain faithful with my partner after my negative HIV test result	4	4	2
I am confident that I will use condoms properly and consistently to avoid future HIV risk after negative HIV test result	4	4	2
I am confident that I will limit the number of sexual partners to avoid future HIV risk after HIV testing	4	4	2
I can get HIV/AIDS treatment right away if I need it	4	3	3
Cues to action			
I recall seeing TV, billboards, posters messages about the importance of HIV testing during the past one year	3	3	4
During the past one year, I have received advice from a health professional about HIV testing	4	3	4
During the past one year, I recall some form of HIV testing promotion in the campus	4	4	4
My girlfriend/boyfriend usually thinks that it is good if I am tested for HIV	4	3	4
My parents insisted that I should be tested for HIV	4		4
I have many friends who are tested for HIV	4	4	4
I know people close to me who are ill with HIV/AIDS	4	2	4

Items	Relevancy rating by experts (1-4)		
Perceived Susceptibility	**Expert 1**	**Expert 2**	**Expert 3**
I was asked to get tested for HIV as a requirement to donate blood or to go to abroad or other circumstances	4	3	4
I was sick with HIV/AIDS like disease in the past	4	3	4
HIV testing intention			
How likely are you in need of HIV counseling and testing service the next time you go for health care services?	4	4	3
How likely are you to get tested for HIV in the next three months?	4	4	4
How likely are you to do regular HIV testing in the future?	4	3	4
Content Validity Index (CVI) -% of items rated 3 or 4 by the experts	*93.4*	*90.2*	*90.2*
Average CVI- average percentages for the three experts	*91.3*		

3.3.2.6   Scale translation

The HIV testing belief scale (HTBS) was translated into Amharic by the researcher in order to prevent language barrier for the respondents. Amharic is the national language of Ethiopia and it was expected that all university students were fluent in Amharic. The questionnaire was translated back to English by a separate translator. There was no significant discrepancy except for some of the items for which correction was taken.

3.3.2.7   Pilot survey: Item administration to a development sample

3.3.2.7.1   Sample size and sampling procedure

After deciding the content validity of the instrument, the final scale should be administered to a sample that is sufficient to do some of the reliability and validity tests. Different authors provide different guideline on the size of the sample. For example, Streiner (1994) suggests 5:1 subjects to variable ratio if the total sample was larger than 100 subjects while the ratio should be 10:1 if there were fewer than 100 subjects in the sample. However, most agree that small (less than 100) produce unstable results and large sample (more than 300) produce more stable factor solutions (Di Iorio 2005). Because of resources and other factors, a sample size of 350 was initially planned to do

validation and reliability study for the HBM HIV testing scale. However, 318 students completed the questionnaire accounting for 91% response rate.

The piloting study was conducted among randomly selected classes of accounting, management and economics students. All students who were attending their study in these randomly selected classes were included for this study.

3.3.2.7.2 Data collection process

Two university student counsellor members facilitated the data collection in February 2015 after receiving half-day training on the overall objective of the study, ethical considerations, data collection tool and procedures. The data collection facilitators explained purpose of the study and instruction for filling out the self-administered questionnaire to class of students whose class was randomly selected for the study. Students who were willing to participate in the study signed on the written consent form before filling out the questionnaire. The informed consent and the self-administered questionnaire were unrelated in any way in order to keep identification of students confidential. After the signed consent forms had been collected from the students, the students were provided with self-administered HTBS and the data collection facilitators provided brief orientation on how to fill out the scale. A box was put in the corner of the class where students had to put a completed scale. This had ensured the confidence of students that no one would link their scale with name identifier indicated in the consent form.

3.3.2.7.3 Ethical considerations

Protecting the rights of the study participants

The study participants were given the full autonomy to decide on whether to participate or not to participate on the pilot study. Participation on the study was entirely based on volunteerism. Informed consent (Annex P) explaining objective of the study, procedures, potential risk and discomforts, confidentiality and other issues was provided to participants before the start of the data collection. The participants were given enough time to read through the consent form and were asked to sign the form if they could volunteer to participate in the pilot study.

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It was explained to the participants that there was no direct benefit that was to be gained by the interviewees from participating in this study. However, it was explained to them that the results of this study could contribute to the knowledge regarding HIV testing behaviour in university students and help in designing HIV testing programmes in university settings in Ethiopia.

There was no significant risk or discomfort related to participating in the study except minor discomfort attached to answering some personal and sensitive questions. Participants were advised to contact the investigator of the study for a referral to receive psychological and social support, had they experienced any discomfort.

After collecting the signed informed consent, a self-administered anonymous questionnaire was distributed to those who volunteered for the study. The participants were advised to put completed questionnaire in a box put at the corner of the room so that participants had confidence that no one could trace any questionnaire with participants.

The completed questionnaires were kept properly in a lockable cabinet after data entry was done. Data set was kept password protected. The completed questionnaires will be disposed and destroyed permanently after five years from the completion of the write up of the study.

Protecting the rights of the institution

Ethical clearance was obtained first from Health Studies Higher Degree Committee of UNISA (Annex D) and later locally in Ethiopia from National Research Ethics Review Committee of Ministry of Science and Technology (Annex H). Letters written from UNINSA-Addis Ababa Regional Office (Annex F) and Ministry of Science and Technology (Annex H) were presented to Addis Ababa University where the study was conducted. The university official approved the conduct of the study and contacted respective departments and colleges for further facilitation of data collection (Annex J).

Scientific integrity of the researcher

The investigator holds Masters of Public Health and had successfully completed PhD proposal modules at UNISA, hence was able to conduct this study as per the standard set by UNISA. The investigator of the study had followed objectively verifiable procedures and rules that govern the conduct of scientific enquiry. Study findings can be re-checked and verified through checking data collection and analysis procedures and documents. The investigator had no conflict of interest with the topic under investigation.

3.3.3 Phase III: Cross-sectional survey

This was the third and dominant phase of the study that was aimed at addressing specific objective 2 and part of specific objective 1. The study utilised a cross-sectional survey design. Cross-sectional survey collects data at one specific point in time (a snapshot of the health experience of a population) and can be used to determine attitudes, beliefs, values, behaviour and characteristics of a given population (Hennekens & Buring 1987; Cottrell & McKenzie 2011).

3.3.3.1 Variables of the study

Dependent variables

The dependent variables for this study were *HIV testing intention* and *HIV testing history in the past one year*. HIV testing intention was measured using Likert scale items as described under the operational definition. History of HIV testing in the past twelve months during the study period was assessed using a dichotomous 'Yes/No' response questions.

Independent variables

The independent variables were:

Modifying variables: These included socio demographic variables (age, sex, ethnicity, education status, marital status, religion and etc.) and Knowledge about HIV/AIDS.

HMB constructs: These included the six components of HMB (perceived severity, perceived susceptibility, perceived benefit, perceived barrier, perceived self-efficacy, cues to action).

3.3.3.2 Sampling

A random sampling technique was utilised based on the objectives of the study and research design.

3.3.3.2.1 Population

In Ethiopia, according to FMOE statistics, there were thirty one public universities in 2014 offering undergraduate and postgraduate programmes under various disciplines (FMOE 2015). All the universities receive students from all over the country, offering a diversified community for the study. The study population for this survey included only undergraduate students who were attending their education in various departments during the study period. About 294,357 undergraduate students were enrolled in these public universities during 2012/13 Ethiopian academic year (FMOE 2013: 57).

Debre Berhan University was one of the thirty-one universities that enrolled 10,647 students in the regular undergraduate students attending their study in nine colleges. Around 3325, 2822, 2846 and 1654 students were enrolled in Year I, Year II, Year III and Year IV or greater respectively.

3.3.3.2.2 Sample and sampling procedure

The following assumptions were used in order to calculate sample size: 95% confidence interval, proportion of young university students who had history of HIV testing in the past one year equals to 58.5%% (Tsegay et al 2011) and marginal error of 5%. Considering design effect of 1.5 and non-response rate of 10% and using the following formula, the sample size was estimated to be 614 students.

$$n = \frac{1.96^2 p(1-p)(DEFF)}{d^2}$$

Replacing, p=0.59, d=0.05, design effect (DEFF)=1.5, CI=95%, in the above formula and with non-response rate of 10%, the total sample size was calculated to be 614.

As indicated in detail in Figure 3-1, a two-stage sampling procedure was employed in a phased approach. One university was selected by simple random sampling in the first stage of sampling.
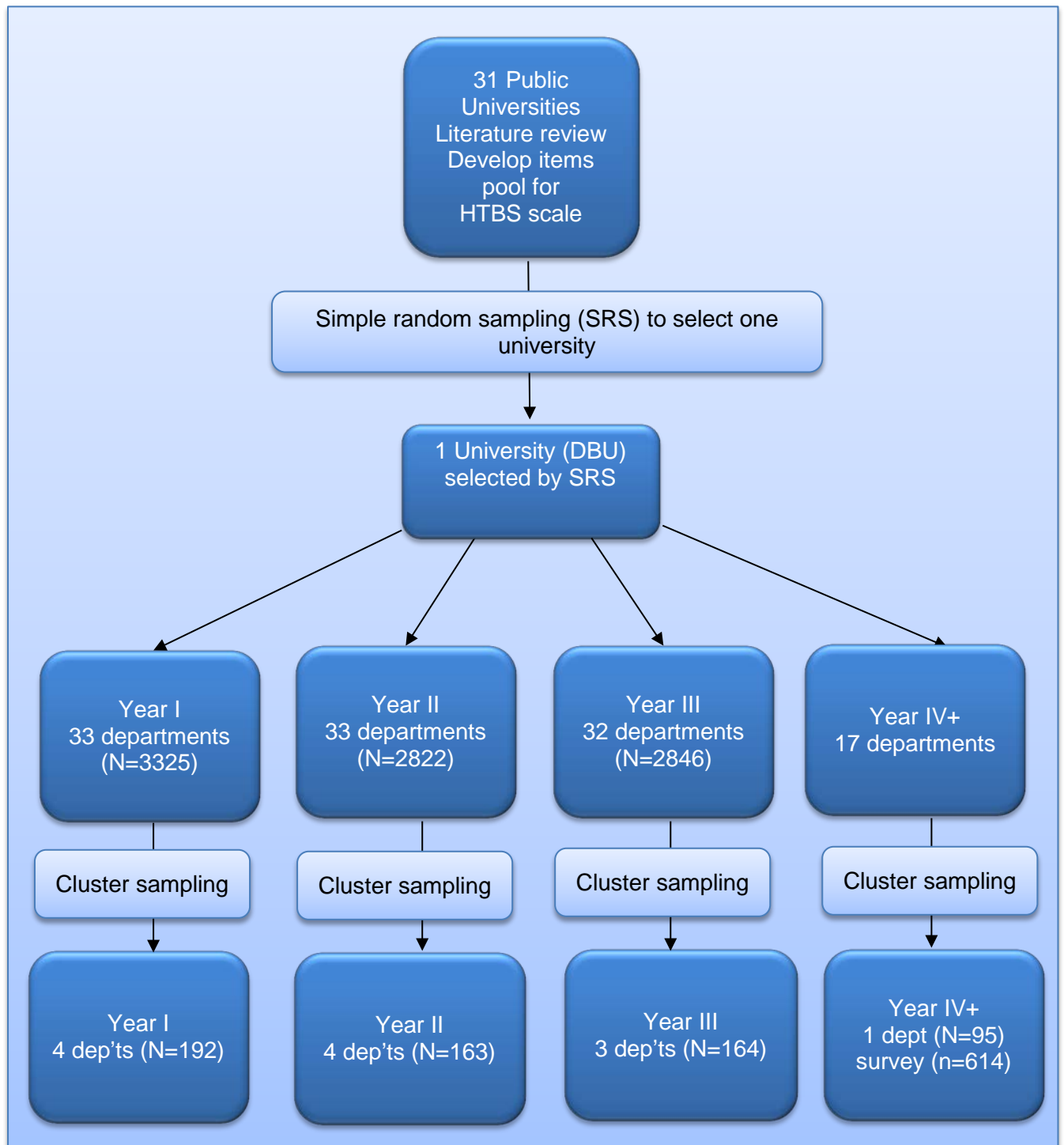
Figure 3.1: Sampling procedure for the cross-sectional survey

In the second phase of sampling procedure, a stratified sampling procedure based on class year proportion to size was employed to select students. For the purpose of this study, class year was classified into four strata. Year I, II, III and IV+ each belonging to students in their first, second, third and fourth or greater year of study respectively were strata for the study. The total sample size (614) was allocated to the four categories of class years based on proportional to the size of the class years. Accordingly, 192 for Year I, 163 for Year II, 164 for Year III and 95 for Year IV+ were assigned and planned initially. The departments under each class year were considered as clusters. The number of departments that needed to be selected under each class year was decided based on the average number of students enrolled under departments in each class year. Accordingly, four departments were allocated for each of class Year I and Year II. Three and two departments were allocated for Year III and Year IV+ respectively. Departments from each class year were selected using simple random sampling and all students in the selected departments were included in the study.

During data collection, a total of 612 (195 in Year I, 147 in year II, 170 in year III and 100 in year IV+) had completed the HTBS.

3.3.3.2.3 *Inclusion and exclusion criteria*

Public universities were included in the study. All undergraduate students in the regular program who were available during the study period were included in the study. Postgraduate students and non-regular students in the summer, night and distance learning programmes were not included in the study. Students such as people with visual impairment who were not able to write using paper and pen were not included in the study.

3.3.3.2.4 *Ethical issues related to sampling*

Ethical clearance was first obtained from UNISA Health Studies higher degree committee (Annex D). In country ethical clearance and permission to conduct the study was obtained from Ministry of Ethiopian Science and Technology (Annex H) and also letter written from UNISA regional office in Addis Ababa contacted Debre Berhan

University (Annex G). A letter was submitted to Debre Berhan University and permission was secured to do data collection on students (Annex I).

All universities and study participants were provided equal chance of selection through implementation of random sampling techniques.

3.3.3.3 Data collection

3.3.3.3.1 Data collection approach and method

Data collection was done through a self-administered anonymous HIV testing belief scale (HTBS) developed and refined using in-depth interview, content validity assessment and Exploratory factor analysis (EFA) in the previous chapters(Annex N and O) .

A university lecturer who held a Master's degree in Public Health (MPH) facilitated data collection through the self-administered HTBS after receiving a half- day orientation on the overall objective of the study, ethical considerations, sampling procedures, data collection tool and procedures. Data collection guide was prepared and provided to the data collection facilitator in order to guide the overall data collection process (Annex Q). The data collection facilitator explained purpose of the study and instruction for filling out the self-administered questionnaire to class of students whose class was randomly selected for the study. Information on the consent from (Annex P) was read to study participants and verbal consent was secured from the study participants and students were communicated that participation on the study was totally volunteerism based and they could withdraw at any stage in the data collection process.

After getting verbal consent from the study participants, the students were provided with self-administered HTBS questionnaire and the data collection facilitators provided brief orientation on how to fill out the scale. A box was put in the corner of the class where students had to put a completed scale. This was done to ensure that students wouldn't worry about the fact that the responses they provided on the scale were not seen by the data collection facilitator thereby ensuring confidentiality of the information.

3.3.3.3.2 Ethical considerations related to data collection

A verbal consent that was describing the aim of the study, risks that may be related to discomfort from asking some sensitive questions, possibility of withdrawing from the study if uncomfortable was read to the participants. Verbal consent was used in the cross-sectional survey because students were not comfortable with reading and signing a consent form and advised the investigator to read for them in the interest of time. Students were told that they had the right to withdraw from the study at any point of the data collection process. The self-administered scale was anonymous and there was no way of linking participants' information with any identifier. The completed questionnaires were kept in a lockable cabinet and will be discarded after 5 years after the full publication of this thesis.

3.3.3.3.3 Data analysis

Data were entered and analysed using the latest SPSS Version 20 software. Both descriptive and inferential statistics was utilised in order to analyse the data. Frequency, cross tabulations and correlations were run. Internal consistency of the items under each component of HBM was analysed using Cronbach's Alpha (Alpha coefficient). CFA was done to analyse and finalise the HTBS using computer software called Lisrel 9.2. Bivariate analysis including Independent samples T-test, analysis of variance (ANOVA), Chi-square test, Pearson correlations and binary logistic regression were performed to analyse the relationship between various dependent and independent variables. Multiple linear regressions was run in order to test which HBM constructs and modifying variables were more likely in predicting HIV test intentions while controlling the effect of the rest of the variables. Binary logistic regression was also run in order to test which of the HBM elements and modifying variables predict recent history of HIV testing.

3.4   INTERNAL AND EXTERNAL VALIDITY OF THE STUDY

3.4.1 Phase I: Qualitative study – in-depth interview

Creswell (2009) explains that validity and reliability in qualitative study do not have the same interpretations as it do in quantitative study. Yin (2003) and Gibbs (2007) suggest

certain reliability procedures and document each procedure followed in the study. For example, Gibbs (2007) advises to check transcripts if there is no mistake and also to check if the meanings of the codes used in the study are consistent.

In the current study, all the in-depth interviewing procedures and data analysis were documented clearly. Interviews were tape recorded using digital audio recorder. Notes were also taken for each interview for selected issues. Transcription was done by the investigator and transcripts were thoroughly read and corrections were taken in cases where there was ambiguity or lack of clarity. Coding was done by the investigator of the study and lists of codes were maintained in a separate work sheet so that codes were consistently used in the coding process. Moreover, coding using the OpenCode software facilitated correct and consistent use of codes.

Validity also called by different terms such as trustworthiness, authenticity and credibility deals with whether the results of qualitative research are accurate from the perspective of the researcher, the participant and the reader (Creswell & Miller 2000; Lincoln & Guba 2000).

Creswell (2009) suggests use of strategies such as triangulation of different sources, cross-checking with study participants if the findings are accurate, use of thick and rich descriptions such as describing the setting, clarifying biases of the researcher, presenting negative or discrepant information that are against the main findings, spending long time in the field, reviewing the entire project by external auditor.

In the current study, the investigator was aware of his own biases and managed to situate himself independently as much as possible even though it was difficult to totally avoid such biases. The investigator has spent adequate time to conduct the interviews and also understand the overall context of university life and HIV testing situations in the campuses. Another expert who was doing his PhD on qualitative study has inspected some of the interview transcripts and compared with the research report and has provided feedback on the construction of some of the codes and the categories.

3.4.2 Phases II and III: Development of HTBS and cross-sectional survey

Data quality was maintained through activities ranging from training of data collection facilitators to supervision and piloting of the questionnaire. Data collection guide (Annex R) was prepared and experienced data collection facilitators strictly followed the guide. The principal investigator supervised the overall data collection processes.

Content validity assessment was done by three experts to determine whether the items in the scale cover each of the six components of the HBM and HIV testing intention which demonstrated a CVI of >90% indicating acceptable content validity.

A pilot study was conducted to determine the reliability and validity of the HTBS and revision based on the reliability and validity analysis of the scale was done. The reliability analysis indicated that all the six constructs of HBM and HIV testing intention indicated a Cronbach's alpha value of >0.70.

Moreover, multivariate analysis such as multiple linear regression and binary logistic regression was done to control confounding factors. This has created the opportunity to pin point out the effect an independent variable after controlling the effect of other independent variables.

However, the findings of this study can only be generalised to university students in Ethiopia and perhaps for developing countries in similar contexts. However, it is very difficult to generalise the findings of this study for other demographic groups of the society limiting the external validity.

3.5   CONCULUSION

In summary, this chapter has dealt with the research design and details regarding research methods. In this study, a mixed (qualitative followed by quantitative) study approach was employed. The exploratory mixed method approach was used in three phases for this study. The first phase was an exploratory qualitative study that employed in-depth interview of university students. The second phase was a pilot study that was intended to finalise development of research instrument for the main study. The dominant and third phase of the study used a quantitative (cross-sectional survey

design) that enrolled randomly selected university students in order to further refine the HTBS and test the research hypothesis related to prediction of HIV testing intention and behaviour.

In the next three chapters, findings and interpretations of Phase I (qualitative: in-depth interview), Phase II (development of HTBS and EFA using data from the pilot survey) and Phase III (CFA and hypothesis testing using cross-sectional survey) will be presented in detail.

CHAPTER 4

ANALYSIS, PRESENTATION AND DESCRIPTION OF THE FINDINGS OF THE IN-DEPTH INTERVIEW

4.1   INTRODUCTION

In Chapter 3, methodological issues related to the qualitative study (In-depth interview) component of the study were addressed in great detail in addition to the other methods. The current chapter deals with data management, analysis, presentation and interpretations of in-depth interview findings.

The results and interpretations of the in-depth interviews are presented based on the six constructs of the HBM: perceived susceptibility, perceived severity, perceived benefit, perceived barrier, perceived self-efficacy and cues to action. HIV testing intention was also presented and interpreted along with the other themes. General knowledge about HIV/AIDS was also presented as background information. Because the purpose of the in-depth interview was to provide information for the development of items for the HTBS, emphasis was given to the identification of issues for item development in the presentation and interpretation of the in-depth interview.

4.2   DATA MANAGEMENT AND ANALYSIS

Interviews were transcribed by the investigator which helped to understand the data in a great detail and depth as suggested by Fade and Swift (2010). Transcription was done in English from an interview which was originally done in Amharic. Transcriptions were read again and again to come up with final edited transcripts which were ready for analysis. Transcriptions in word format were transported to OpenCode version 3.6.2.0, qualitative data management and analysis software, developed by UMDAC and Epidemiology, University of Umea for coding and further analysis.

Concepts from the framework and content analysis of qualitative data analysis methodology was used to analyse the data and guide data analysis (Smith & Firth 2011; Ward, Furber, Tierney & Swallow 2013; Leech & Onwuegbuzie 2008; Graneheim &

Lundman 2004; Thyme, Wiberg, Lundman & Graneheim 2013; Gale, Heath, Cameron, Rashid & Redwood 2013; Hsieh & Shannon 2005:1277-1288). The framework approach was developed in the 1980s by social policy researchers at the National Centre for Social Research as a method to manage and analyse qualitative data in applied policy research and currently has been gaining popularity in managing and analysing data from the health care research (Smith & Firth 2011).

The framework approach has many similarities with thematic analysis approach. It enables researcher to clearly and transparently indicate the analytical processes by showing a series of interconnected stages that enable researcher to move back and forth across the data until coherent and meaningful patterns emerges (Ritchie & Lewis 2003). Content analysis has been used widely in nursing research and education (Graneheim & Lundman 2004). The analysis process is not a linear procedure and it is rather a back and forth process of searching for meaning in the data (Srivastava & Hopwood 2009; Darawsheh 2014; Graneheim & Lundman 2004).

The following concepts were used during analysis and their corresponding meaning was presented below.

A meaning unit: is a group of words or statements that relate to the same central meaning. It is also referred to as a content unit or coding unit (Baxter 1991). The unit of analysis for this study was considered to be individual interviewees or each interview (Polkinghorne 2005:139).

A code: The label of a meaning unit is referred to as a code (Thyme et al 2013). It is also called index or a node attached to a piece of data (Braun & Clarke 2006; Fade & Swift 2010; Hsieh & Shannon 2005: 1277-1288).

A category is a group of content that shares a commonality in terms of meaning or concepts (Krippendorff 1980).

Using OpenCode version 3.6.2.0, each interview transcript was read carefully and codes were assigned to a meaning units (words, phrases, statements and paragraphs) as applicable using concepts from the six constructs of the HBM. HIV testing intention was also considered as one category for analysis. New issues that could be utilised to

the development of new items for the HTBS were captured and indicated for further consideration of inclusion in the scale. Moreover, after coding was completed with all the 26 interviews, the codes were grouped under categories based on the six constructs of the HBM, knowledge about HIV/AIDS and HIV testing intention.

The HBM was used as a guiding theoretical framework to analyse the data. The interview transcripts were thoroughly read, and codes were assigned to words or phrases or statements based on the concepts and theories of HBM. Since the main purpose of the in depth interview was to explore and identify items for the HTBS scale in the Ethiopian context, concepts which were potential sources for item writing were noted under each construct of the HBM. Based on the in-depth interview findings, new items were added and modifications were made for HTBS.

4.3   IN-DEPTH INTERVIEW RESULTS

4.3.1   Characteristics of in-depth interview participants

The age of respondents ranged from 18−24 years with a mean value of 21. The majority of the in-depth interview participants were male (69.2%) and year III students (73.1%). Around fifty four per cent of the in-depth interview participants had been tested for HIV at least once in their life time. Detailed information on in-depth interview participants is presented in Table 4.1.

Table 4.1: **Characteristics of in-depth interview participants (N=26)**

Variables	Frequency	%
Age (years)		
Mean age: 21, SD=1.81		
Range: 18-24		
Gender		
Male	18	69.2
Female	8	30.8
Total	26	100.0
Class year		
I	6	23.1
II	1	3.8
III	19	73.1
Total	26	100.0
Department		
Biology	15	57.7
Accounting	11	42.3
Total	26	100.0
HIV tested		
Yes	14	53.8
No	12	46.2
Total	**26**	**100.0**

4.3.2 Main findings of the in-depth interview

The result of the in-depth interview was presented based on the six constructs of the HBM: perceived susceptibility, perceived severity, perceived benefit, perceived barrier, perceived self-efficacy and cues to action. General knowledge about HIV/AIDS and HIV testing intention was also presented as background information.

4.3.2.1 *General knowledge about HIV/AIDS*

Knowledge questions such as HIV transmission mechanisms, means of prevention, HIV/AIDS treatment and perceptions or feeling about people living with HIV/AIDS were presented to participants during the in-depth interview to get background information before exploring HIV testing in the context of HBM. Almost all in-depth interview participants correctly mentioned the commonly known transmission mechanisms in

developing countries: unsafe sexual practices, direct contact with blood, mother-to-child transmission and communal use of sharp materials.

For example, a 22-year-old male student explained the HIV transmission mechanisms as follows:

> *...obviously HIV/AIDS is transmitted by blood contacts; that means HIV is transmitted when we are engaging in unsafe sex; and also communal use of sharp materials such as use of needle and blade. It is also transmitted through mother to child. But when it comes to campus life, unsafe sex is the main means of transmission mechanism.*

Only one individual mentioned intravenous drug use, which is rarely practised in Ethiopia as a transmission means as a 21 years old female student explains below:

> *Now people are using drugs and harmful things and other things as a sign of modernity and this can lead to different transmissible diseases.*

Similarly, almost all in-depth interview participants were aware of the HIV/AIDS prevention means. Abstinence, being faithful with one's partner and use of condom were consistently mentioned as prevention methods by almost all in-depth interview participants. Eighteen years old female student, who had been tested for HIV before, describes prevention mechanisms as follows:

> *The prevention mthods are the ABC rules which are abstinence, use of condom, and faithfulness to one' s partner and avoid communal use of sharp materials.*

Moreover, some of in-depth interview participants added more comprehensive prevention strategies such as precautions during blood transfusions, awareness creation and behavioural change interventions, prevention of mother to child transmission (PMTCT), avoiding communal use of sharp materials or sterilisation of sharp materials and HIV counseling and testing among others. For example, a 19-years-old male student who had never been tested for HIV further adds on the prevention mechanisms as follows:

The best option for young people like us is to abstain. As many people believe that condom can prevent 85% of the transmission, use of condom prevents HIV. I believe that abstinence is the best option. The other option is to check mothers' for their HIV status before they deliver. And the other option is to check blood before transfusion; and finally avoid sharing of sharp materials.

Most of the in-depth interview participants demonstrated a favorable attitude towards people living with HIV/AIDS. However, most of the participants underlined the fact that strong precautions should be taken in all aspects so that HIV was not transmitted to them. In line with this, a 20-years-old female student describes her beliefs as follows:

If I encounter HIV positive people, I will have good attitude towards them and this will be done through protecting me from getting infected by the virus by avoiding communal use of sharp materials and blood contacts. I will consider them like any human being and I can be together with them.

A 23-years-old female student, who had a relative who was living with HIV, described her experiences as follows:

I know one person who is a relative of mine and is infected with HIV. There is no special thing about him, our relationship is normal and if I also meet another person, I will feel same unless there is blood contact or situations that expose me.

Most of the participants were willing to eat, live, share clothes, hug and be friends other than having sexual partnerships with PLWHAs. Almost all in-depth interview participants mentioned importance of providing care and support, showing empathy and have said that they were considering PLWs like any other people. Some of the participants have come across PLWAs in their daily life circumstances and some have off course lived with PLWAs. These individuals have demonstrated favorable attitude to PLWAs.

A male student described his attitudes as follows:

When I was in elementary school because I didn't have the awareness, I used to fear people living with HIV/AIDS. But after joining preparatory college, I learned that HIV is not an easily transmitted disease. I used to chat with people living

with HIV/AIDS except kissing. I knew it was not transmitted through kissing. Since I knew the transmission mechanisms and I knew that it was not transmitted through kissing, eating/drinking together, now I can approach PLWAs and ask them how they acquire the disease and discuss with them how they can live a positive life.

In conclusion, even though most of the students demonstrated a favorable attitude towards PLWAs in theory, it seems that it is more complicated when people encountered PLWAs in their real world life. The following story encountered by a female student pretty much explains the complexity in the society.

I have lived with HIV positive partners as neighbors without knowing that they really had HIV. They were one lady living with her husband and two kids (a 12 years old child and 9 year old child) who shared the same compound with our family. I didn't know that she had HIV for long time and I have eaten with her. I knew HIV exist and I really feared it. I feared living with HIV positive people. She was very much sick some times and she didn't talk about it. People talked in the neighborhoods about her that she had HIV and she was taking HIV medicine.

As expected, most of the in-depth interview participants had sufficient knowledge about HIV/AIDS. The finding on general knowledge about HIV/AIDS is consistent with the high level of knowledge findings from the findings of the cross-sectional survey.

4.3.2.2 Perceived severity

Participants were asked to give their views regarding severity or seriousness of HIV/AIDS in their own terms. A probe question to compare and contrast HIV/AIDS with other diseases was followed up based on their responses. Most of participants had a belief that HIV/AIDS is very serious disease. The in-depth interview participants expressed the severity of HIV/AIDS in terms of lack of cure and vaccine, fatality, physical and psychological infirmity, social and economic impacts and the need for life long care and management.

A 23-years-old male student who had been tested for HIV described severity of HIV/AID as follows:

As one of the diseases for which treatment is not available, I give HIV the highest rank. However, it is not a disease that kills abruptly unlike other diseases because if one can do exercise and take ART, and eat a balanced diet, then that person can live longer.

However, most of the participants believed that HIV/AIDS is not as bad as diseases such as cancer which are deadly. In line with this, a 22 male student described severity of HIV as follows:

For me, HIV/AIDS is not as such a serious disease unlike the other diseases. For example, our people are currently seeing very serious disease like cancer. But the people are considering HIV/AID as serious disease but I don't buy that. I consider diabetes as serious. For example I don't know the cause of cancer and I may catch cancer unlike HIV/AIDS, which you know the cause and can prevent it. You know, I don't give equal weight with cancer and diabetes, they are more serious. All the diseases have some common features related to the impact and the suffering. For example, HIV/AIDS may cause diarrhea and may be similar with typhoid and other diseases. But the difference with other diseases is that if especially you are not aware of your status, it will make you suffer if you don't go to hospital early.

Some of the participants believed that HIV/AIDS is not different from other diseases, if not less severe than most of the diseases as it can easily be preventable and treatable. A 21-years-old male student who had been tested for HIV explains as below:

To be honest, I will consider HIV/AIDS like any disease even though it is not curable. If for example I am going to be HIV positive, I don't feel special thing and if somebody is also going to be positive, I don't feel like he has missed something but I feel he have some disease but that disease is not curable like other diseases and he has to use drugs without interruption. The similarity with other disease is that all diseases are disease but HIV is not curable and it is a killer. In contrast to other disease, it kills young people who can contribute for the development of their nation.

The following ideas, which were not identified during literature review, were drawn from the in-depth interview analysis for development of two items for perceived severity construct:

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- Economic impact of HIV/AIDS

- Psychosocial impact of HIV/AIDS

The economic impact was put as follows by a 22-years-old male student:

> *Because of the illness, you will not do your job and as you know if you can't do your job in this country and hence HIV/AIDS has many impacts and that is why I am sacred about it.*

The psychosocial impact described by the in-depth interview participants includes: stigma and discrimination, being labeled as infidel and being cursed by God among others. For example, a 20-years-old female student described the psychosocial impact as follows:

> *I think it is a difficult disease. For me, the most difficult diseases in the world are cancer, diabetes and HIV. But I think HIV is better than others but in developing countries like Ethiopia since we are sharing many things; it will complicate many people's life. It will break up lovers. Other than killing, it will affect many families life unlike other diseases which can be treated and the effect of which end there.*

Perceives severity is missing in many of the studies because of the wide belief that HIV/AIDS is not perceived as a severe health condition by individuals consistently. The fact that perceived severity of HIV/AIDS was high among the in-depth interview participants was consistent with the current quantitative survey findings and some researches (Jani, Ashraf & Nothling 2013). The perception that HIV is a severe disease is still continuing in spite of improved quality of life of PLWHAs because of the wide use of ART and HIV/AIDS care and support services. This could be due to the economic and psychosocial impact of HIV/AIDS on individuals as also indicated in the current in-depth interview. The analysis of the in-depth interview supported the fact that stigma and discrimination was still an issue hindering job opportunity and living harmoniously with families and communities further leading to the belief that HIV/AIDS is a serious health and social problem.

4.3.2.3 Perceived susceptibility

Most of the in-depth interview participants felt that they had little or no exposure to HIV/AIDS. Those who believed having little exposure claimed exposure to sharp medical materials and other unnoticed circumstances other than sexual exposure. For example, a 20-years-old female student believed that she was rarely exposed to HIV and perhaps from accidental exposure to sharp materials.

> *Are you asking my exposure?...what wrong things did I do regarding HIV?...okay, may be rarely from sharp materials such as we were using needles communally but I was not as such exposed. I was rarely exposed to HIV.*

Some of the in-depth interview participants claimed that since they had no history of sexual exposure, so they believed that they had no exposure for HIV/AIDS. In line with this, a female student described her perceived susceptibility as follows:

> *Personally, I think there are no reasons that I could be infected by HIV. It may be transmitted to me from my family but my father and mother were tested for HIV and are free from HIV. Even though I was not tested because I haven't started sexual intercourse and I don't think I would be infected.*

Some of the in-depth interview participants acknowledged that since they are having sexual exposure, they had a belief that they might have been exposed to HIV/AIDS. For instance, the following statement by a 21-years-old female student supports this:

> *I have a boyfriend and we do sex some times and I sometimes thought about it and asked myself what I was doing and I was afraid of those circumstances may infect me. There is no deep trust and I do testing regularly and am free of HIV. I have always feared about it.*

The following ideas were noted for further development of items under perceived susceptibility construct:

- Feeling exposed to HIV/AIDS because of sharing sharp materials with others
- No HIV/AIDS sign and symptoms hence not susceptible to HIV/AIDS

- No sexual exposure hence not exposed to HIV/AIDS

Perceived susceptibility is a key component of HBM that predicts or explains HIV testing behaviour. In line with this, a systematic review of qualitative findings on factors enabling and deterring uptake of HIV testing in Sub-Saharan Africa by Musheke, Ntalasha, Gari, Mckenzie, Bond, Martin-Hilber and Merten (2013) found that perception of low risk to HIV/AIDS was indicated as a key barrier to HIV testing.

Perception of low susceptibility level towards HIV/AIDS in the in-depth interviews was not consistent with the cross-sectional survey finding. In the survey, 57% of respondents rated more than average value on the perceived susceptibility scale. This could be due to social desirability bias in which case students may report low susceptibility on face-to-face interview as compared to a self-administered questionnaire which they probably report the correct one.

4.3.2.4 *Perceived benefit*

Most of in-depth interview participants had the belief that HIV counseling and testing was beneficial for clearing out doubts regarding one's exposure and building confidence, planning one's future, protecting others, living a healthy life, identifying future partner, having early treatment before the disease becomes severe, and also for advising others to get tested. For example, a 21-years-old female student believed that HIV testing would benefit her in many ways as explained below.

> *I want to know myself. Isn't knowing one's status a benefit? My confidence and everything is about knowing yourself. That is when I can even advice my boyfriend about HIV testing. If you want to advice people, first you have to do yourself and if you didn't, you can't do that. It is not only for HIV/AIDS. It is beneficial to get screened for other diseases such as cancer. Being healthy is good thing and it makes you happy. If you are healthy, you will have confidence and you can plan for the future confidently. You are human being, when your health goes wrong, you will be affected and your confidence will be eroded and it really helps a lot as it is related to your health and future.*

However, some of the in-depth interview participants had the perception that it was preferable for them to not get tested because if in case they turned out to be HIV positive, their life may got complicated and they believe that they would lose hope and abandon their future plans.

> *I was not tested for HIV. Yes, I have thought about HIV testing but I couldn't do the testing because I believed that the benefit that I may get from not testing is better than the benefit I get from testing for HIV. This is because I was not engaged in that thing… (may be referring to sex). Until I reach a stage where I should test for HIV, I don't want to do it. This is b/c if I knew that I am positive, the feeling towards myself would be bad. And the tension/anxiety with having being tested is greater than not knowing it.*

It was clear from the analysis of the in-depth interviews that most of the participants knew the key benefits of having HIV counseling and testing even though having the test is actually difficult for them. The following issues were identified from the analysis of the in-depth interview for development of new items for perceived:

- HIV testing help planning one's future life
- HIV testing help not transmit to other people without knowing one' s status
- HIV testing help to identify future partner
- HIV testing help to get early treatment and improve health

The investigator of the study couldn't come across published studies that explored perceived benefit of HIV testing using qualitative study. The finding from the current in-depth interview supports the findings from the cross-sectional survey which indicated that perceived benefit of HIV testing was a significant predictor of HIV testing intention.

4.3.2.5   *Perceived barrier*

The in-depth interviews revealed a wide range of perceived barriers related to personal, interpersonal and social (friends, family and community) and service provision aspects.

Personal factors that were hindering people from getting tested include: fear of HIV positive result, lack of time and opportunity, fear of uncertainty of one's future if in case positive, the belief that one is not in relationship and fear of pain related to needle prick.

> *Because I was afraid and not ready to accept a positive result hence it was better for me not to get tested. I could get HIV testing services in the campus, in the street, and clinics. I have friends who were tested and they asked me to get tested but I declined and the good thing was all were negative. It was positive inspiration for me and I could also be negative too however I didn't use the opportunity. One of my fears not to get tested was that I may get positive result. The other fear is fear of needle injections and contamination. But now I am abandoning this reason."* A 23-years-old female student explained.

A number of factors related to peer, family and community were believed to be barriers not to get tested by in-depth interview participants. Some of in-depth interview participants believed that their peers are not supportive of their going for HIV counseling and testing. Some of the in-depth interview participants perceived that their peers would suspect about their HIV status, if they had told them about their plan to go for HCT and further believed that they didn't want to tell to anyone about their plan.

> *…I am wasting most of my time with my friends and for example, if I had told them about my plan to get tested, they would have suspected that I had some problem. And even if I had asked them to get tested, they would have assumed that I had some problem and they would have affected me psychologically."* A 19-years-old male in-depth interview participant explained.

However, for some of the in-depth interview participants, their peers had a positive influence in terms of motivating them and some of the participants would sought accompany from their peer to go to HCT facilities. For example, as singled out by a 23-years-old female student above. Likewise, a 20-years-old female student's perceived belief was in line with this as explained below:

> *…I believe that my friends would motivate me if I told them about getting tested for HIV.*

Similarly, some of the in-depth interview participants believed that their parents and family members would support and motivate them, if they intended to test for HIV.

There was no pressure on my side from whomever and you know I grew up as a fully free girl. And my mom usually advised us to get tested and we said to her what if we were HIV positive. She said no problem I would get treatment or managed my life style…In our family everybody tests regularly including my mother. I was close to my mom and she usually advises me and she said I were young and I had to use my time…And I was taking lessons from my mom and you know, you have to be courageous as you are young. A 20-years-old female student explained

In contrast, some of the in-depth interview participants believed that parents and family members might label them as promiscuous and they didn't want to tell about their plan for HCT to their parents and family members.

Most of the in-depth interview participants believe that there are great challenges from the side of the community. They believe that even though the attitude of stigma and discrimination for those with AIDS has been improving over the years, the participants believed that stigma and discrimination such as labeling one as promiscuous if she/he went for HCT and suspicion about one's HIV status are hindering factors.

In my home place in the rural community, people would believe that I had some suspicion if I were to go for HIV testing. You know things were difficult in rural areas. When people went for testing, the people would talk rumors as if I did some wrong thing and that is why I was not going for testing. Eighteen- years-old female student says.

Most of the in-depth interview participants were aware of where they could get HCT services. Many of them prefer HCT facilities with small crowds, small facilities, facilities with good counseling rooms, advanced facilities such as higher private clinics and hospitals, providers with advanced education background such as doctors and shorter waiting time.

If I am going to test, I prefer small facilities with small crowd where I can express my views freely. I really don't believe in the fact that health workers keep

secretes. I know they are told to do that but because they are human being and it differs from people to people. Even though they may not keep secretes, I believe that they can test it correctly as per their profession. Eighteen-years-old female student explains.

Some of the in-depth interview participants believed that they had concerns on confidentiality, cleanliness and quality of the services during especially campaign, and false positive results. For example, a 19-years-old male student explained his concerns on the truthfulness of HIV test result as follows:

I am hearing from mass media and others that the testing facilities have different capacities. If I am positive at one facility, the other facility may say I am negative. As I told you, HIV testing decides the fate of 50% of your life and if for example one facility tested me positive and this would affect my whole life. And your life would complicate and because it is difficult to revert this and because of this, I fear HIV testing.

The following issues were considered for the development of items for perceived barrier:

- Afraid of hearing HIV positive result
- Concerned with confidentiality at health facilities
- Afraid of the pain because of needle pricks
- Afraid of contamination during HIV testing procedures
- Doubts regarding the accuracy of HIV test results

4.3.2.6 Perceived self-efficacy

Many of the in-depth interview participants knew where they can get HIV testing, however they were not confident enough on how they were going to handle the whole process of HIV testing. The participants believe that they didn't know what they would do if they were HIV positive and indeed they would feel bad and sad about it.

If I want to go for HIV testing, I may go to church before my visit. If I am going to be negative, I will be happy and will be confident and will protect myself thereafter. If I am going to be positive, it will be difficult and I don't know what to do and I will be sad and God knows what I am going to do. A 20-years-old female student explained*.*

Few said that they would get prepared psychologically to accept any outcomes before HIV testing; they would look for standard testing facilities and would tell friends about their plan. However, some actually said they would pray before going for HCT.

I have to get prepared what I am going to do if I were going to be positive and also negative. After making the preparation, as I told you, laboratories differ in their capacity and I have to select clinics with good laboratory facilities and good standard clinic. And I will see my result and based on my result, the medical professional may provide me advice on what to do and I will take their advice if it is going to help me. If I am going to be negative, I will continue with my current behaviour. If I am going to be positive, I have to accept it and prevent others from being infected. I have to follow medical professional advice and I wanted to use my remaining life. A 19-years-old male student explained.

Some believe that they would seek advice from the counselor, would call to a free HIV information service for advice, would look for friend's and family's support, would care for oneself in terms of food and exercise, would disclose one' status and teach others, would seek for support from organisations, and would use life prolonging drugs if they were going to be HIV positive. A 24-years-male student explained his perceived self-efficacy as follows:

…I think if I am negative, I think this is also a burden on me. I should take maximum care. For the future, if I am negative, I will make sure that I have no relationship with positive people. If I am positive, I will not tell my family and that is impossible. May be if there are organisations that can offer me counseling, I will go to them and ask them for help. I also try to call 952 free telephone advices and call for advice. Other than that, I will read books that can improve my awareness on HIV/AIDS and live with care. Rarely if it goes out of my control, I may discuss with family and friends.

Some of the in-depth interview participants believe that they would not tell family and friends about their positive result, would be spiritual and would go to holy water, might commit suicide or believe that they would feel bad about their future plan and would lose hopes. A 21-years-old female student emphasises on the religious aspect.

> *…I think I will pray before testing. My big preparation is praying otherwise. I don't do anything. If things are good, that is okay and I will move forward. But if the unexpected happens, I will do what I told you before and because there is no medicine, I will incline to religion.*

Most of the in-depth interview participants would feel very happy and grateful if they had HIV free status and would be cautious in their future life experiences regarding protecting themselves from HIV/AIDS. It seems that most of the in-depth interview participants knew what they would do if they were free of HIV/AIDS and they were confident that they will more stick to desirable behaviours such as abstinence, faithfulness and use of condom.

The following ideas were considered for development of new items for perceived self-efficacy:

- Don't know what to do with positive results
- Tell friends about my plan about HIV testing
- Remaining faithful to one's partner after negative result
- Continue proper use of condom after negative result

4.3.2.7 Cues to action

In-depth interview participants who had ever tested for HIV in their life time believed that the following conditions had triggered their testing: HIV testing campaign, friends or family tested for HIV, girlfriend tested for HIV, information from medias, asked to donate blood for relatives, part of anti-AIDS club and advised by school and friends asks for accompany. The following quotes explain the various cues that triggered their HIV testing decision.

> *The first testing I done was just for fun. The second time I did, my friend told me that she wanted accompany and I have no problem. She was in different life style. During the third time, there is something that happened in my life and I have to escape from that thing."* A 21-years-old female student describes.

A male student explained:

> *The first thing that initiated me to test was that my friends were telling me about their HIV testing events and results. They were telling me that their HIV status was negative or positive. And they were asking me that 'are you worried about it?' I was replied them that I didn't suspect myself but I answered them that I might contract it through sharp materials and might feel bad. And also I was hearing from different min-medias that many Ethiopians were living with HIV/AIDS and I didn't know if I was one of them and, because of my friends, I intended to do HIV testing.*

A 22-year-old male student explains how HIV testing campaign initiated his testing as explained below:

> *As I told you, when you are living in campus, you are the one who decides your any aspect of your life. You can't go to here or there because someone told you to do or not to do so. And what I missed in my home town, I got it here in my campus where HIV testing tent was displayed for around 8 days. I just decided when I was passing by the HIV testing tent. I didn't have such good opportunity in the past.*

Some of the in-depth interview participants believed that they would test for HIV if they got a chance to travel abroad since it might be required as a condition to travel abroad.

The following ideas were considered for the development of new items under cues to action:

- Heard or seen information advising for HIV testing in the media
- HIV testing promotion and campaign in the campus
- Friends tested for HIV
- Asked to get tested to donate blood

4.4 CONCULUSION

In the current chapter, data management, analysis, presentation and interpretation of in-depth interview findings has been presented in great detail. In-depth interview data collected from 26 participants were transcribed and imported to OpenCode version 3.6.2.0 – qualitative data analysis software. Codes were assigned to phrases or a statement based on ideas from the six constructs of HBM; and lastly six categories were created based on HBM six constructs. The codes were populated under the six constructs. In the end, new issues for item writing were identified from the lists of codes categorised under each of the six constructs of the HBM. In summary, 23 items (3 items for perceived susceptibility, 2 items for perceived severity, 4 items for perceived benefit, 5 items for perceived barrier, 5 items for perceived self-efficacy and 4 items for cues to action) were formulated from the results of the in-depth interview. They were also incorporated in the item pool for the development of HTBS in the content validity assessment and finally in the pilot survey.

The next chapter deals with the data management, analysis, presentation and interpretation of the pilot survey to further refine the HTBS through item analysis and exploratory factor analysis (EFA). Chapter 5 is a core component of the HTBS development process, which was immediately followed after the content validity assessment by experts to refine the item pool as explained in Chapter 3.

CHAPTER 5

ANALYSIS, PRESENTATION AND DESCRIPTION OF THE FINDINGS OF THE PILOT SURVEY FOR THE DEVELOPMENT OF HTBS

5.1   INTRODUCTION

In Chapter 3, methodological issues related to the pilot survey that was intended to contribute for the development of the HTBS were discussed. After incorporating items from the in-depth interviews as described in Chapter 4, the HTBS was reviewed by experts and HTBS was finalised for further validation.

In this chapter data management, analysis, presentation and interpretation of findings from the pilot survey are presented in a systematic way. The chapter presents findings and interpretations of reliability assessment, exploratory factor analysis (EFA) and procedures for item retention and deletion. The chapter concludes with a summary of the final HTBS.

5.2   DATA MANAGEMENT AND ANALYSIS

Data entry and analysis were done using SPSS version 20. Data were entered for the 318 students that had completed the survey.

Data cleaning was done by running frequency distributions. Missing values and outliers were crosschecked with original hard copies of completed questionnaire and it has been confirmed with hard copies of HTBS that missing values were not filled by study subjects and outlier in terms of age was seen for one individual. The outlier value for age was left as it is.

Descriptive statistics (frequency distribution, item mean and SD) to inspect the dispersions and central tendencies of the items was performed.

Reliability tests (inter-item correlations, corrected item-to-total correlations, 'Cronbach's Alpha if Item Deleted' and Cronbach's Alpha for sub-scales) and Exploratory Factor Analysis (EFA) were performed.

The validity of the scale was assessed based on internal structure of the scale using Factor Analysis and item scale correlations. The exploratory factor analysis (principal axis factoring) was used to extract the factors. Kaiser-Mayer-Olkin (KMO) > 0.7 and Bartlett's tests for sphericity ($P < 0.05$) were considered for sampling adequacy for factor analysis. Factors with eigenvalue ≥ 1 were considered for initial factor extraction. Subsequent factor extractions were done based on pre-proposed number of factors based on HBM, using scree plot and numbers below and above these numbers to identify the best factor structure. The extracted factors were rotated using Oblique rotation (direct Oblimin). Oblique rotation was preferred over orthogonal because we expected some sort of correlations between factors in HBM in which case orthogonal rotation assumes that factors are not related (Costello & Osborne 2005; DeCoster 1998; Rummel 1970; Yong & Pearce 2013).

The Cronbach's alpha coefficient was performed to assess the internal consistency of the sub-scales (Constructs). Alpha coefficient value of 0.70 or above was considered as evidence of adequate reliability (internal consistency) for the sub-scale. Alpha value between 0.2-0.8 was accepted for inter-item and item-total correlations (Nunnally & Bernstein 1994).

5.3 RESULTS OF THE PILOTING SURVEY

5.3.1 Socio-demographic characteristics of the sample

The mean age of respondents was 21.3 years with standard deviation of 2.8 years. The majority of the respondents were male (75.7%). The characteristics of the students are shown in detail in Table 5.1.

Table 5.1:   Socio-demographic characteristics of respondents

Variables		Frequency	%
Gender	Male	237	75.7
	Female	76	24.3
	Total	313	100.0
Ethnicity	Oromo	59	18.8
	Amhara	138	44.1
	Tigrie	54	17.3
	Other	62	19.8
	Total	313	100.0
Religion	Orthodox	179	56.8
	Muslim	62	19.7
	Protestant	55	17.5
	Catholic	15	4.8
	Other	4	1.3
	Total	315	100.0
Marital status	Single	299	94.9
	Married	10	3.2
	Divorced	4	1.3
	Widowed	2	0.6
	Total	315	100.0
Class year	Year I	106	34.0
	Year II	51	16.3
	Year III	105	33.7
	Year IV or more	50	16.0
	Total	312	100.0
Place of Growth	Rural setting	119	38.6
	Urban setting	189	61.4
	Total	308	100.0

5.3.2 Reliability assessment and item analysis

Fifty-nine items representing the six constructs (perceived susceptibility=9, perceived severity=7, perceived benefit=7, perceived barrier=18, perceived self-efficacy=10 and cues to action=8) of HIV testing Belief Scale (HTBS) were included in the internal

consistency analysis. Five items dealing with HIV testing intention (dependent variable for the study) were also analysed for reliability.

As can be seen from Table 5.2, the mean values of all the items were less than 5 which was consistent with 3-5 points Likert scale. However, it seemed that the mean concentrate around the mid-point which indicate that respondents had a tendency of answering responses at the middle of the scale.

Table 5.2:   Statistics for the 59 items of HHBM scale

Items	Mean	Std. Deviation
I am afraid that I might contract HIV	3.4066	1.24801
I believe that there is a chance that I might be infected with HIV/AIDS in the next one year	2.4670	1.21068
I believe that I might get HIV even if I am having sex with only one partner	3.3187	1.09624
I believe that I might be infected with HIV if my sex partner is having unsafe sex with others	3.8571	1.06757
I believe that I might be infected with HIV even if I am using condom	3.5604	.98282
I believe that I am less susceptible to HIV because I have no HIV/AIDS related sign and symptoms	3.0385	1.15804
I believe that I am less susceptible to HIV/AIDS because I don't share sharp materials with other people	2.9780	1.16085
I am less concerned with HIV/AIDS because I don't have any sexual exposure	3.4176	1.23544
I don't consider myself to be at risk for HIV	2.6209	1.15830
I believe that HIV/AIDS is non-curable disease	3.8022	1.16789
If incase I am infected with HIV, I am afraid that HIV/AIDS could cause death to me	3.7198	1.15321
If incase I am infected with HIV, I am afraid that HIV/AIDS could cause disability to me	3.7637	.97153
If I am infected with HIV, I believe that HIV/AIDS could disrupt my family or social or economic activities	3.7418	.98290
If I am infected with HIV, I believe that it could cause psychological problem to me	3.7143	.95519
I would rather have any other terminal illness than AIDS	2.9835	1.12469
I would rather die from a violent death (e.g. gun shot, car accident, etc) than from AIDS	2.8407	1.28824
I believe that HIV testing will provide me the option to know my HIV status and get emotional relief	3.7692	.95855
I feel that HIV testing will help me plan to avoid infection in the future	3.9725	.87590
HIV testing provides me the option to get early treatment before getting seriously sick	3.9121	.79568
I believe that I can plan my future with full confidence through knowing my HIV status	3.8516	.85072
I believe that HIV testing would help me not to transmit HIV to others if incase I had HIV	3.8791	.87108

Items	Mean	Std. Deviation
I believe that HIV testing help me identify my sexual partner based on her/his HIV status	3.7692	.87415
I don't believe that knowing my HIV status could improve the effect of HIV/AIDS on my health	3.3956	1.28639
I am afraid of hearing HIV positive result by undergoing HIV testing	2.6593	1.13916
I am afraid of the stigma attached to HIV positive result	2.8571	1.12305
I am afraid of separation from my friends and families due to my HIV positive result	2.9560	1.10661
I don't want to wait long time at HIV testing facilities in order to have HIV testing	3.0275	1.08953
I am embarrassed to ask for HIV testing at HIV testing facilities	2.9121	1.09391
I am worried about confidentiality at HIV testing facilities	2.9890	1.06158
I am afraid that I may lose my partner if my HIV test result turned outto be positive	3.1923	1.06234
I don't want anyone to know that I'm sexually active/ at risk	2.9121	1.05797
I am afraid that people may talk about me if I go to a health facility for HIV testing	2.8516	1.09996
I have no doubts about HIV testing currently being offered	2.7418	1.06906
I am afraid that HIV testing procedure is painful because of needle pricks and other procedures	2.8187	1.19626
I am afraid blood and other contamination during HIV testing may happen to me	3.3681	1.10832
I know where I can get free HIV testing	2.2692	.96287
People will look down on me if I am HIV positive	3.2967	1.11241
I will not be accepted by the society if I am HIV positive	3.3297	1.07256
I may find out I am HIV positive	3.1813	1.10503
People who do the test may disclose my HIV test result to other people	3.2527	1.10342
I will have to wait for long time for the HIV test result	3.0714	1.06701
For me it would be easy to have HIV testing performed	3.5549	.89489
I am confident that I can convince my girl/boyfriend to go for HIV testing	3.5000	.86523
I am confident that I can deal with health workers who are providing HIV testing services in order to get tested	3.5220	.90856
I am confident that I can manage the physical pain and effects of HIV/AIDS from interfering with my daily life and future plans in case of positive result	3.3516	.95041
I am confident that I can manage the emotional disturbances caused by HIV positive result from interfering with my normal daily life and future plans in case of positive result	3.2637	1.00094
I am not confident that I will remain faithful with my partner after my negative HIV test result	3.3022	1.10843
I am not confident that I will use condoms properly and consistently to avoid future HIV risk after negative HIV test result	3.2143	1.06331
I am not confident that I will limit the number of sexual partners to avoid future HIV risk after HIV testing	3.3571	1.12182
I really don't know what I am going to do if I am going to be HIV positive	3.2637	1.06512
I cannot get HIV/AIDS treatment right away if I need it	3.2967	1.13210

Items	Mean	Std. Deviation
I recall seeing TV or billboards or posters or messages about the importance of HIV testing during the past one year	2.7857	.53930
During the past one year, I have received advice from a health professional about HIV testing	2.3791	.70059
During the past one year, I recall some form of HIV testing promotion in the campus	2.4945	.65433
My girlfriend/boyfriend usually thinks that it is good if I am tested for HIV	2.1923	.72168
My parents insisted that I should be tested for HIV	2.2527	.73722
I have friends who are tested for HIV	2.5934	.58486
I know people close to me who are ill with HIV/AIDS	2.3187	.73401
I was asked to get tested for HIV as a requirement to donate blood or to go to abroad or other circumstances	2.0769	.79683
I have ever thought about getting HIV testing	3.0444	1.2365
How likely are you in need of HIV counseling and testing service the next time you go for health care services?	3.1741	1.1647
How likely are you to accept HIV testing if you are requested to get tested for HIV the next time you go for health care services	3.2355	1.1598
How likely are you to get tested for HIV in the next three months?	2.9659	1.2017
How likely are you to do regular HIV testing in the future?	3.2014	1.2621

As can be seen from Table 5.3, the internal consistency (Cronbach's alpha) for each of the six subscales, fall in the range of 0.557-0.864. Perceived susceptibility and perceived severity had Cronbach's alpha values of 0.557 and 0.644 respectively which was below 0.70 and was not adequate. The rest of the constructs demonstrated Cronbach's alpha value of higher than 0.7.

Table 5.3: Total statistics for the six constructs of HBM and HIV testing intentions

Perceived susceptibility Items (Cronbach's Alpha=0.557)	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
I am afraid that I might contract HIV	25.5216	18.373	.420	.264	.471
I believe that there is a chance that I might be infected with HIV/AIDS in the next one year	26.6043	22.760	.039	.309	.590
I believe that I might get HIV even if I am having sex with only one partner	25.7014	20.405	.265	.325	.524
I believe that I might be infected with HIV if my sex partner is having unsafe sex with others	25.0540	20.730	.296	.323	.517
I believe that I might be infected with HIV even if I am using condom	25.4568	22.509	.099	.204	.568
I believe that I am less susceptible to HIV because I have no HIV/AIDS related sign and symptoms	25.8201	20.141	.287	.469	.517

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
I believe that I am less susceptible to HIV/AIDS because I don't share sharp materials with other people	25.8885	19.645	.338	.442	.501
I am less concerned with HIV/AIDS because I don't have any sexual exposure	25.4353	19.554	.340	.420	.500
I don't consider myself to be at risk for HIV	26.3741	20.914	.217	.252	.538
Perceived Severity Items (Cronbach's Alpha=0.644)					
I believe that HIV/AIDS is non-curable disease	20.67	15.963	.253	.179	.640
If incase I am infected with HIV, I am afraid that HIV/AIDS could cause death to me	20.64	15.337	.321	.320	.618
If incase I am infected with HIV, I am afraid that HIV/AIDS could cause disability to me	20.62	15.016	.479	.375	.574
If I am infected with HIV, I believe that HIV/AIDS could disrupt my family or social or economic activities	20.74	14.539	.522	.479	.559
If I am infected with HIV, I believe that it could cause psychological problem to me	20.77	14.691	.511	.465	.563
I would rather have any other terminal illness than AIDS	21.66	15.785	.297	.359	.625
I would rather die from a violent death (e.g. gun shot, car accident, etc) than from AIDS	21.71	16.088	.187	.331	.666
Perceived Benefit Items (Cronbach's Alpha=0.769)	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
I believe that HIV testing will provide me the option to know my HIV status and get emotional relief	22.9759	15.027	.548	.441	.728
I feel that HIV testing will help me plan to avoid infection in the future	22.7690	14.933	.636	.533	.712
HIV testing provides me the option to get early treatment before getting seriously sick	22.8034	15.529	.627	.443	.718
I believe that I can plan my future with full confidence through knowing my HIV status	22.8621	15.067	.620	.459	.715
I believe that HIV testing would help me not to transmit HIV to others if incase I had HIV	22.8379	15.693	.519	.365	.735
I believe that HIV testing help me identify my sexual partner based on her/his HIV status	23.0207	16.332	.389	.261	.761
I don't believe that knowing my HIV status could improve the effect of HIV/AIDS on my health	23.1586	16.265	.238	.100	.810
Perceived barrier (Cronbach's Alpha=0.864)					
I am afraid of hearing HIV positive result by undergoing HIV testing	49.5535	115.892	.590	.510	.852
I am afraid of the stigma attached to HIV positive result	49.3875	113.979	.684	.660	.848
I am afraid of separation from my friends and families due to my HIV positive result	49.2030	116.481	.586	.548	.853
I don't want to wait long time at HIV testing facilities in order to have HIV testing	49.1697	117.401	.543	.421	.854
I am embarrassed to ask for HIV testing at HIV testing facilities	49.3579	115.045	.652	.539	.850
I am worried about confidentiality at HIV testing facilities	49.1845	118.255	.532	.437	.855
I am afraid that I may lose my partner if my HIV test result turned out to be positive	48.9889	118.596	.484	.379	.857

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
I don't want anyone to know that I'm sexually active/ at risk	49.3469	114.250	.673	.635	.849
I am afraid that people may talk about me if I go to a health facility for HIV testing	49.3579	114.631	.653	.628	.850
I have no doubts about HIV testing currently being offered	49.2841	130.989	.010	.232	.875
I am afraid that HIV testing procedure is painful because of needle pricks and other procedures	49.4244	121.741	.335	.350	.863
I am afraid blood and other contamination during HIV testing may happen to me	48.8598	123.084	.298	.268	.865
I know where I can get free HIV testing	49.8413	131.971	-.021	.257	.874
People will look down on me if I am HIV positive	48.8819	117.245	.536	.706	.855
I will not be accepted by the society if I am HIV positive	48.8229	118.872	.486	.680	.857
I may find out I am HIV positive	49.0221	118.059	.507	.487	.856
People who do the test may disclose my HIV test result to other people	48.9262	118.780	.470	.441	.857
I will have to wait for long time for the HIV test result	49.0812	118.808	.498	.358	.856
Perceived self- efficacy Items (Cronbach's Alpha=0.705)	**Scale Mean if Item Deleted**	**Scale Variance if Item Deleted**	**Corrected Item-Total Correlation**	**Squared Multiple Correlation**	**Cronbach's Alpha if Item Deleted**
For me it would be easy to have HIV testing performed	30.2924	26.200	.433	.468	.673
I am confident that I can convince my girl/boyfriend to go for HIV testing	30.3791	26.714	.376	.463	.681
I am confident that I can deal with health workers who are providing HIV testing services in order to get tested	30.3502	26.533	.377	.306	.681
I am confident that I can manage the physical pain and effects of HIV/AIDS from interfering with my daily life and future plans in case of positive result	30.5704	27.159	.291	.563	.695
I am confident that I can manage the emotional disturbances caused by HIV positive result from interfering with my normal daily life and future plans in case of positive result	30.6318	29.009	.116	.511	.722
I am not confident that I will remain faithful with my partner after my negative HIV test result	30.5560	26.545	.291	.469	.697
I am not confident that I will use condoms properly and consistently to avoid future HIV risk after negative HIV test result	30.5776	25.020	.457	.426	.666
I am not confident that I will limit the number of sexual partners to avoid future HIV risk after HIV testing	30.5126	24.258	.499	.473	.657
I really don't know what I am going to do if I am going to be HIV positive	30.6318	25.755	.393	.350	.678
I cannot get HIV/AIDS treatment right away if I need it	30.5560	25.277	.419	.390	.673
Cues to action Items (Cronbach's Alpha=0.732)					
I recall seeing TV or billboards or posters or messages about the importance of HIV testing during the past one year	16.0531	10.132	.199	.121	.743

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
During the past one year, I have received advice from a health professional about HIV testing	16.4163	8.613	.512	.309	.688
During the past one year, I recall some form of HIV testing promotion in the campus	16.3061	9.369	.345	.185	.720
My girlfriend/boyfriend usually thinks that it is good if I am tested for HIV	16.6571	8.366	.533	.415	.682
My parents insisted that I should be tested for HIV	16.6163	8.475	.491	.339	.691
I have friends who are tested for HIV	16.2122	9.824	.268	.171	.732
I know people close to me who are ill with HIV/AIDS	16.4816	8.595	.474	.322	.695
I was asked to get tested for HIV as a requirement to donate blood or to go to abroad or other circumstances	16.8000	8.046	.545	.365	.678
HIV testing Intention Items (Cronbach's Alpha=0.888)	**Scale Mean if Item Deleted**	**Scale Variance if Item Deleted**	**Corrected Item-Total Correlation**	**Squared Multiple Correlation**	**Cronbach's Alpha if Item Deleted**
I have ever thought about getting HIV testing	12.58	17.457	.588	.382	.895
How likely are you in need of HIV counseling and testing service the next time you go for health care services?	12.45	16.317	.786	.628	.850
How likely are you to accept HIV testing if you are requested to get tested for HIV the next time you go for health care services	12.39	16.560	.759	.596	.856
How likely are you to get tested for HIV in the next three months?	12.66	15.932	.801	.655	.846
How likely are you to do regular HIV testing in the future?	12.42	16.196	.716	.577	.866

Further removals of weak items were made based on 'Corrected Item-Total Correlation' and 'Cronbach's Alpha if Item Deleted' to improve the Cronbach's alpha value of each of the constructs. Items with low 'Corrected Item-Total Correlation' value were removed if the removal was going to improve the Cronbach's alpha value. As it can be seen in the below table, removal of the first five items from the perceived susceptibility construct improved the Cronbach's alpha value from 0.557 to 0.758. Removal of two items from the perceived severity construct improved the Cronbach's alpha value from 0.644 to 0.715. Removal of one item from the perceived benefit construct improved the Cronbach's alpha value from 0.769 to 0.807. Removal of four items from perceived barrier improved the Cronbach's alpha value from 0.864 to 0.887. Removal of one item from the perceived self-efficacy improved the Cronbach's alpha value from 0.705 to 0.732. Removal of two items from the cues to action construct improved the Cronbach's alpha value from 0.732 to 0.745. No item was removed from the HIV testing intention construct. Further discussion on deletion and retention of items was addressed in the latter section was dealt with under EFA for all the constructs.

Table 5.4: Total statistics after removal of items

Perceived susceptibility Items (Cronbach's Alpha=0.758)	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correla-tion	Squared Multiple Correla-tion	Cronbach's Alpha if Item Deleted
I believe that I am less susceptible to HIV because I have no HIV/AIDS related sign and symptoms	9.2408	7.996	.603	.436	.674
I believe that I am less susceptible to HIV/AIDS because I don't share sharp materials with other people	9.3110	7.772	.658	.446	.644
I am less concerned with HIV/AIDS because I don't have any sexual exposure	8.8629	7.991	.606	.393	.673
I don't consider myself to be at risk for HIV	9.8395	9.538	.370	.160	.795
Perceived Severity Items (Cronbach's Alpha=0.715)					
I believe that HIV/AIDS is non-curable disease	15.08	9.776	.350	.168	.721
If incase I am infected with HIV, I am afraid that HIV/AIDS could cause death to me	15.04	9.123	.457	.316	.676
If incase I am infected with HIV, I am afraid that HIV/AIDS could cause disability to me	15.03	9.268	.578	.376	.629
If I am infected with HIV, I believe that HIV/AIDS could disrupt my family or social or economic activities	15.15	9.420	.514	.467	.652
If I am infected with HIV, I believe that it could cause psychological problem to me	15.18	9.593	.498	.449	.659
Perceived Benefit (Cronbach's Alpha=0.807)	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
I believe that HIV testing will provide me the option to know my HIV status and get emotional relief	19.38	11.582	.529	.441	.786
I feel that HIV testing will help me plan to avoid infection in the future	19.18	11.435	.636	.535	.761
HIV testing provides me the option to get early treatment before getting seriously sick	19.20	11.988	.626	.414	.765
I believe that I can plan my future with full confidence through knowing my HIV status	19.27	11.323	.654	.451	.756
I believe that HIV testing would help me not to transmit HIV to others if incase I had HIV	19.24	12.018	.536	.360	.783
I believe that HIV testing help me identify my sexual partner based on her/his HIV status	19.42	12.368	.434	.235	.807
Perceived Barrier (Cronbach's Alpha=0.887)					
I am afraid of hearing HIV positive result by undergoing HIV testing	41.17	105.344	.591	.501	.878
I am afraid of the stigma attached to HIV positive result	41.01	103.590	.687	.658	.874
I am afraid of separation from my friends and families due to my HIV positive result	40.84	105.652	.598	.528	.878
I don't want to wait long time at HIV testing facilities in order to have HIV testing	40.79	106.883	.539	.411	.881
I am embarrassed to ask for HIV testing at HIV testing facilities	40.99	104.674	.649	.517	.876
I am worried about confidentiality at HIV testing facilities	40.80	107.877	.523	.416	.881

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
I am afraid that I may lose my partner if my HIV test result turned out to be positive	40.59	107.620	.504	.341	.882
I don't want anyone to know that I'm sexually active/ at risk	40.97	103.442	.693	.634	.874
I am afraid that people may talk about me if I go to a health facility for HIV testing	40.99	103.590	.686	.612	.874
I am afraid that HIV testing procedure is painful because of needle pricks and other procedures	41.05	109.898	.382	.258	.888
People will look down on me if I am HIV positive	40.49	107.159	.523	.690	.881
I will not be accepted by the society if I am HIV positive	40.43	108.685	.472	.672	.883
I may find out I am HIV positive	40.64	107.353	.513	.475	.882
People who do the test may disclose my HIV test result to other people	40.54	108.791	.445	.431	.885
I will have to wait for long time for the HIV test result	40.72	108.681	.477	.344	.883
Perceived self- efficacy Items (Cronbach's Alpha=0.732)	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
For me it would be easy to have HIV testing performed	27.0996	25.069	.409	.478	.709
I am confident that I can convince my girl/boyfriend to go for HIV testing	27.1851	25.666	.342	.471	.719
I am confident that I can deal with health workers who are providing HIV testing services in order to get tested	27.1601	25.399	.355	.310	.717
I am confident that I can manage the physical pain and effects of HIV/AIDS from interfering with my daily life and future plans in case of positive result	27.3808	27.308	.145	.319	.750
I am not confident that I will remain faithful with my partner after my negative HIV test result	27.3559	23.980	.403	.455	.710
I am not confident that I will use condoms properly and consistently to avoid future HIV risk after negative HIV test result	27.3808	23.015	.528	.437	.686
I am not confident that I will limit the number of sexual partners to avoid future HIV risk after HIV testing	27.3167	22.403	.556	.480	.680
I really don't know what I am going to do if I am going to be HIV positive	27.4306	23.975	.439	.357	.703
I cannot get HIV/AIDS treatment right away if I need it	27.3559	23.287	.487	.390	.694
Cues to action Items (Cronbach's Alpha=0.745)					
During the past one year, I have received advice from a health professional about HIV testing	8.97	6.477	.508	.292	.702
During the past one year, I recall some form of HIV testing promotion in the campus	9.07	7.189	.335	.162	.745
My girlfriend/boyfriend usually thinks that it is good if I am tested for HIV	8.76	6.154	.583	.381	.680
My parents insisted that I should be tested for HIV	8.79	6.306	.521	.321	.697
I know people close to me who are ill with HIV/AIDS	8.93	6.703	.422	.208	.725
I was asked to get tested for HIV as a requirement to donate blood or to go to abroad or other circumstances	8.63	6.140	.525	.300	.696

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5.3.3 Exploratory factor analysis

A common factor analysis method, such as principal axis factoring and maximum likelihood, are recommended if the purpose is scale development whereas principal component analysis is recommended if the purpose is data reduction (Roberson, Elliott, Chang & Hill 2014).

EFA assumes that observable items can be reduced to a manageable number of categories (factors) that share a common variance, which is also called reducing dimensionality (Bartholomew, Knott & Moustaki 2011).

According to Netemeyer, Bearden and Sharma (2003), EFA is used for two major purposes in scale development:

(1)   to reduce the number of items (variables) in a scale so that the remaining items maximise the explained variance in the scale and maximise the scale's reliability
(2)   to identify potential underlying dimensions (factors) in a scale. In the current analysis, the main purpose of EFA was to reduce the number of items to more reliable and valid HTBS

Fifty-nine items, representing the six constructs of HBM, were considered for the analysis. Twelve items which were worded negatively were recoded into the reverse Likert scale format so that the item values would be in the same formats. This had ensured that higher values indicate strong intensity of the constructs and lower values indicate low intensity related to the construct.

The basic requirements for EFA were met. The items in the scale were measured on a Likert Scale of more than three responses (five- point Likert scale for all the constructs except for cues to action which had three-point Likert scale). The sample size of 318 was greater than that recommended by Tabachnick and Fidell (2001). Cases with missing values were deleted to prevent overestimation (Tabachnick & Fidell 2007).

Preliminary assessment of the data was done to determine the adequacy of the sample size for EFA. The Kaiser-Myer-Olkin (KMO) value is 0.714 which is greater than 7.0

indicating that the data are factorable and Bartlett's test of sphericity was significant at the value of (chi-square=5860.7) 0.000 showing that sample size was adequate.

Item communalities are considered to be high, when all items are >0.80, which is unlikely to occur in reality (Velicer & Fava 1998). However, as per Costello and Osborne (2005), low to moderate communalities of 0.40-0.70 are the norm in the field of social sciences. As can be seen from Table 5.5, the communalities after extraction for most of the item was>0.40 except for one item ("I recall seeing TV or billboards or posters or messages about the importance of HIV testing during the past one year"). Decisions whether to drop this item was made in the latter section of this chapter. The presence of strong communalities can suggest the presence of strong data for EFA.

Table 5.5:   Communalities for 59 items of HTBS

Item	Initial	Extraction
I am afraid that I might contract HIV	.628	.488
I believe that there is a chance that I might be infected with HIV/AIDS in the next one year	.660	.587
I believe that I might get HIV even if I am having sex with only one partner	.668	.653
I believe that I might be infected with HIV if my sex partner is having unsafe sex with others	.694	.681
I believe that I might be infected with HIV even if I am using condom	.552	.520
I believe that I am less susceptible to HIV because I have no HIV/AIDS related sign and symptoms	.683	.634
I believe that I am less susceptible to HIV/AIDS because I don't share sharp materials with other people	.713	.654
I am less concerned with HIV/AIDS because I don't have any sexual exposure	.733	.736
I don't consider myself to be at risk for HIV	.590	.484
I believe that HIV/AIDS is non-curable disease	.624	.548
If incase I am infected with HIV, I am afraid that HIV/AIDS could cause death to me	.649	.656
If incase I am infected with HIV, I am afraid that HIV/AIDS could cause disability to me	.610	.588
If I am infected with HIV, I believe that HIV/AIDS could disrupt my family or social or economic activities	.658	.677
If I am infected with HIV, I believe that it could cause psychological problem to me	.683	.724
I would rather have any other terminal illness than AIDS	.660	.564
I would rather die from a violent death (e.g. gun shot, car accident, etc) than from AIDS	.657	.599
I believe that HIV testing will provide me the option to know my HIV status and get emotional relief	.657	.687
I feel that HIV testing will help me plan to avoid infection in the future	.731	.727
HIV testing provides me the option to get early treatment before getting seriously sick	.673	.646
I believe that I can plan my future with full confidence through knowing my HIV status	.668	.616
I believe that HIV testing would help me not to transmit HIV to others if incase I had HIV	.647	.635

Item	Initial	Extraction
I believe that HIV testing help me identify my sexual partner based on her/his HIV status	.605	.525
I don't believe that knowing my HIV status could improve the effect of HIV/AIDS on my health	.700	.635
I am afraid of hearing HIV positive result by undergoing HIV testing	.722	.621
I am afraid of the stigma attached to HIV positive result	.818	.743
I am afraid of separation from my friends and families due to my HIV positive result	.739	.673
I don't want to wait long time at HIV testing facilities in order to have HIV testing	.667	.647
I am embarrassed to ask for HIV testing at HIV testing facilities	.650	.530
I am worried about confidentiality at HIV testing facilities	.680	.559
I am afraid that I may lose my partner if my HIV test result turned out to be positive	.536	.440
I don't want anyone to know that I'm sexually active/ at risk	.771	.726
I am afraid that people may talk about me if I go to a health facility for HIV testing	.720	.663
I have no doubts about HIV testing currently being offered	.516	.513
I am afraid that HIV testing procedure is painful because of needle pricks and other procedures	.576	.517
I am afraid blood and other contamination during HIV testing may happen to me	.549	.554
I know where I can get free HIV testing	.559	.480
People will look down on me if I am HIV positive	.836	.835
I will not be accepted by the society if I am HIV positive	.819	.793
I may find out I am HIV positive	.574	.497
People who do the test may disclose my HIV test result to other people	.643	.554
I will have to wait for long time for the HIV test result	.638	.564
For me it would be easy to have HIV testing performed	.745	.849
I am confident that I can convince my girl/boyfriend to go for HIV testing	.676	.645
I am confident that I can deal with health workers who are providing HIV testing services in order to get tested	.517	.445
I am confident that I can manage the physical pain and effects of HIV/AIDS from interfering with my daily life and future plans in case of positive result	.749	.727
I am confident that I can manage the emotional disturbances caused by HIV positive result from interfering with my normal daily life and future plans in case of positive result	.787	.850
I am not confident that I will remain faithful with my partner after my negative HIV test result	.739	.719
I am not confident that I will use condoms properly and consistently to avoid future HIV risk after negative HIV test result	.635	.513
I am not confident that I will limit the number of sexual partners to avoid future HIV risk after HIV testing	.677	.547
I really don't know what I am going to do if I am going to be HIV positive	.699	.651
I cannot get HIV/AIDS treatment right away if I need it	.700	.676
I recall seeing TV or billboards or posters or messages about the importance of HIV testing during the past one year	.460	.259
During the past one year, I have received advice from a health professional about HIV testing	.601	.572
During the past one year, I recall some form of HIV testing promotion in the campus	.592	.527
My girlfriend/boyfriend usually thinks that it is good if I am tested for HIV	.673	.705
My parents insisted that I should be tested for HIV	.558	.471

Item	Initial	Extraction
I have friends who are tested for HIV	.489	.448
I know people close to me who are ill with HIV/AIDS	.609	.561
I was asked to get tested for HIV as a requirement to donate blood or to go to abroad or other circumstances	.614	.561

A factor loading for a variable or an item is a measure of how much the variable or the item contributes to the factor (a regression coefficients between items and factors); thus, high factor loading scores indicate that the dimensions of the factors are better accounted for by the variables (Norris & Lecavalier 2010; Tabachnick & Fidell 2007).

There is no clear guideline as to what level of factor loading to be considered for retaining items in EFA. Comrey and Lee (1992) recommend selecting items with factor loading of 0.3 or more. However, Pett, Lackey and Sullivan (2003) recommend a factor loading of 0.4 or more. For this study a factor loading of 0.4 or more was used for selecting items and running EFA to be on the side of more conservativeness.

During the initial EFA, among 59 items suggested for the HTBS, 22 items showed either low factor loading of <0.40 or cross-loading on EFA analysis or wrongly loading on inappropriate factor set at 6 factors (Table 5.6). For this scale (Table 5.6), most of the items (36 out of 59) were strong loaders with factor loading >0.50. High factor loading could also be a sign of strong data for EFA.

According to Costello and Osborne (2005) and Thompson (2004), a factor with fewer than three items is generally weak and unstable and suggests that five or more strongly loading items (0.50 or better) are needed and indicates a solid factor. As can be seen in Table 5.6, three factors (1, 2 & 4) demonstrated this clearly. The remaining three factors (3, 5 & 6) met the criteria of minimum three items (Tabachnick & Fidell 2007).

Principal axis factoring (PAF), a type of factor analysis, was used to extract factors for a total of 59 items. PAF was preferred over maximum likelihood method because the assumption of normality was not maintained in the data (Fabrigar, Wegener, MacCallum & Strahan 1999).

Oblique rotation (Direct Oblimin) analysis was used to rotate the factors so that it would be easier to interpret their underlying meanings. This facilitated ordering of the items by

the value of their factor loading. Items with factor loading below 0.4 were suppressed. An item was considered to be cross-loading when the values of factor loadings is greater than 0.40 and differ from each other by less than 0.2 (Di lorio 2005). The decision to retain one of the items was made based on the value of factor loading and best conceptual relevance. Items with factor loading of less than 0.4 on all factors were deleted.

Initial extraction analysis identified 12 factors with Eigenvalues greater than 1 which were ranging from 1.021 to 8.935 and the 12 factors explained 54.5% of the variance. Because Kaiser-Guttmanrule (Guttman 1954; Kaiser 1960) can usually underestimate or overestimate the number of factors to retain, further analysis was done regarding this. However, the scree plot which was proposed by Cattell (1966) indicated that there were10 factors (Figure 5-1).
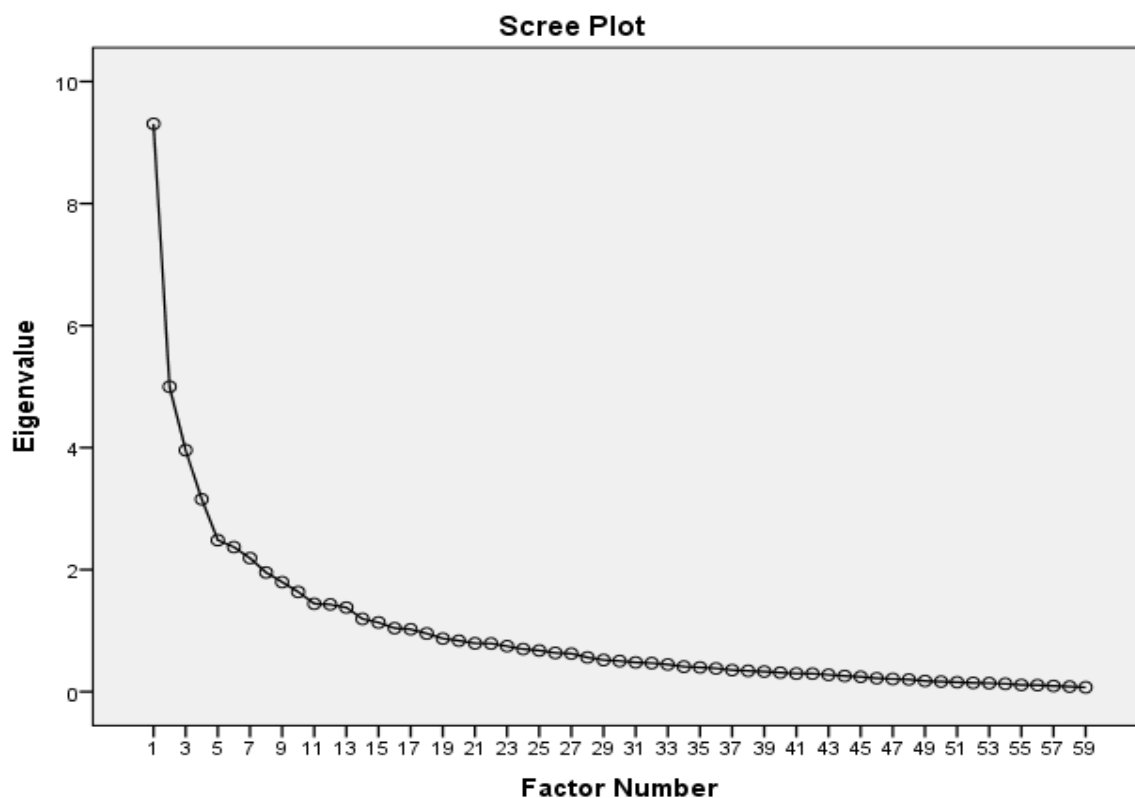
Figure 5.1:   Scree plot for six factors EFA using PAF

Table 5.6: Structure matrix for exploratory factor analysis using PAF

Item	Factor 1	2	3	4	5	6
I am afraid of the stigma attached to HIV positive result	.774					
I don't want anyone to know that I'm sexually active/ at risk	.699					
I am afraid of hearing HIV positive result by undergoing HIV testing	.699					
I am afraid of separation from my friends and families due to my HIV positive result	.662					
I am afraid that people may talk about me if I go to a health facility for HIV testing	.655					
I am embarrassed to ask for HIV testing at HIV testing facilities	.654					
I don't want to wait long time at HIV testing facilities in order to have HIV testing	.639					
I am not confident that I will remain faithful with my partner after my negative HIV test result	-.629					
I am worried about confidentiality at HIV testing facilities	.579					
I cannot get HIV/AIDS treatment right away if I need it	-.552					
I will have to wait for long time for the HIV test result	.532					
I am not confident that I will limit the number of sexual partners to avoid future HIV risk after HIV testing	-.506					
I don't believe that knowing my HIV status could improve the effect of HIV/AIDS on my health	-.503			.404		
I am afraid that I may lose my partner if my HIV test result turned out to be positive	.502					
I really don't know what I am going to do if I am going to be HIV positive	-.465					
I would rather die from a violent death (e.g. gun shot, car accident, etc) than from AIDS	.424					
I believe that there is a chance that I might be infected with HIV/AIDS in the next one year	.423					
I am not confident that I will use condoms properly and consistently to avoid future HIV risk after negative HIV test result	-.407					
I am afraid that HIV testing procedure is painful because of needle pricks and other procedures						
I feel that HIV testing will help me plan to avoid infection in the future		.712				
HIV testing provides me the option to get early treatment before getting seriously sick		.674				
I believe that I can plan my future with full confidence through knowing my HIV status		.673				
I believe that HIV testing will provide me the option to know my HIV status and get emotional relief		.541				
I believe that HIV testing would help me not to transmit HIV to others if incase I had HIV		.533				
I am afraid that I might contract HIV		.519				
I am less concerned with HIV/AIDS because I don't have any sexual exposure		.511				
I believe that HIV testing help me identify my sexual partner based on her/his HIV status		.436				
I believe that I am less susceptible to HIV because I have no HIV/AIDS related sign and symptoms		.420	.402			

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Item	Factor					
	1	2	3	4	5	6
I believe that HIV/AIDS is non-curable disease						
I have friends who are tested for HIV						
I am confident that I can manage the physical pain and effects of HIV/AIDS from interfering with my daily life and future plans in case of positive result			-.694			
I am confident that I can manage the emotional disturbances caused by HIV positive result from interfering with my normal daily life and future plans in case of positive result			-.630			
I am confident that I can convince my girl/boyfriend to go for HIV testing			-.609			
For me it would be easy to have HIV testing performed			-.607			
I believe that I am less susceptible to HIV/AIDS because I don't share sharp materials with other people			.436			
I am confident that I can deal with health workers who are providing HIV testing services in order to get tested			-.408			
I believe that I might get HIV even if I am having sex with only one partner			-.400			
I believe that I might be infected with HIV if my sex partner is having unsafe sex with others						
I don't consider myself to be at risk for HIV						
I have no doubts about HIV testing currently being offered						
My girlfriend/boyfriend usually thinks that it is good if I am tested for HIV				-.679		
I was asked to get tested for HIV as a requirement to donate blood or to go to abroad or other circumstances				-.646		
During the past one year, I have received advice from a health professional about HIV testing				-.621		
My parents insisted that I should be tested for HIV				-.602		
I know people close to me who are ill with HIV/AIDS				-.548		
If in case I am infected with HIV, I am afraid that HIV/AIDS could cause death to me				.465		
During the past one year, I recall some form of HIV testing promotion in the campus						
If I am infected with HIV, I believe that it could cause psychological problem to me					.674	
If I am infected with HIV, I believe that HIV/AIDS could disrupt my family or social or economic activities					.664	
If incase I am infected with HIV, I am afraid that HIV/AIDS could cause disability to me					.610	
I would rather have any other terminal illness than AIDS					.445	
People will look down on me if I am HIV positive						-.760
I will not be accepted by the society if I am HIV positive						-.745
I may find out I am HIV positive						-.515
I know where I can get free HIV testing						.464
I am afraid blood and other contamination during HIV testing may happen to me						-.407
People who do the test may disclose my HIV test result to other people						-.402
I believe that I might be infected with HIV even if I am using condom						

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Item	Factor					
	1	2	3	4	5	6
I recall seeing TV or billboards or posters or messages about the importance of HIV testing during the past one year						

Extraction Method: Principal Axis Factoring.

Rotation Method: Oblimin with Kaiser Normalization.

On the other hand, the proposed factors (components) in the health belief model which were included in this study were six.

In order to resolve the above varying number of factors and decide the best number of factors, Costello and Osborne (2005) suggest to run multiple factor analysis by setting the number of factors: once at the projected number based on a priori (proposed) factor structure; again at the number of factors suggested by the scree test if it is different from the predicted number; and then at numbers above and below the number of factors pre-determined by the HBM and scree plot.

In this study, six factors were proposed based on the constructs of the HBM; and 10 factors were identified through scree plot test. Accordingly, eight EFAs (setting the number of factors once at five, six, seven, eight, nine, ten, eleven and twelve) were run one after the other starting from the highest i.e. 12 to 5 until clear factor structure and strong loading were obtained.

Matsunaga (2010) suggests that if the true nature of the constructs is well known, the number of latent factors should be determined primarily based on theoretical and conceptual nature of the constructs. Corroborating this, Clark & Watson (1995) also argue that there is no substitute for a good theory and careful thought when using factor analysis.

Since the items were developed based on HBM which contained six factors, the structure matrix set at greater than six factors could not fit the aim of the study and EFA indicated these analyses resulted in many factors with a lot of cross loading and weak factor loading.

EFA after setting the number of factors at six resulted in removal of 23 items based on low factor loading (<0.40) and cross loading which was depicted in the structure matrix shown in Table 5.7. In total, the 6 factors accounted for 47.6% of the total variance in the data set.

However, three items (efficacy 6 & 10 and severity2) loaded under wrong factors as opposed to the rest items a depicted in Table 5.7. Moreover, items which were written for perceived barrier loaded under two different factors (1 & 5) as if the items were showing two different factors.

Table 5.7: Structure matrix for exploratory factor analysis using PAF after removal of 23 items

Item	Factor					
	1	2	3	4	5	6
Barrier2 I am afraid of the stigma attached to HIV positive result	.787					
Barrier8 I don't want anyone to know that I'm sexually active/ at risk	.741					
Barrier9 I am afraid that people may talk about me if I go to a health facility for HIV testing	.705					
Barrier5 I am embarrassed to ask for HIV testing at HIV testing facilities	.698					
Barrier1 I am afraid of hearing HIV positive result by undergoing HIV testing	.671					
Barrier3 I am afraid of separation from my friends and families due to my HIV positive result	.670					
Barrier4 I don't want to wait long time at HIV testing facilities in order to have HIV testing	.639					
Barrier7 I am afraid that I may lose my partner if my HIV test result turned outto be positive	.602					
Barrier6 I am worried about confidentiality at HIV testing facilities	.591					
Efficacy6_N I am not confident that I will remain faithful with my partner after my negative HIV test result	-.512					
Efficacy10_N I cannot get HIV/AIDS treatment right away if I need it	-.486					
Benefit4 I believe that I can plan my future with full confidence through knowing my HIV status		.768				
Benefit3 HIV testing provides me the option to get early treatment before getting seriously sick		.763				
Benefit2 I feel that HIV testing will help me plan to avoid infection in the future		.723				
Benefit5 I believe that HIV testing would help me not to transmit HIV to others if incase I had HIV		.659				
Benefit1 I believe that HIV testing will provide me the option to know my HIV status and get emotional relief		.581				
Benefit6 I believe that HIV testing help me identify my sexual partner based on her/his HIV status		.544				

Item	Factor					
	1	2	3	4	5	6
Efficacy4 I am confident that I can manage the physical pain and effects of HIV/AIDS from interfering with my daily life and future plans in case of positive result			-.770			
Efficacy2 I am confident that I can convince my girl/boyfriend to go for HIV testing			-.687			
Efficacy5 I am confident that I can manage the emotional disturbances caused by HIV positive result from interfering with my normal daily life and future plans in case of positive result			-.671			
Efficacy1 For me it would be easy to have HIV testing performed			-.657			
Efficacy3 I am confident that I can deal with health workers who are providing HIV testing services in order to get tested			-.560			
Cues4_N My girlfriend/boyfriend usually thinks that it is good if I am tested for HIV				.705		
Cues8_N I was asked to get tested for HIV as a requirement to donate blood or to go to abroad or other circumstances				.648		
Cues5_N My parents insisted that I should be tested for HIV				.639		
Cues2_N During the past one year, I have received advice from a health professional about HIV testing				.582		
Cues7_N I know people close to me who are ill with HIV/AIDS				.531		
Severity2 If incase I am infected with HIV, I am afraid that HIV/AIDS could cause death to me				-.428		
Barrier14 People will look down on me if I am HIV positive					-.844	
Barrier15 I will not be accepted by the society if I am HIV positive					-.829	
Barrier16 I may find out I am HIV positive					-.697	
Barrier17 People who do the test may disclose my HIV test result to other people					-.584	
Barrier12 I am afraid blood and other contamination during HIV testing may happen to me					-.446	
Severity4 If I am infected with HIV, I believe that HIV/AIDS could disrupt my family or social or economic activities						.727
Severity5 If I am infected with HIV, I believe that it could cause psychological problem to me						.696
Severity3 If incase I am infected with HIV, I am afraid that HIV/AIDS could cause disability to me						.668

Extraction Method: Principal Axis Factoring.

Rotation Method: Oblimin with Kaiser Normalization.

In order to resolve these problems, the factor was set at five and some of the items with a factor loading of <0.50 was removed and EFA was run once again. As indicated in Table 5.8, even though the matrix structure was not perfectly consistent with HBM, it then demonstrated a clear structure with very strong three or more items which had a factor loading of >0.50. At that point the five factors accounted for 48.1% of the variance in the data.

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Table 5.8: Structure matrix for exploratory factor analysis using PAF set at five factors

Item	Factor				
	1	**2**	**3**	**4**	**5**
Barrier2 I am afraid of the stigma attached to HIV positive result	.810				
Barrier8 I don't want anyone to know that I'm sexually active/ at risk	.726				
Barrier9 I am afraid that people may talk about me if I go to a health facility for HIV testing	.712				
Barrier5 I am embarrassed to ask for HIV testing at HIV testing facilities	.701				
Barrier3 I am afraid of separation from my friends and families due to my HIV positive result	.694				
Barrier1 I am afraid of hearing HIV positive result by undergoing HIV testing	.670				
Barrier4 I don't want to wait long time at HIV testing facilities in order to have HIV testing	.653				
Barrier7 I am afraid that I may lose my partner if my HIV test result turned outto be positive	.612				
Barrier6 I am worried about confidentiality at HIV testing facilities	.571				
Benefit3 HIV testing provides me the option to get early treatment before getting seriously sick		.766			
Benefit2 I feel that HIV testing will help me plan to avoid infection in the future		.734			
Benefit4 I believe that I can plan my future with full confidence through knowing my HIV status		.734			
Benefit5 I believe that HIV testing would help me not to transmit HIV to others if incase I had HIV		.608			
Benefit1 I believe that HIV testing will provide me the option to know my HIV status and get emotional relief		.595			
Cues4 My girlfriend/boyfriend usually thinks that it is good if I am tested for HIV			.736		
Cues8 I was asked to get tested for HIV as a requirement to donate blood or to go to abroad or other circumstances			.651		
Cues5 My parents insisted that I should be tested for HIV			.624		
Cues2 During the past one year, I have received advice from a health professional about HIV testing			.585		
Cues7 I know people close to me who are ill with HIV/AIDS			.501		
Efficacy4 I am confident that I can manage the physical pain and effects of HIV/AIDS from interfering with my daily life and future plans in case of positive result				-.747	
Efficacy2 I am confident that I can convince my girl/boyfriend to go for HIV testing				-.709	
Efficacy1 For me it would be easy to have HIV testing performed				-.692	
Efficacy5 I am confident that I can manage the emotional disturbances caused by HIV positive result from interfering with my normal daily life and future plans in case of positive result				-.618	
Efficacy3 I am confident that I can deal with health workers who are providing HIV testing services in order to get tested				-.586	
Severity4 If I am infected with HIV, I believe that HIV/AIDS could disrupt my family or social or economic activities					-.796

Item	Factor				
	1	2	3	4	5
Severity5 If I am infected with HIV, I believe that it could cause psychological problem to me					-.768
Severity3 If incase I am infected with HIV, I am afraid that HIV/AIDS could cause disability to me					-.594

Extraction Method: Principal Axis Factoring.

Rotation Method: Oblimin with Kaiser Normalization.

As can be seen in Table 5.8, factors were named based on the predetermined HBM constructs as follows.

Factor 1 was named as perceived barrier based on the interpretations of the items included in the initial scale. After removal of items through repeated EFA with low loading and cross loading, nine items with a factor loading of >0.50 were retained under that factor.

Factor 2 was named as perceived benefit again based on the original items interpretations in the scale. Six items with a factor loading of >0.50 loaded under that factor.

Factor 3 was named as cues to action and five items with a factor loading of >0.50 loaded under that construct.

Factor 4 was named as perceived self-efficacy and five items with a factor loading of >0.50 loaded under that factor.

Factor 5 was named as perceived severity and three items with a factor loading of >0.50 loaded under that factor.

Items originally proposed for perceived susceptibility had either low factor loading or cross loading or wrong loading under other factors and couldn't come under one uniform factor in this analysis.

5.3.4 Item retention and deletion

There are no consistent criteria or guideline as to how to retain or eliminate items. Fisher, Bandalos and Gerstner [Sa] found that fourteen different types of criteria were being used in the literature and/or recommended in the text books or other sources. Netemeyer et al (2003) suggest that in addition to criteria such as EFA, internal consistency and item based statistics; it is advisable to consider face and/or content validity to retain many items at the initial stage of tool development. The following criteria were used alone or in combinations for retention of items: pre-defined theoretical foundations and investigator's judgement (i.e. HBM), item-total correlation, alpha if item deleted, low factor loadings (<0.40), loading on wrong factor and cross-loading.

5.3.4.1 Perceived susceptibility

As can be seen from Table 5.7, all the nine items proposed for this factor either loaded under theoretically irrelevant constructs or had low factor loading (<0.40) which made the situation difficult for interpretation.

Even though the items did not demonstrate loading under a unique latent factor, because of the reliability assessment (Table 5.4) and face validity, the following items were retained for further analysis.

1. I believe that I am less susceptible to HIV because I have no HIV/AIDS related sign and symptoms
2. I believe that I am less susceptible to HIV/AIDS because I don't share sharp materials with other people
3. I am less concerned with HIV/AIDS because I don't have any sexual exposure
4. I don't consider myself to be at risk for HIV

5.3.4.2 Perceived severity

Among the seven items proposed for this construct, reliability analysis indicated that all the items were relevant except two items deletion of which improved the overall Cronbach's alpha (Table 5.4).

On EFA, three items loaded under this factor with a strong factor loading (Table 5.8). The remaining four items had either low factor loading or cross loading or had loaded under wrong factor.

All the originally proposed items except two were retained because reliability assessment showed acceptable Cronbach's alpha:

1. I believe that HIV/AIDS is non-curable disease
2. If in case I am infected with HIV, I am afraid that HIV/AIDS could cause death to me
3. If in case I am infected with HIV, I am afraid that HIV/AIDS could cause disability to me
4. If I am infected with HIV, I believe that HIV/AIDS could disrupt my family or social or economic activities
5. If I am infected with HIV, I believe that it could cause psychological problem to me

5.3.4.3   Perceived barrier

As indicated in table (Table 5.4), among eighteen items proposed for this construct, removal of three items had improved the overall Cronbach's alpha.

As indicated in Table 5.8, nine items loaded under this factor. Finally these nine items were retained for the final scale.

1. I am afraid of the stigma attached to HIV positive result
2. I don't want anyone to know that I'm sexually active/
3. at risk
4. I am afraid of hearing HIV positive result by undergoing HIV testing
5. I am afraid of separation from my friends and families due to my HIV positive result
6. I am afraid that people may talk about me if I go to a health facility for HIV testing
7. I am embarrassed to ask for HIV testing at HIV testing facilities
8. I don't want to wait long time at HIV testing facilities in order to have HIV testing

9.   I am worried about confidentiality at HIV testing facilities

10.   I am afraid that I may lose my partner if my HIV test result turned outto be positive

5.3.4.4   Perceived benefit

Among the seven items proposed for this construct, deletion of one item ("I don't believe that knowing my HIV status could improve the effect of HIV/AIDS on my health") improved the overall Cronbach's alpha (Table 5.4).

Five items loaded under this factor (Table 5.8) and all were retained.

The following **six items** were retained based on reliability and AFA:

1.   I feel that HIV testing will help me plan to avoid infection in the future

2.   HIV testing provides me the option to get early treatment before getting seriously sick

3.   I believe that I can plan my future with full confidence through knowing my HIV status

4.   I believe that HIV testing will provide me the option to know my HIV status and get emotional relief

5.   I believe that HIV testing would help me not to transmit HIV to others if in case I had HIV

6.   I believe that HIV testing help me identify my sexual partner based on her/his HIV status

5.3.4.5   Perceived self-efficacy

Among 10 items suggested for this construct, removal of one item had improved the overall Cronbach's alpha (Table 5.4). Further removal was not done as the level of over Cronbach's alpha was acceptable even though still there was a chance of removing more items to improve it.

Among ten items for this construct, only five items loaded under this construct. And the rest five items loaded wrongly under other factors. The following items were retained (Table 5.8).

1.   I am confident that I can manage the physical pain and effects of HIV/AIDS from interfering with my daily life and future plans in case of positive result
2.   I am confident that I can manage the emotional disturbances caused by HIV positive result from interfering with my normal daily life and future plans in case of positive result
3.   I am confident that I can convince my girl/boyfriend to go for HIV testing
4.   For me it would be easy to have HIV testing performed
5.   I am confident that I can deal with health workers who are providing HIV testing services in order to get tested

5.3.4.6   Cues to action

'Cronbach's alpha if item deleted' demonstrated that all the eight items were crucial to retain (Table 5.3).   However, EFA showed that five items loaded under this construct and one item wrongly loaded from other construct (Table 5.5).

The following were retained:

1.   My girlfriend/boyfriend usually thinks that it is good if I am tested for HIV
2.   I was asked to get tested for HIV as a requirement to donate blood or to go to abroad or other circumstances
3.   During the past one year, I have received advice from a health professional about HIV testing
4.   My parents insisted that I should be tested for HIV
5.   I know people close to me who are ill with HIV/AIDS

5.3.5 The final HTBS after the piloting study

The original HTBS with 59 items under the six components of the HBM, after undergoing EFA and reliability analysis, was reduced to HTBS with 34 items. The draft HTBS (Annex L & M) consisted of 4 items under perceived susceptibility, 5 items under

perceived severity, 6 items under perceived benefit,9 items under perceived barrier, 5 items under perceived self-efficacy, and 5 items under cues to action. The Cronbach's Alpha after the removal of five items improved from 0.557 to 0.758 for perceived susceptibility sub-scale. The Cronbach's Alpha for perceived severity improved from 0.644 to 0.715 after removal of two items. The Cronbach's Alpha for the perceived benefit sub-scale improved from 0.769 to 0.807 after removal of one item. The Cronbach's Alpha for the perceived self-efficacy sub-scale improved from 0.705 to 0.823 after removal of five items. The Cronbach's Alpha for the perceived barrier sub-scale improved from 0.864 to 0.882 after removal of nine items. The Cronbach's Alpha for the 'cues to action' sub-scale improved from 0.732 to 0.737 after removal of four items. The five items for HIV testing intention were retained and no changes were made to the items and the Cronbach's alpha was 0.888 for this construct.

5.4   CONCULUSION

The current chapter dealt with data management, analysis, presentation and interpretation of the results of the pilot survey intended to contribute to the development of the HTBS. The pilot study data were collected from 318 participants and the basic requirements for EFA were met. Principal axis factoring (PAF) was used to extract factors. Oblique rotation (Direct Oblimin) was used to rotate the factors so that it would be easier to interpret their underlying meanings. Item reliability analysis and EFA were considered to retain relevant items and delete irrelevant ones based on one or a combinations of criteria: pre-defined theoretical foundations and investigator's judgement (i.e. HBM), item-total correlation, alpha if item deleted, low factor loadings (<0.50), loading on wrong factor and cross-loading. Ultimately, the original HTBS with 64 items was reduced to HTBS with 39 items after undergoing EFA and reliability analysis.

In the next chapter the revised HTBS was further analysed to further refine it using CFA on data collected from cross-sectional survey.

CHAPTER 6

ANALYSIS, PRESENTATION AND DESCRIPTION OF THE FINDINGS OF THE CONFIRMATORY FACTOR ANALYSIS

6.1   INTRODUCTION

In the previous chapter the HTBS was refined and improved from 59-items scale to 39 items-scales by using reliability analysis and EFA based on sample survey on 318 subjects. It was also found that EFA has roughly produced a five-factor model with items that showed a factor loading of >0.40 even though the perceived susceptibility construct did not appear in the final matrix structure.

This chapter presents the analysis, findings and interpretations of the main cross-sectional survey that was intended to further test whether the HTBS scale that was finalised through EFA in the previous chapter actually fitted a sample survey data using a procedure called Confirmatory factor analysis (CFA): a subtype of structural equation modelling (SEM) technique.

6.2   DATA MANAGEMENT AND ANALYSIS

Data entry and cleaning was done using SPSS version 20. CFA was done using computer software called LISREL 9.2 after importing date from SPSS data file.

Data entry was done for 612 sample subjects and data cleaning was done by running frequency distributions. Descriptive statistics (frequency distribution, item mean and SD) to inspect the dispersions and central tendencies of the items was performed. Reliability tests (inter-item correlations, corrected item-to-total correlations, 'Cronbach's Alpha if Item Deleted' and Cronbach's Alpha for sub-scales) were performed. A measurement model component of structural equation modelling (SEM) called CFA was used to analyse whether the proposed items fit their corresponding seven constructs.

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6.3   RESEARCH RESULTS

The research result for the cross-sectional survey was presented on two levels. The first level was analysing the reliability and validity of the revised HTBS using reliability analysis and CFA which was presented in detail in this chapter. The second level of the result that was concerned with hypothesis testing pertaining to the second specific objective was presented in Chapter 7.

6.3.1 Socio-demographic characteristics of the sample

As indicated in Table 6.1, the average age of the respondents was 20.9 years with a SD of 1.9 and age ranged from 18-25 excluding four extreme cases with age ranging from 28-39. More than half (55.9%) of the respondents were male and majority of the sampled respondents were Amharas by ethnic group (62.7%) and are followers of orthodox Christianity (82.2%).

Table 6.1:   Socio-demographic characteristics of respondents (n=612)

Variables		Frequency	%
Gender	Male	327	55.9
	Female	258	44.1
	Total	**585**	**100.0**
Ethnicity	Oromo	82	14.2
	Amhara	363	62.7
	Tigrie	63	10.8
	Other	71	12.3
	Total	**579**	**100.0**
Religion	Orthodox	486	82.2
	Muslim	41	6.9
	Protestant	58	9.9
	Catholic	5	0.8
	Other	1	0.2
	Total	**591**	**100.0**
Marital status	Single	560	94.1
	Married	31	5.2
	Divorced	2	0.3
	Widowed	2	0.3
	Total	**595**	**100.0**
Class year	Year I	195	31.9
	Year II	147	24.0
	Year III	170	27.8
	Year IV or more	100	16.3
	Total	**612**	**100.0**

Variables		Frequency	%
Place of Growth	Rural setting	252	43.0
	Urban setting	334	57.0
	Total	**586**	**100.0**

6.3.2   Reliability assessment and item analysis

Thirty-nine items representing the six constructs (perceived susceptibility=5, perceived severity=7, perceived benefit=6, perceived barrier=10, perceived self-efficacy=5 and cues to action=6) of HIV testing Belief Scale (HTBS) were analysed for reliability. Five items dealing with HIV testing intention (dependent variable for the study) were also analysed for reliability.

The mean values of all the items were less than 5, which was consistent with 3-5 points Likert scale. However, it seemed that the mean concentrate around the mid-point which might indicate that respondents had a tendency of answering at the middle of the scale.

Analysis of the items had demonstrated that all the 44 items of the HTBS were not normally distributed. As indicated in Table 6.2, except for the Cronbach's Alpha of the perceived susceptibility and 'cues to action' constructs, all the rest constructs demonstrated higher Cronbach's Alpha of greater than 0.700.

Table 6.2:   Total statistics for the 44-items of HTBS under the seven constructs

Perceived susceptibility Items (Cronbach's Alpha=0.577)	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Suscpt1	12.62	9.541	.335	.130	.524
Suscpt2	14.42	11.532	.211	.072	.582
Suscpt3	13.20	9.263	.383	.161	.492
Suscpt4	12.13	10.196	.427	.211	.478
Suscpt5	12.75	10.403	.334	.149	.522
Perceived Severity Items (Cronbach's Alpha=0.700)					
Severity1	21.06	21.282	.262	.125	.705
Severity2	21.10	19.988	.394	.188	.671
Severity3	20.90	20.497	.497	.325	.651
Severity4	21.03	19.166	.521	.420	.638
Severity5	21.11	18.676	.586	.440	.621

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Severity6	22.17	19.831	.373	.263	.677
Severity7	22.56	20.299	.301	.230	.699
Perceived Benefit Items (Cronbach's Alpha=0.787)					
Benefit1	20.36	13.476	.452	.251	.777
Benefit2	20.07	13.801	.597	.375	.746
Benefit3	20.49	12.758	.529	.317	.758
Benefit4	20.23	12.801	.629	.401	.733
Benefit5	20.10	13.225	.610	.399	.740
Benefit6	20.37	13.208	.460	.240	.777
Perceived Barrier (Cronbach's Alpha=0.807)					
Barrier1	20.89	43.920	.464	.333	.792
Barrier2	20.74	42.527	.548	.415	.783
Barrier3	20.51	42.691	.523	.370	.786
Barrier4	20.34	44.653	.356	.200	.806
Barrier5	20.86	43.977	.504	.297	.788
Barrier6	20.58	44.955	.376	.167	.803
Barrier7	20.55	42.569	.514	.287	.787
Barrier8	20.89	44.048	.520	.401	.787
Barrier9	20.91	43.364	.564	.434	.782
Barrier10	20.74	43.878	.501	.358	.788
Perceived self-efficacy Items (Cronbach's Alpha=0.737)					
Efficacy1	15.08	9.066	.510	.302	.688
Efficacy2	15.06	9.116	.537	.338	.679
Efficacy3	15.10	8.990	.493	.269	.693
Efficacy4	15.39	8.635	.502	.284	.690
Efficacy5	15.54	8.613	.464	.259	.707
Cues to action Items (Cronbach's Alpha=0.550)					
Cues1	9.50	5.817	.091	.043	.576
Cues2	10.18	4.483	.370	.168	.466
Cues3	10.41	4.454	.425	.272	.441
Cues4	10.34	4.460	.380	.261	.461
Cues5	10.06	4.898	.219	.076	.542
Cues6	10.50	4.817	.267	.094	.518
HIV testing intention items (Cronbach's Alpha=0.846)					
Test_inten1	13.49	18.173	.545	.301	.847
Test_inten2	13.05	17.667	.712	.524	.800
Test_inten3	12.98	18.062	.661	.462	.813
Test_inten4	13.31	17.932	.658	.468	.814
Test_inten5	12.93	17.696	.711	.514	.800

6.3.3 Structural Equation Modeling (SEM): Confirmatory factor analysis

Byrne (2010:3) defines SEM as 'a statistical methodology that takes a confirmatory (i.e., hypothesis-testing) approach to the analysis of a structural theory bearing on some phenomenon'. It assesses the relationship between one and more dependent and independent variables irrespective of measurement scale and whether directly measured (observed variables) or indirectly measured (latent variables) (Ullman 2006:35).

SEM has two sets of equations: measurement equation and structural equation. Measurement equation/model assesses relationship between latent variables and their observed variables (respective indicators) which is represented by a series of regression equations or models**.** While**,** structural equation measures the relationship among latent variables which allow testing the statistical hypotheses for the study (Byrne 2010:3; Carvalho & Chima 2014:6). The overall goal of SEM is to test whether a theoretical model based on theory or empirical data is supported by sample data using scientific method of hypothesis testing to advance our understanding of the relationship among constructs. SEM tests three basic theoretical models: regression, path and confirmatory factor models (Schumacker & Lomax 2010:2).

Carvalho and Chima (2014:6) and Schumacker and Lomax (2010:2) define the following terminologies commonly used in SEM:

* Latent Variables - Variables that are not directly measured
* Exogenous Variables - Variables that are not affected by other variables in the model.
* Endogenous Variables - Variable that is caused by other variables in the model.
* Indicator Variables - Variables that are directly observed and measured (also known as manifest variables in some circles).
* Measurement Model - This is a part of the entire structural equation model diagram hypothesised for the study including all observations that load onto the latent variable, their relationships, variances, and errors.

- Structural Model - This is a part of the total hypothesised structural equation model diagram, which includes both latent and indicator variables.
- Structural Equation Model - This model combines the structural model and the measurement model, which includes everything that has been measured and observed among the variables examined.

The part of SEM model that connects the measured variables to factors (constructs) is called measurement model. The type of analysis that estimates this measurement model is called Confirmatory factor analysis (CFA) (Ullman 2006:37). CFA helps to test the hypothesis that relationship between observed variables (items for the case of this study) and latent variables; and it addresses important issues such as the validity of the structure of a scale (Diana & Shay [Sa]; Ullman 2006:37).

According to Ullman (2006), three main questions can be answered by CFA:

1. Do the parameters of the model combine to estimate a population covariance matrix (estimated structured covariance matrix) that is highly similar to the sample covariance matrix (estimated unstructured covariance matrix)?
2. What are the significant relationships among variables within the model?
3. Which nested model provides the best fit to the data?

In this study, only the first two questions were addressed based on the objective of the study. The first question checks the closeness of the parameters of population covariance matrix (estimated structured covariance matrix) and sample covariance (estimated unstructured covariance matrix) using chi-square test statistic and fit indexes which are discussed below. After checking the model fit, the second question that was looking into the estimates, standard errors and individual significance tests (path coefficients and covariance) on parameters were performed. The overall goal of CFA for this study is to determine if the set of items assigned for the six constructs of HBM in the HTBS are adequate indicators of the six underlying constructs (factors): perceived susceptibility to HIV/AIDS, perceived severity of HIV/AIDS, perceived benefit of HIV testing, perceived barriers towards HIV testing, perceived self-efficacy to take HIV testing and 'Cues to action' for HIV testing. Moreover, HIV testing intention was also analysed using CFA.

Even though there is no universally agreed reporting guideline on CFA/SEM, the following steps have been undertaken to do the CFA modelling process and to report on the findings of the CFA as recommended by Boomsma (2000:463), McDonald and Ho (2002:65), Schumacker and Lomax (2010:55-67), Carvalho and Chima (2014:7) and Jackson, Gillaspy, Purc-Stephenson 2009:9-10 and Kline (2011:91-92).

- Model specification
- Model identification
- Model estimation
- Testing Model fit
- Model Manipulation

Before proceeding to the detailed process of CFA, data preparation was performed and the main assumptions for CFA were checked.

Sample size

A total of 612 students completed the self-administered 44-items HTBS scale. There is no consistent guideline as to the number of sample that is needed to conduct SEM/CFA; however various authors are suggesting different guidelines. For example, the sample size for this study was more than 300 as suggested by Dilorio (2005) and exceeds subject to variable ratio of 5:1 as suggested by Streiner (1994). Anderson and Gerbing (1988) recommends that 100-150 is the minimum sample size to conduct SEM. On the other hand Costello and Osborne (2005) suggest that 20 subjects per variable are recommended for best practices in factor analysis.

The 612 cases were considered for the analysis of CFA. Variable values were missing for 10-90 of the cases for the 44 items (variables) considered for CFA. These missing data were imputed using multiple imputation method and were substituted by the mean for missing values of the variables as recommended by Schumacker and Lomax (2010:20). There were no outliers for all the 44 observed variables (items).

6.3.3.1 Model specification

Model specification is an important first step in analysing a confirmatory factor model (Schumacker & Lomax 2010). In this study, the six latent constructs of HBM and HIV testing intention were specified as measured using HTBS that contains 44 items (**observed variables**): 5 items under perceived susceptibility, 7 items under perceived severity, 10 items under perceived barrier, 5 items under perceived self-efficacy, 6 items under cues to action, and 5 items under HIV testing intention. The confirmatory factor models for each of the seven latent variables that contained specified observed variables (items) were specified. The drawing conventions used in the consecutive CFA models as defined by Schumacker and Lomax (2010:165-166) and Ullman (2006:36-37) were explained as follows:

- Measured variables (observed variables) also called items for this study are represented by squares or rectangles.
- Factors, also called constructs or latent variables are represented by circles or ovals
- A line with one arrow represents a hypothesised direct relationship between two variables. The variable the arrow pointing to is affected by the other variable.
- A curved, double-headed line between two factors indicates that they have shared variance or are correlated.
- A curved, double-headed line between two measurement error variances indicates that they also have shared variance or are correlated.
- The measurement errors are represented by smaller ellipses and indicate that some portion of each observed variable is measuring something other than the hypothesised factor.

There were seven latent variables, which were represented by a set of observed variables as shown in Table 6.3, which depicts variable names and items used in the analysis of CFA. The seven latent variables with their corresponding items (variables) were analysed separately using CFA.

Each of the seven CFA models was represented using number of measurement equations (number of free parameters) which was calculated by summing up:

1. the number of factor loadings which equals with the number of observed variables (items)

2. the number of measurement error variances which equals with number observed variables

In the CFA models, it was assumed that there were no correlations among the latent variables and zero measurement error covariance terms or correlations; hence were not considered under number of free parameters.

Table 6.3: Variable names and HTBS items that correspond with each of the seven models used in the analysis of CFA

Variable Name	HTBS items
Perceived Susceptibility	
Susc1	I am afraid that I might contract HIV
Susc2	I believe that there is a chance that I might be infected with HIV/AIDS in the next one year
Susc3	I believe that I might get HIV even if I am having sex with only one partner
Susc4	I believe that I might be infected with HIV if my sex partner is having unsafe sex with others
Susc5	I believe that I might be infected with HIV even if I am using condom
Perceived Severity	
Sever1	I believe that HIV/AIDS is non-curable disease
Sever2	If incase I am infected with HIV, I am afraid that HIV/AIDS could cause death to me
Sever3	If incase I am infected with HIV, I am afraid that HIV/AIDS could cause disability to me
Sever4	If I am infected with HIV, I believe that HIV/AIDS could disrupt my family or social or economic activities
Sever5	If I am infected with HIV, I believe that it could cause psychological problem to me
Sever6	I would rather have any other terminal illness than AIDS
Sever7	I would rather die from a violent death (e.g. gun shot, car accident, etc) than from AIDS
Perceived Benefit	
Ben1	I believe that HIV testing will provide me the option to know my HIV status and get emotional relief
Ben2	I feel that HIV testing will help me plan to avoid infection in the future
Ben3	HIV testing provides me the option to get early treatment before getting seriously sick
Ben4	I believe that I can plan my future with full confidence through knowing my HIV status
Ben5	I believe that HIV testing would help me not to transmit HIV to others if incase I had HIV
Ben6	Benefit6 I believe that HIV testing help me identify my sexual partner based on her/his HIV status
Perceived Barrier	
Bar1	I am afraid of hearing HIV positive result by undergoing HIV testing
Bar2	I am afraid of the stigma attached to HIV positive result
Bar3	I am afraid of separation from my friends and families due to my HIV positive result
Bar4	I don't want to wait long time at HIV testing facilities in order to have HIV testing
Bar5	I am embarrassed to ask for HIV testing at HIV testing facilities
Bar6	I am worried about confidentiality at HIV testing facilities
Bar7	I am afraid that I may lose my partner if my HIV test result turned out to be positive
Bar8	I don't want anyone to know that I'm sexually active/ at risk

Variable Name	HTBS items
Bar9	I am afraid that people may talk about me if I go to a health facility for HIV testing
Bar10	I will have to wait for long time for the HIV test result
Perceived self-efficacy	
Effic1	For me it would be easy to have HIV testing performed
Effic2	I am confident that I can convince my girl/boyfriend to go for HIV testing
Effic3	I am confident that I can deal with health workers who are providing HIV testing services in order to get tested
Effic4	I am confident that I can manage the physical pain and effects of HIV/AIDS from interfering with my daily life and future plans in case of positive result
Effic5	I am confident that I can manage the emotional disturbances caused by HIV positive result from interfering with my normal daily life and future plans in case of positive result
Cues to action	
Cues1	I recall seeing TV or billboards or posters or messages about the importance of HIV testing during the past one year
Cues2	During the past one year, I have received advice from a health professional about HIV testing
Cues3	My girlfriend/boyfriend usually thinks that it is good if I am tested for HIV
Cues4	My parents insisted that I should be tested for HIV
Cues5	I know people close to me who are ill with HIV/AIDS
Cues6	I was asked to get tested for HIV as a requirement to donate blood or to go to abroad or other circumstances
HIV testing intentions	
Inten1	I have ever thought about getting HIV testing
Inten2	How likely are you in need of HIV counseling and testing service the next time you go for health care services?
Inten3	How likely are you to accept HIV testing if you are requested to get tested for HIV the next time you go for health care services
Inten4	How likely are you to get tested for HIV in the next three months?
Inten5	How likely are you to do regular HIV testing in the future?

6.3.3.2 Model identification

After specifying the CFA models, it was critical to check if the models were identified. In this study, model identification process assessed if the factors loading of each of the items on its respective factor were identified or could be estimated. In order to check this, it was important to assess order condition. If the number of free parameters to be estimated must be less than or equal to the number of distinct values in the matrix S, then the model is called over identified (Schumacker & Lomax 2010:167-168).

Factor loading and measurement errors variances that correspond with the number of observed variables or items were determined for each of the seven CFA models specified for this study as indicated in Table 6.4. Moreover, it was assumed that there were no measurement error covariance terms or correlations for each of the seven CFA models. The number of distinct values in the matrix S was calculated by a formula: p (p + 1)/2 (where p is number of observed variables in the sample variance–covariance

matrix). The number of distinct values in the matrix S was greater than the number of free parameters for each of the seven CFA models indicating that the models were identified. The difference between the two was the degree of freedom, which must be greater or equal to zero and it satisfied the order and rank conditions for the equation of every endogenous variable.

Table 6.4:   Number of free parameters and distinct values in the matrix S for each of the seven CFA models

CFA Models	Number of observed variables in the models	Number of free parameters	Number of distinct values in the matrix S	DF
Perceived susceptibility	5	10	30	20
Perceived severity	7	14	56	42
Perceived benefit	6	12	42	30
Perceived barrier	10	20	110	90
Perceived self-efficacy	5	10	30	20
Cues to action	6	12	56	42
HIV testing intention	5	10	30	20

6.3.3.3   Model estimation

Following model identification, it was important to estimate the parameters of the specified factor model. There are various types of fitting functions or estimation procedures depending on distributional assumptions and scale dependency (Schumacker & Lomax 2010:59-63). In the case of severe non-normality for interval data, one of the distribution free or weighted procedures (ADF, WLS or GLS) is recommended (Lomax 1989). In summary, Schumacker and Lomax (2010:62-63) recommend the use of ML estimation for slight to moderate non-normal interval and ordinal data, and ADF, WLS, or GLS estimation for severely non-normal interval and ordinal data.

The normality assumptions for the observed variables in this study were not met and hence the confirmatory model for this study was analysed using generalised least squares (GLS) with a standardised solution to report the statistical estimates of the free parameters. GLS is a member of a larger family of methods known as fully weighted

least squares (WLS) estimation that can be used for severely non-normal data and it is scale free and scale invariant (Kline 2011:176; & Barrett 2007:815-824).

6.3.3.4   *Testing model fit*

After obtaining parameter estimates for the seven models, the next step was to determine how well the data fitted the hypothesised models. In other words, it is evaluation of the degree of discrepancy between the true population covariance matrix and that implied by the model's structural and nonstructural parameters (Kline 2011:63 and Mueller & Hancock 2013:490). In summary, it is the process of assessing a structural equation model with goodness-of-fit indices (Carvalho & Chima 2014:7).

There is no definitive or gold standard set of fit statistics that would help in determining which model to retain or reject. However there are various guidelines on how to interpret Fit statistics which can be considered as rule of thumb (Kline 2011:190-191; Lacobucci 2010:90-91). Lacobucci (2010:90-91) recommends that researchers should report the following profile of indices: the $\chi2$ (and its degrees of freedom and p-value), the standardised root mean square residual (SRMR), and the comparative fit index (CFI).

The following three criteria are currently being used to judge the statistical significance and substantive meaning of a theoretical model (Schumacker & Lomax 2010:74-77):

- The first criterion is the non-statistical significance of chi-square ($\chi2$) test and the root-mean-square error of approximation (RMSEA) values, which are global fit measures. A non-significant $\chi2$ ($p>0.05$) indicate that the data fits with the proposed model. The $\chi2$ is the only inferential statistic for which hypothesis testing is possible; and all the rest are descriptive for which there exist only "rules-of-thumb" to assess goodness-of-fit. The limitations with $\chi2$ is that it is sensitive to sample size. A $\chi2$ will almost always be significant (indicating a poor fit) even with only modest sample sizes (Lacobucci 2010:91). A RMSEA value less than or equal to 0.08 is considered acceptable.
- The second criterion is the statistical significance of individual parameter estimates for the paths in the model. This is assessed using a t value and t value of 1.96 or more (at the .05 level of significance or less) is considered significant.

- The third criterion is the magnitude and direction of the parameter estimates. This enables checking whether positive or negative coefficient makes sense for the parameter estimate.

The following Model-Fit Criteria and Acceptable Fit Interpretation are suggested by Schumacker & Lomax (2010:76).

Table 6.5:   Model-fit criteria and acceptable fit interpretation

Model-fit criterion	Acceptable level	Interpretation
Chi-square	Tabled X2 value	Compares obtained Chi-square value with tabled value for given df
Goodness-of-fit index (GFI)	0 (no fit) to 1 (perfect fit)	Value close to .90 or .95 reflect a good fit
Adjusted GFI (AGFI)	0 (no fit) to 1 (perfect fit)	Value adjusted for df, with .90or .95 a good model fit
Root-mean-square error of approximation (RMSEA)	.05 to .08	Value of .05 to .08 indicate close fit
Standardised root mean square residual (SRMR)	< .05	Value less than .05 indicates a good model fit

(Adapted from Schumacker & Lomax 2010:76)

In CFA, the main concern is validation of the measurement model that looks into whether the items are indeed good indicators of constructs in the case of this study. In order to achieve this goal, a separate CFA model should be run for each set of observed variables which were hypothesised to indicate their respective latent variables (constructs) (Carvalho & Chima 2014:8).

6.3.3.5   Initial test of the CFA model and model modifications

In the current study, seven CFA model were run using GLS estimation method separately for the six constructs of HBM (perceived susceptibility, perceived severity, perceived benefit, perceived barrier, perceived self-efficacy and cues to action) and the dependent variable (HIV testing intention) using Lisrel 9.2 computer software. The model fit criteria described in Table 6.5 were used to evaluate the models. Because the

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sample size for this study was greater than 200, the X2 value might likely be significant and this criterion didn't work for some of the models.

According to Schumacker and Lomax (2010:64-68), there is no single adequate procedure for finding a properly specified model and the authors recommend the following procedures:

- Check if the model has practical significance and substantive meaning
- Look to see if the parameters are of the expected magnitude and direction, and examine several appropriate goodness‑of‑fit indices
- Observe the statistical significance of each parameter estimated in the model. T-value needs to be greater than 1.96 for each observed variables.
- Examine the residual matrix. Large standardised residuals (larger than 2.58) indicate that a particular covariance structure is not well explained by the model.

To identify model misspecifications, the standard residuals and the modification indices were inspected in addition to statistical significance of each parameter, magnitude and directions of the parameters, and model fit indices for each of the sub-scale using Lisrel 9.2.

Based on standard residuals and model fit indices (MIs), the original models were modified and the model fit indices were re-screened when the criteria mentioned in Table 6.5 were met. The chi-square test of model fit could likely be significant, because the sample size of 612 which was taken for the analysis was greater than 200 as explained by Schumacker and Lomax (2010:86). Given this rationale, the other model fit indices (RMSEA and GFI) were considered as a deciding criterion whether to accept or reject a specific model in this study.

As reflected in Table 6.6, as expected, the chi-square values were significant for all the seven CFA initial models. This was more likely attributed to the large sample size (612).The RMSEA values exceeded the cut of point 0.08 for all the CFA models except for HIV testing intention. The GFI (criterion ≥0.90) was met by four of the CFA models except for the rest three (perceived severity, perceived barrier, and perceived self-efficacy).

Table 6.6: Initial test of CFA models (n=612)

Sub-scales	Chi-square	DF*	P-value	RMSEA	GFI	AGFI
Perceived susceptibility	57.18	5	0.00000	0.131	0.909	0.726
Perceived severity	285.19	14	0.00000	0.178	0.753	0.506
Perceived benefit	46.9	9	0.00000	0.083	0.934	0.845
Perceived barrier	426.86	35	0.00000	0.135	0.747	0.602
Perceived self-efficacy	64.89	5	0.00000	0.140	0.899	0.696
Cues to action	55.87	9	0.00000	0.092	0.922	0.818
Intention for HIV testing	19.01	5	0.00191	0.068	0.965	0.894

The following section discusses the seven CFA initial and final models and their corresponding model fit indices, parameter estimates and parameter significance after undergoing modifications. The sections conclude with the set of items that were retained in the final HTBS.

6.3.3.5.1 Perceived susceptibility

The parameter significance (t-value) as generated using Lisrel 9.2 was greater than 1.96 for all the five items (observed variables) in the initial model. The factor loadings for all the five observed variables in the initial model were greater than 0.40 except for one variable (Susc2) as indicated in Figure 6.1.

In the initial perceived susceptibility model, the standardised residual table demonstrated that, only one covariance (between Susc2 and Susc3) exceeded the cutoff point of 2.58. The t-statistics didn't suggest the elimination of any existing parameters from the initial path model because every parameter was statistically different from zero (t-value >1.96). With regard to the possible inclusion of new parameters, the largest modification index was for the path from Susc2 to Susc3 (MI=50).
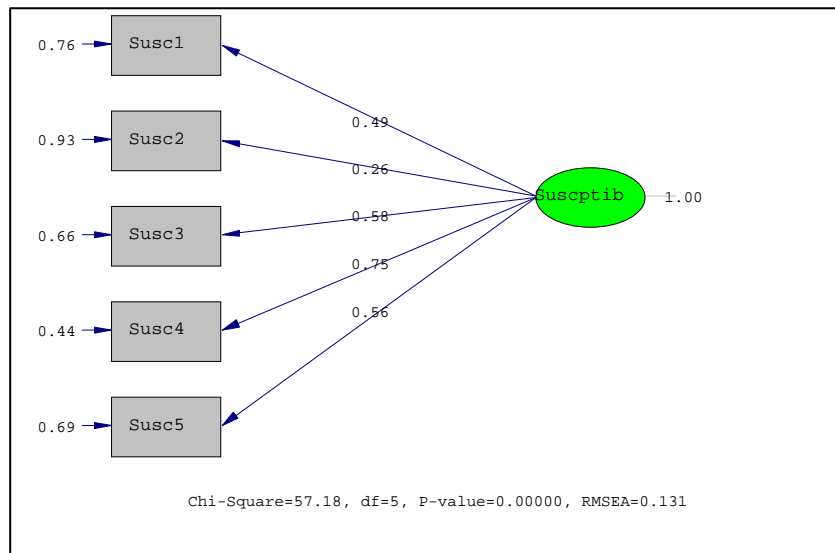
Figure 6.1: Initial model for perceived susceptibility

Therefore, the model needed to be modified in order to improve chi-square values and model fit indices by adding a path between Susc2 and Susc3.

The model structure with standardised regression weights for modified model was presented in Figure 6.2. The model fit indices for the modified model were substantially better than the initial model as indicated in Table 6.7 indicating a non-significant X2 value, RMSEA <0.08 and GFI/AGFI >0.90.

The parameter significance (t-value) as generated using Lisrel 9.2 was greater than 1.96 for all the five items (observed variables) for the modified model. The factor loadings for all the five observed variables in the modified model were greater than 0.40 except for one variable (Susc2) as indicated in Figure 6.2.

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Figure 6.2: Modified model for perceived susceptibility

6.3.3.5.2 Perceived severity

The parameter significances (t-value) as generated using Lisrel 9.2 were greater than 1.96 for all the seven items (observed variables) in the initial model. As indicated in Figure 6.3, the factor loading for all the seven observed variables in the initial model were greater than 0.40 except for two variables (Sever 1 & Sever 7).

In the initial perceived severity model, the standardised residual table demonstrated that four co-variances between: Sever 1 & 2, Sever 3 & 6, Sever 4 & 6 and Sever 6 & 7 exceeded the cutoff point of 2.58. The t-statistics didn't suggest the elimination of any existing parameters from the initial path model because every parameter was statistically different from zero (t-value >1.96). With regard to the possible inclusion of new parameters, the largest modification index was for the path from Sever 6 to Sever 7 (MI=216.9).

Chi-Square=285.19, df=14, P-value=0.00000, RMSEA=0.178

Figure 6.3: Initial model for perceived severity

In order to improve the model, paths between Sever 1 & 2, Sever 3 & 6, Sever 4 & 6 and Sever 6 & 7 were added in the model. The model structure with standardised regression weights for modified model was presented in Figures 6.4.

As indicated in Table 6.7, the model fit indices for the modified model were better than the initial model even though the X2 value was still significant. The RMSEA had shown improvement with a value <0.08 and GFI also improved to >0.90.

The parameter significance (t-value) as generated using Lisrel 9.2 was greater than 1.96 for all the seven items (observed variables) for the modified model. The factor loadings for all the seven observed variables in the modified model were greater than 0.40 except for two variables (Sever 6 & 7) as indicated in Figure 6.4.
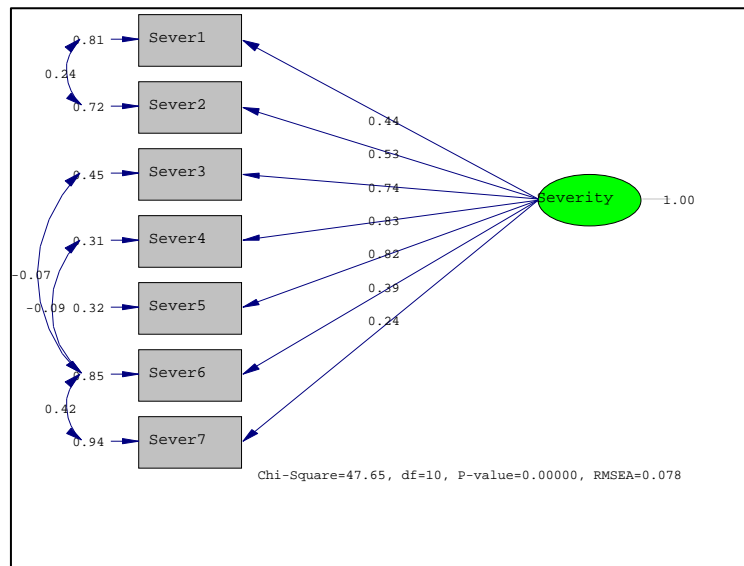
Figure 6.4: Modified model for perceived severity

6.3.3.5.3 Perceived benefit

The parameter significances (t-value) as generated using Lisrel 9.2 were greater than 1.96 for all the six items (observed variables) in the initial model. The factor loadings for all the six observed variables in the initial model were greater than 0.40 as shown in Figure 6.5.

In the initial perceived severity model, the standardised residual table demonstrated that only one covariance between Ben 1 & Ben 4 exceeded the cutoff point of 2.58. The t-statistics didn't suggest the elimination of any existing parameters from the initial path model because every parameter was statistically different from zero (t-value >1.96). With regard to the possible inclusion of new parameters, the largest modification index was for the paths from Ben 1 to 2 (MI=20.2), Ben 1 to 5 (MI=20.1) and Ben 5 to 6 (MI=9.7).

In order to improve the model, paths between Ben 1 & 4, Ben 1 & 2, Ben 1 & 5 and Ben 5 & 6 were added in the model. The model structure with standardised regression weights for modified model was presented in Figures 6.6.

The model fit indices for the modified model were substantially improved from the initial model as indicated in Table 6.7 showing a non-significant X2 value, and RMSEA <0.08. And also both GFI and AGFI exhibited a value >0.90.

The parameter significances (t-value) as generated using Lisrel 9.2 were greater than 1.96 for all the parameters except for one in the modified model. The factor loadings for all the six observed variables in the modified model were greater than 0.40 as shown in Figure 6.6.
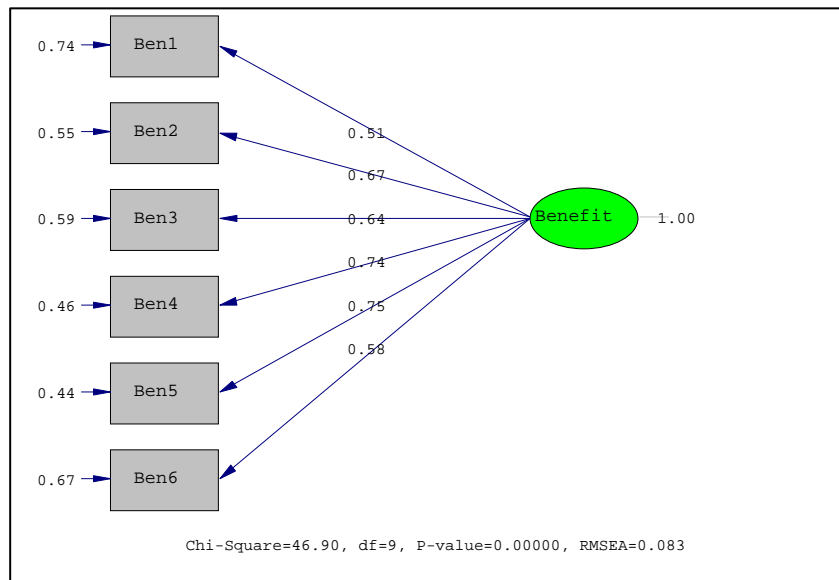
Figure 6.5: Initial model for perceived benefit
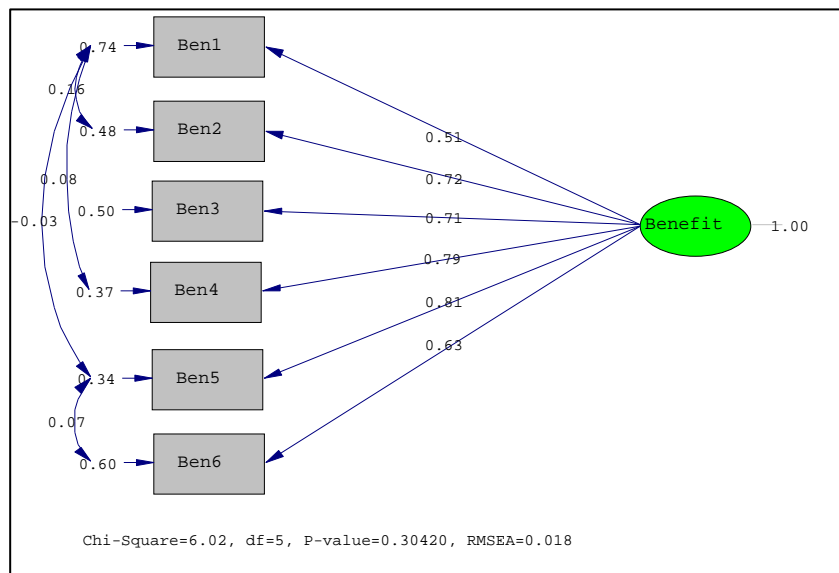
Figure 6.6: Modified model for perceived benefit

6.3.3.5.4 Perceived barrier

The parameter significances (t-value) as generated using Lisrel 9.2 were greater than 1.96 for all the ten items (observed variables) in the initial model. The factor loading for all the ten observed variables in the modified model were greater than 0.40 as shown in Figure 6.7.

In the initial perceived severity model, the standardised residual table demonstrated that nine covariances between: Bar 1 & 5, Bar 1 & 10, Bar 2 & 3, Bar 2 & 10, Bar3 & 8, Bar 3 & 10, Bar 4 & 6, Bar 4 & 8, and Bar 4 & 10 exceeded the cutoff point of 2.58. The t-statistics didn't suggest the elimination of any existing parameters from the initial path model because every parameter was statistically different from zero (t-value >1.96). With regard to the possible inclusion of new parameters, the largest modification index was for the paths from Bar 8 to 9 (MI=87.7), Bar 2 to 3 (MI=86), Bar 3 to 10 (MI=64.8), Bar 1 to 5 (MI=39.2), Bar 2 to 10 (MI=38.2), Bar 4 to 10 (MI=36.8), Bar 5 to 9 (MI=33.4) and Bar 2 to 9 (MI=33.6).
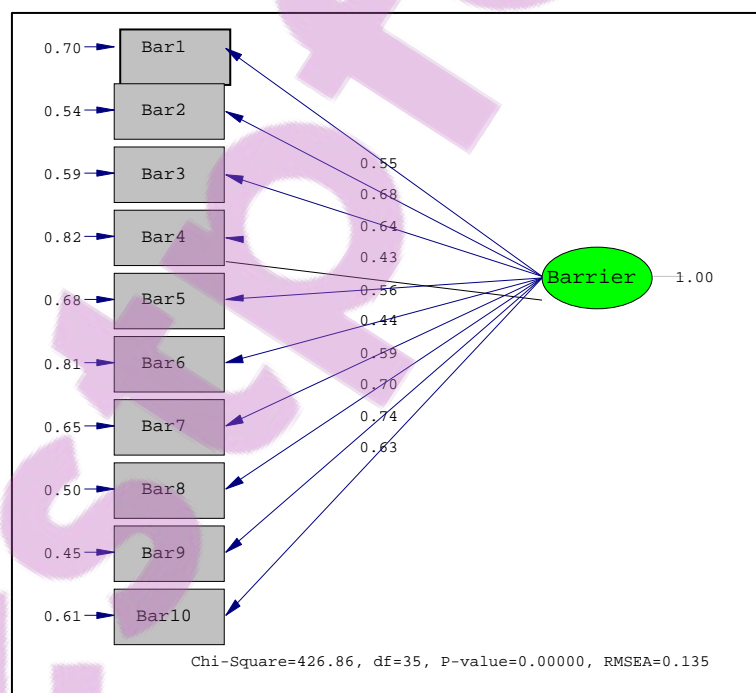
Figure 6.7: Initial model for perceived barrier

The model was modified by including paths between: Bar 3 & 2, Bar 1 & 5, Bar 4 & 6, Bar3 & 8, Bar 4 & 8, Bar 1 & 10, Bar 2 & 10, Bar 3 & 10 and Bar 4 & 10. However, the model fit indices has not been improved substantially and another round of model

modification was performed to improve the model. Further addition of paths between Bar 1 & 2, Bar 8 & 9, Bar 6 & 9, Bar 5 & 9, Bar 2 & 9 and Bar 4 & 5 has improved model fit indices even though the X2 value still remained significant. he value of RMSEA was <0.08 and GFI is >0.90 as indicated in Table 6.7.

The model structure with standardised regression weights for the modified model is presented in Figure 6.8.

The parameter significances (t-value) as generated using Lisrel 9.2 were greater than 1.96 for all the parameters except for two parameters in the modified model. The factor loading for all the ten observed variables in the modified model were greater than 0.40.
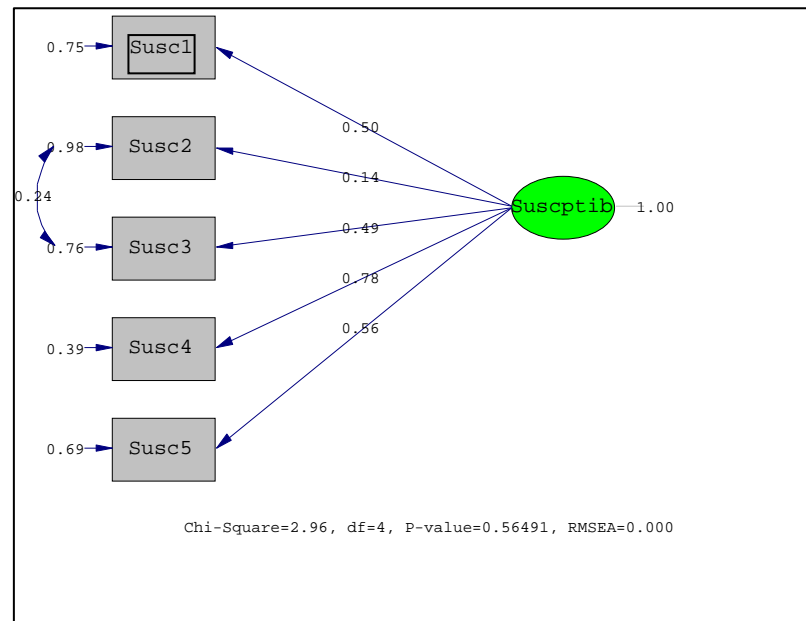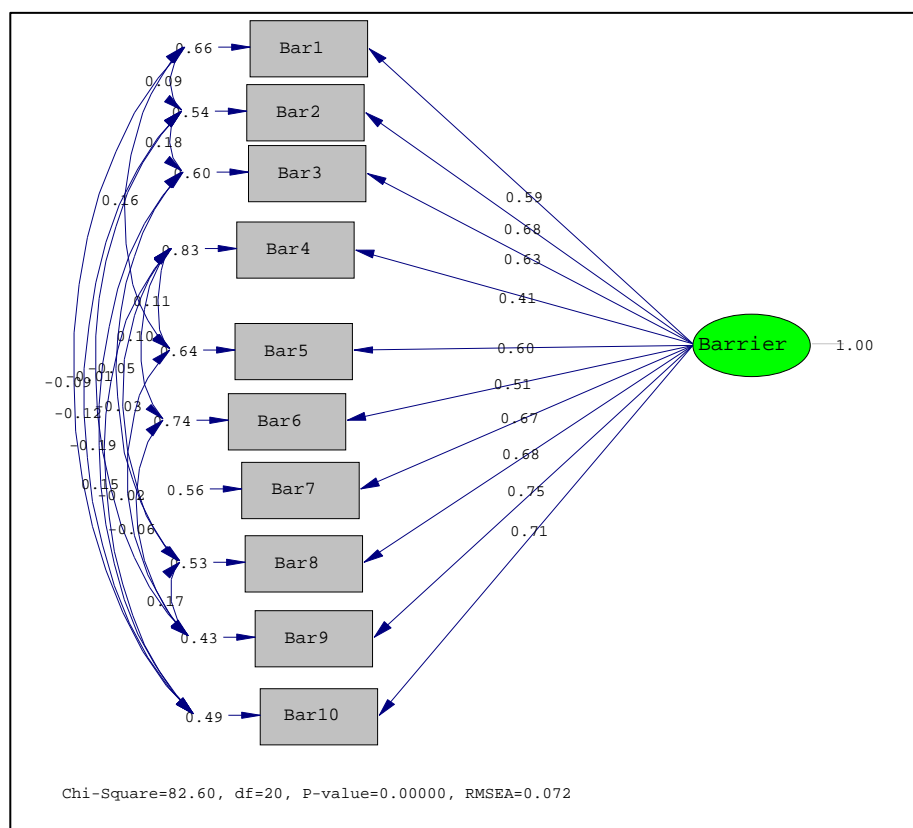

Figure 6.8: Modified model for perceived barrier

6.3.3.5.5 *Perceived self-efficacy*

The parameter significances (t-value) as generated using Lisrel 9.2 were greater than 1.96 for all the five items (observed variables) in the initial model. As indicated in Figure

6.9, the factor loading for all the five observed variables in the modified model were greater than 0.40.

In the initial perceived severity model, the standardised residual table demonstrated that only one covariance between Effic 4 & 5 exceeded the cutoff point of 2.58. The t-statistics didn't suggest the elimination of any existing parameters from the initial path model because every parameter was statistically different from zero (t-value >1.96). With regard to the possible inclusion of new parameters, the largest modification index was for the paths from Effic 4 to 5 (MI=50.5), Effic 2 to 5 (MI=31.1) and Effic 2 to 4 (MI=29.3).
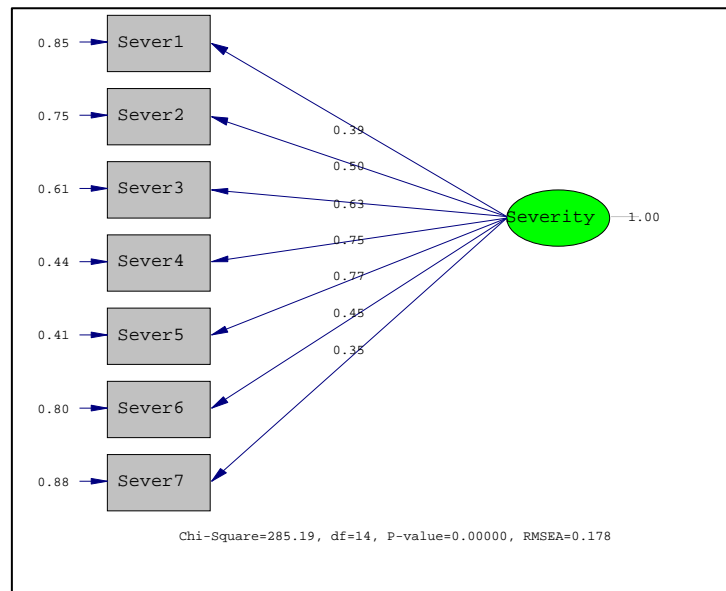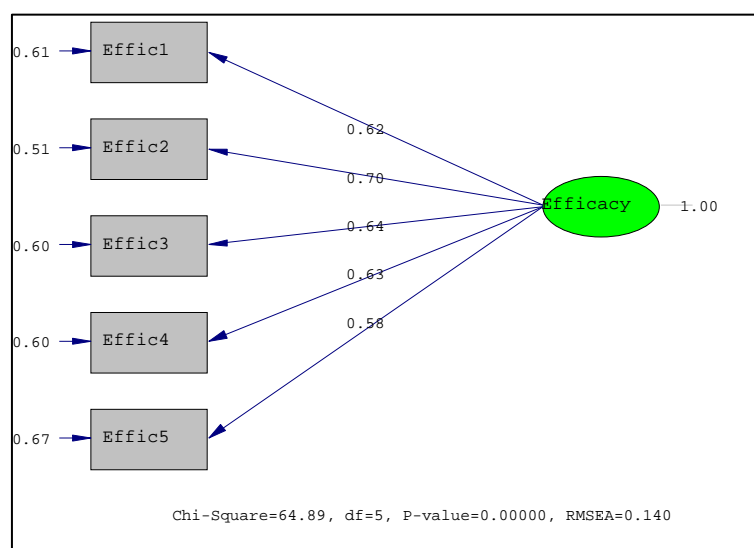

Figure 6.9: Initial model for perceived self-efficacy

The model was modified by drawing paths between Effic 4 & 5, Effic 2 & 5 and Effic 2 & 4.

The model fit indices for the modified model were substantially improved from the initial model as indicated in Table 6.7 showing a non-significant X2 value, and RMSEA <0.08. Also both GFI and AGFI exhibited a value >0.90. The model structure with standardised regression weights for the modified model is presented in Figure 6.10.

The parameter significances (t-value) as generated using Lisrel 9.2 were greater than 1.96 for all the parameters in the modified model. As indicated in Figure 6.10, the factor loading for all the five observed variables in the modified model were greater than 0.40.

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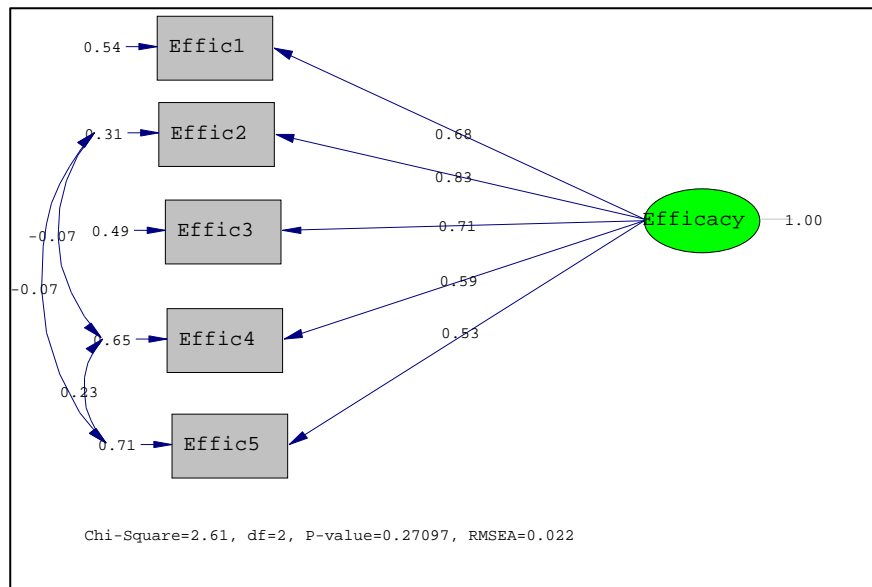
Figure 6.10: Modified model for perceived self-efficacy

6.3.3.5.6 Cues to action

The parameter significances (t-value) as generated using Lisrel 9.2 were greater than 1.96 for all the except for one item (Cues 1) in the initial model. The factor loading for three observed variables (Cues 2, Cues 3 & Cues 4) in the modified model were greater than 0.40 and for the rest three it was less than 0.40 as indicated in Figure 6.11.

In the initial model, the standardised residual table demonstrated that two covariances between: Cues 1 & 5 and Cues 5 & 6 exceeded the cutoff point of 2.58. The t-statistics suggested the elimination of one parameters (Cues1) from the initial path model because its t-value was less than 1.96. With regard to the possible inclusion of new parameters, the largest modification index was for the paths from Cues5 to 6 (MI=27.4), Cues3 to 6 (MI=10.3) and Cues 1 to 5 (MI=11.3).
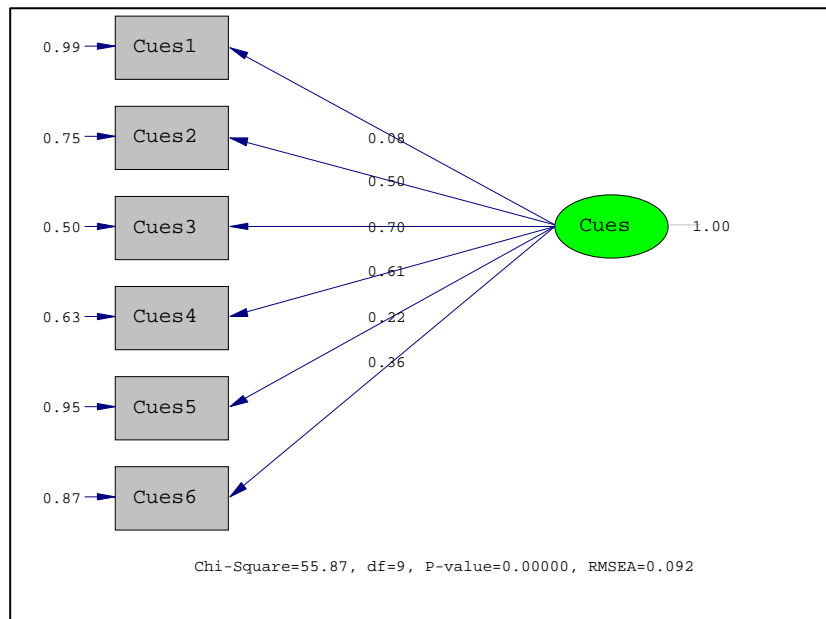
Figure 6.11: Initial model for cues to action

The model was modified by drawing paths between Cues 5 & 6, Cues 3 & 6 and Cues1 & 5.

The model structure with standardised regression weights for the modified model is presented in Figure 6.12.

As indicated in Table 6.7, the model fit indices for the modified model have substantially been improved even though the X2 value still remained significant. The RMSEA value was <0.08 and GFI was >0.08.

The parameter significances (t-value) as generated using Lisrel 9.2 were greater than 1.96 for all the six items except for one (Cues 1) in the modified model. The factor loading for three observed variables (Cues 2, Cues 3 & Cues 4) in the modified model were greater than 0.40 and it remained still less than 0.40 for the remaining three items.
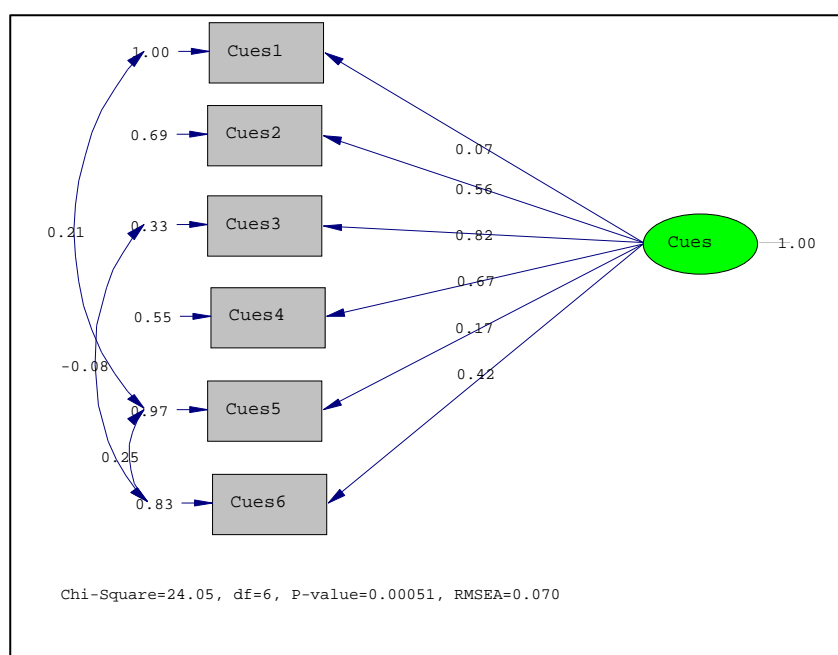
Figure 6.12: Modified model for cues to action

6.3.3.5.7 HIV testing intention

The parameter significances (t-value) as generated using Lisrel 9.2 were greater than 1.96 for all the parameters in the initial model. The factor loading for all the five items in the initial model were greater than 0.40 as indicated in Figure 6.13.

In the initial model, the standardised residual table demonstrated that only one covariance between Inten 2 & 4 exceeded the cutoff point of 2.58. The t-statistics didn't suggest the elimination of any parameters from the initial path model because every parameter was statistically different from zero (t-value >1.96). With regard to the possible inclusion of new parameters, the largest modification index was for the paths from Inten2 to 5 (MI=23.2) and Inten3 to 4 (MI=13.7).

The model was modified by drawing paths between Inten 2 & 5 and Inten 3 & 4.

The model structure with standardised regression weights for the modified model is presented in Figure 6.14.

The model fit indices for the modified model were substantially improved from the initial model as indicated in Table 6.7. The X2 value was non-significant. The values of RMSEA was<0.08 and values for GFI and AGFI were >0.90.

The parameter significances (t-value) as generated using Lisrel 9.2 were greater than 1.96 for all the five items (observed variables) for the modified models. The factor loading for all the five observed variables in the modified model were greater than 0.40.
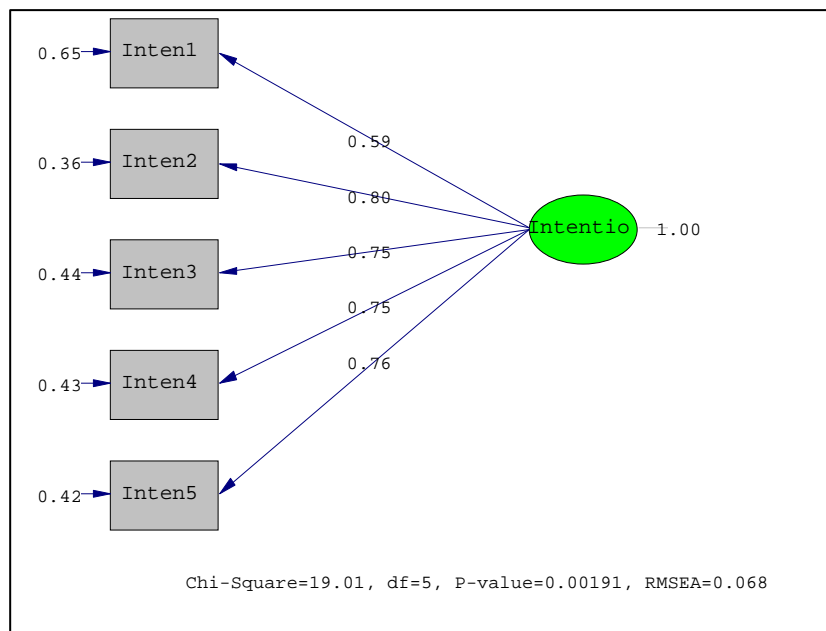
Figure 6.13: Initial model for intention
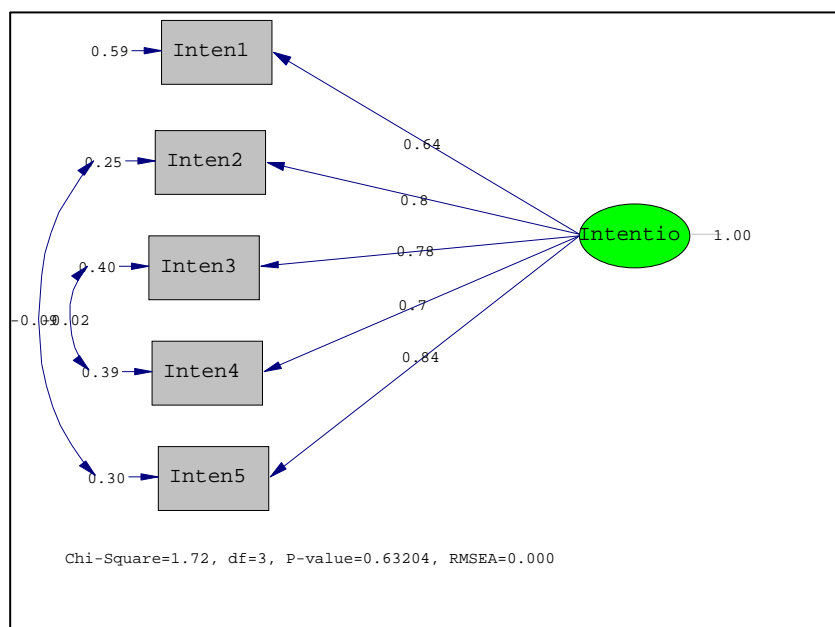

Figure 6.14: Modified model for intention

In summary, as it was depicted in Table 6.7, the model fit indices for each of the seven modified sub-scale models showed that the Chi-square values for four models

(perceived susceptibility, perceived benefit, perceived self-efficacy and HIV testing intention) were non-significant indicating that the observed and implied variance‑covariance matrices were similar it meant that the data fit the proposed models.

However, the chi-square values were significant for the remaining three models (perceived severity, perceived barrier and cues to action) suggesting that the observed and implied variance‑covariance matrices differ. This was due to partly the large sample size that would result in most likely significant chi-square values. Considering practical significance and values of RMSEA and GFI, these models were also accepted.

Table 6.7:   Fit indices for the seven sub-scale modified models (n=612)

Sub-scales	Chi-square	DF*	P-Value	RMSEA	GFI	AGFI
Perceived susceptibility	2.96	4	0.56491	0.000	0.994	0.979
Perceived severity	47.65	10	0.00000	0.078	0.941	0.835
Perceived benefit	6.02	5	0.30420	0.018	0.991	0.960
Perceived barrier	82.60	20	0.00000	0.07	0.930	0.808
Perceived self-efficacy	2.61	2	0.27097	0.022	0.995	0.962
Cues to action	24.05	6	0.00051	0.070	0.964	0.874
Intention for HIV testing	1.72	3	0.63204	0.000	0.997	0.983

The final HTBS

Based on the final seven models, the factor loading was inspected for all the items under each modified models and were presented in Table 6.8. Inspection of factor loading for the 44 items in the final sub-scale models demonstrated that factor loading ranges from 0.07 to 0.87.

Table 6.8:   Factor loading for the final HIV Testing Belief Scale (HTBS)

HTBS items	Factor loadings
Perceived Susceptibility	
Susc1- I am afraid that I might contract HIV	0.50
Susc2-I believe that there is a chance that I might be infected with HIV/AIDS in the next one year	0.14
Susc3-I believe that I might get HIV even if I am having sex with only one partner	0.49
Susc4-I believe that I might be infected with HIV if my sex partner is having unsafe sex with others	0.78
Susc5-I believe that I might be infected with HIV even if I am using condom	0.56
Perceived Severity	
Sever1-I believe that HIV/AIDS is non-curable disease	0.44
Sever2-If incase I am infected with HIV, I am afraid that HIV/AIDS could cause death to me	0.53
Sever3-If incase I am infected with HIV, I am afraid that HIV/AIDS could cause disability to me	0.74
Sever4-If I am infected with HIV, I believe that HIV/AIDS could disrupt my family or social or economic activities	0.83
Sever5-If I am infected with HIV, I believe that it could cause psychological problem to me	0.82
Sever6-I would rather have any other terminal illness than AIDS	0.39
Sever7-I would rather die from a violent death (e.g. gun shot, car accident, etc) than from AIDS	0.24
Perceived Benefit	
Ben1-I believe that HIV testing will provide me the option to know my HIV status and get emotional relief	0.51
Ben2-I feel that HIV testing will help me plan to avoid infection in the future	0.72
Ben3-HIV testing provides me the option to get early treatment before getting seriously sick	0.71
Ben4-I believe that I can plan my future with full confidence through knowing my HIV status	0.79
Ben5-I believe that HIV testing would help me not to transmit HIV to others if incase I had HIV	0.81
Ben6-Benefit6 I believe that HIV testing help me identify my sexual partner based on her/his HIV status	0.63
Perceived Barrier	
Bar1-I am afraid of hearing HIV positive result by undergoing HIV testing	0.59
Bar2-I am afraid of the stigma attached to HIV positive result	0.69
Bar3-I am afraid of separation from my friends and families due to my HIV positive result	0.69
Bar4-I don't want to wait long time at HIV testing facilities in order to have HIV testing	0.41
Bar5-I am embarrassed to ask for HIV testing at HIV testing facilities	0.60
Bar6-I am worried about confidentiality at HIV testing facilities	0.51
Bar7-I am afraid that I may lose my partner if my HIV test result turned out to be positive	0.67
Bar8-I don't want anyone to know that I'm sexually active/ at risk	0.69
Bar9-I am afraid that people may talk about me if I go to a health facility for HIV testing	0.75
Bar10-I will have to wait for long time for the HIV test result	0.71
Perceived self-Efficacy	
Effic1-For me it would be easy to have HIV testing performed	0.68
Effic2-I am confident that I can convince my girl/boyfriend to go for HIV testing	0.83
Effic3-I am confident that I can deal with health workers who are providing HIV testing services in order to get tested	0.71

HTBS items	Factor loadings
Effic4-I am confident that I can manage the physical pain and effects of HIV/AIDS from interfering with my daily life and future plans in case of positive result	0.59
Effic5-I am confident that I can manage the emotional disturbances caused by HIV positive result from interfering with my normal daily life and future plans in case of positive result	0.53
Cues to action	
Cues1-I recall seeing TV or billboards or posters or messages about the importance of HIV testing during the past one year	0.07
Cues2-During the past one year, I have received advice from a health professional about HIV testing	0.56
Cues3-My girlfriend/boyfriend usually thinks that it is good if I am tested for HIV	0.82
Cues4-My parents insisted that I should be tested for HIV	0.67
Cues5-I know people close to me who are ill with HIV/AIDS	0.17
Cues6-I was asked to get tested for HIV as a requirement to donate blood or to go to abroad or other circumstances	0.42
HIV testing intentions	
Inten1-I have ever thought about getting HIV testing	0.64
Inten2-How likely are you in need of HIV counseling and testing service the next time you go for health care services?	0.87
Inten3-How likely are you to accept HIV testing if you are requested to get tested for HIV the next time you go for health care services	0.78
Inten4-How likely are you to get tested for HIV in the next three months?	0.78
Inten5-How likely are you to do regular HIV testing in the future?	0.84

In summary, as indicated in Table 6.8, all items except five items (1 under perceived susceptibility, 2 under perceived severity and 2 under cues to action) demonstrated a factor loading of >0.40. Items with factor loading of less than 0.40 can be considered for possible exclusion in future studies.

6.4   CONCULUSION

The current chapter was concerned with analysis, interpretation and presentation of the analysis of findings of CFA in order to further refine the HBTS through assessing whether measurement model of the SEM does confirm the fact that the proposed seven sub-scales in the HTBS do fit a sample data. A cross-sectional survey data collected on randomly selected 612 university students was utilised to address the objective mentioned above.

Thirty-nine items representing the six constructs that were retained through EFA were analysed using CFA method separately. Five items dealing with HIV testing intention (dependent variable for the study) were also analysed by CFA.

The final CFA models indicated that the chi-square values were not significant for the four CFA modified models (perceived susceptibility, perceived benefit, perceived self-efficacy and HIV testing intentions) indicating that the proposed models fitted the data. However, chi-square value was significant for three of the CFA modified models (perceived severity, perceived barrier and cues to action) indicating that the proposed models didn't fit the data. However, the RMSEA values were less than 0.08 for all the seven modified models supporting the fact that the models fitted the data. Inspection of factor loading for the 44 items in the final seven modified models demonstrated that factor loading ranges from 0.07 to 0.87. All items except five items (1 under perceived susceptibility, 2 under perceived severity and 2 under cues to action) demonstrated a factor loading of >0.40. After removing the five items, the final HTBS contained only 39 items.

Analysis of reliability using Cronbach's alpha of the final HTBS with 39 items indicated that it was >0.70 for all the sub-scales except for perceived susceptibility (0.594) and cues to action (0.597) which did not meet the criteria. However, reliability of 0.60 or more can sometimes be tolerated if there is strong face validity and theoretical relevance. Hence, the investigator suggests to retain items for the two constructs and further check the reliability in separate studies and improve the items.

In the next chapter, the cross-sectional data were analysed and interpreted in order to address one of the objectives of this study concerned with addressing analysis of HIV testing intentions and recent history of HIV testing through addressing hypothesis set under this objective.

CHAPTER 7

ANALYSIS, PRESENTATION AND DESCRIPTION OF THE FINDINGS ON HIV TESTING INTENTION AND BEHAVIOUR AMONG UNIVERSITY STUDENTS

7.1   INTRODUCTION

In the previous chapter the HTBS scale was refined and finalised using a confirmatory factor analysis technique based on cross-sectional survey data.

In this chapter, the second objective of the study regarding hypothesis related to HIV testing intentions and behaviours of university students, was analysed and presented in detail. Further analysis on the cross-sectional survey data was presented to address the following hypotheses as mentioned in chapter 1.

- Socio-demographic variables are not associated with HIV testing intention and recent history of HIV testing.
- Level of knowledge about HIV/AIDS is not associated with HIV testing intention and recent history of HIV testing.
- Level of perceived severity is not associated with HIV test intentions and recent history of HIV testing.
- Perceived susceptibility is not correlated with HIV test intentions and recent history of HIV testing.
- Level of perceived benefit don't predict HIV test intention and recent history of HIV testing positively.
- Level of self-efficacy don't predict HIV test intention and recent history of HIV testing positively.
- Level of cues to action regarding voluntary HIV counseling don't predict HIV test intention and recent history of HIV testing positively.
- Level of perceived barrier is not associated with HIV test intentions and recent history of HIV testing.

7.2   DATA MANAGEMENT AND ANALYSIS

As indicated in Chapter 6, data entry and cleaning was done using SPSS version 20. Data entry was done for 612 sample subjects and data cleaning was done by running frequency distributions and inspecting missing values and irregularities in the data. Descriptive statistics to inspect frequencies, dispersions and central tendencies of the different socio-demographic and main research variables were performed using SPSS version 20. Bivariate analysis such as correlations, independent samples t-test, analysis of variance (ANOVA) and Chi-square test were performed as applicable to the hypothesis being tested or questions to be addressed. Multiple linear regression was run in order to predict the effect of an independent variable, for example, socio-demographic or knowledge about HIV/AIDS or the six constructs of HBM on dependent variable of the study (HIV testing intention) by controlling the effect of other independent variables. Binary-logistic regression was also run in order to analyse recent history of HIV testing based on the independent variables mentioned above through controlling the effect of other independent variables.

7.3   RESEARCH RESULTS

7.3.1 Socio-demographic characteristics

The socio-demographic characteristics of the sample were explained in Chapter 6 and Table 6.1 summarises the basic socio demographic characteristics. Because of the importance of the socio-demographic variables as predictors of both HIV testing intention and HIV testing behaviour, some analyses were done on these variables.

As indicated in Table 6.1, the average age of the respondents was 20.9 years and the age of the respondents ranged from 18-25 excluding four extreme cases with age ranging from 28-39. More than half (55.9%) of the respondents were male and the majority of the sampled respondents were Amharas by ethnic group (62.7%) and are followers of orthodox Christianity (82.2%). The majority were Amhara and orthodox Christians because most of the students joined the university from Amahara region where Orthodox Christianity is the dominant religion.

As expected, of the 595 respondents who responded for the marital status question, 94.1% of the respondents were single and the remaining few were either married or widowed or divorced.

Regarding the distribution of class years as indicated in Figure 7.1, the samples were fairly distributed across class years based on proportion to population size in each class year as indicated in the sampling procedures.
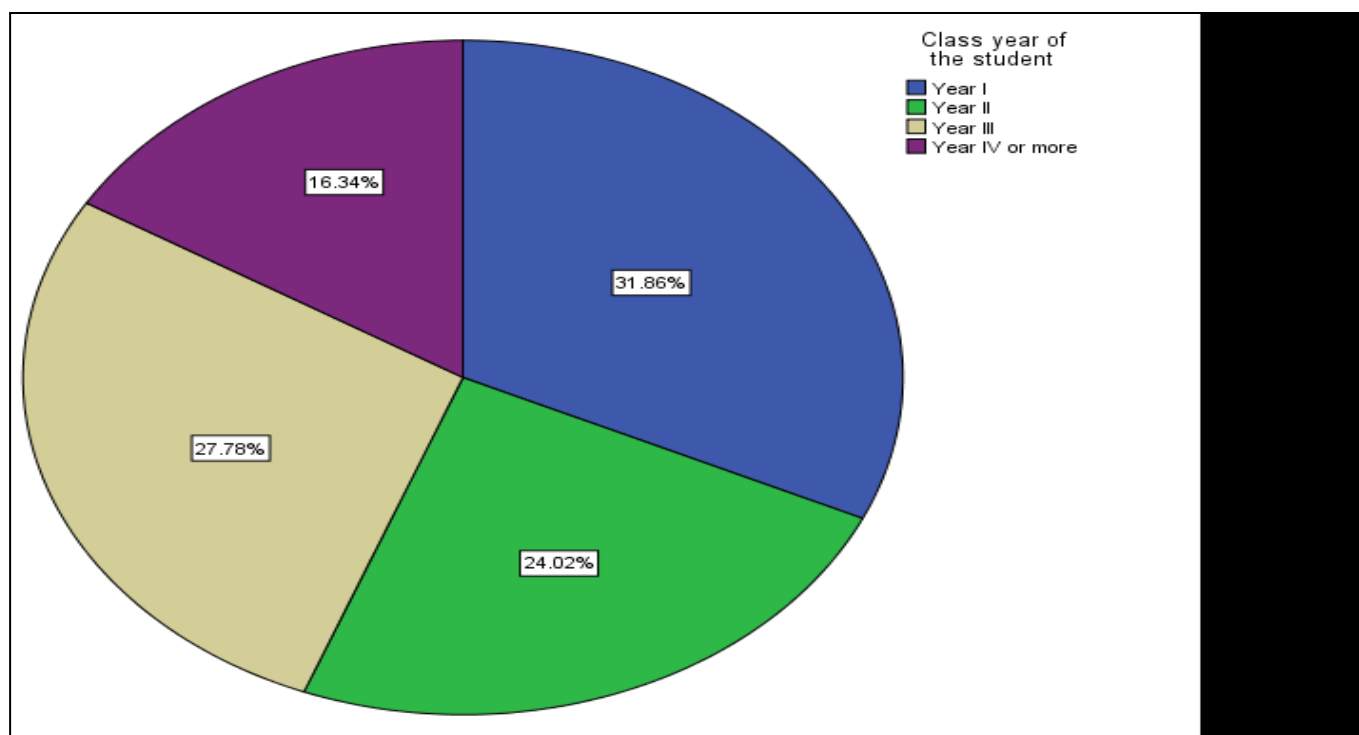
Figure 7.1: Pie chart showing distribution of respondents by Class years (n=612)

The students were sampled from various departments and randomly selected as shown in Table 7.1.

Table 7.1: Departments randomly selected for the cross-sectional survey with corresponding student size (n=612)

Department	Student size	Percent
Construction technology	170	27.8
Health officer	94	15.4
Information technology	33	5.4
Law	38	6.2
Midwifery	41	6.7
Nursing science	43	7.0
Psychology	75	12.3
Sociology	68	11.1
Sport science	50	8.2
Total	**612**	**100.0**

More than half (i.e. 57% (334) of the students grew up in urban setting and had urban background and the rest (43%) grew up in rural settings and had a rural background.

7.3.2 Comprehensive knowledge about HIV/AIDS

The comprehensive knowledge about HIV/AIDS was assessed as part of background information that was used as one of the independent variables in order to predict HIV testing intentions and recent history of HIV testing behaviour among university students. It was measured using five questions with Yes/No responses which were adapted from Ethiopian demographic health survey (EDHS) standard questions. According to Table 7.2, most of the students (>85%) had accurately answered questions related to prevention of HIV/AIDS and one of the question mentioned under row 3 that addresses misconceptions related to HIV/AIDS. However, more than 70% of students still have misconceptions regarding transmission mechanism of HIV/AIDS as mentioned under row 4 and 5 in the same table.

Table 7.2: **Comprehensive knowledge of students as assessed by five key questions adapted from EDHS questionnaire**

Serial No	Comprehensive knowledge about HIV/AIDS questions	Yes (Total)	%
1	HIV can be prevented by using condom	499 (586)	85.2
2	HIV can be prevented by limiting sexual intercourse to one uninfected partner	545 (584)	93.3
3	A healthy looking person can have the AIDS virus	563 (587)	95.9
4	The HIV virus can be transmitted by mosquito bites	133 (568)	23.4
5	The HIV virus can be transmitted by supernatural means	158 (586)	27.0

Knowledge score was generated for each respondent by summing up the number of correct responses obtained from the survey. The total score ranged from 0 (i.e. if a student was wrong in all the five questions to 5 (i.e. if a student was right in all the five questions). The average knowledge score for the respondents was 4.3 with SD of 0.86.

7.3.3 HIV testing history of university students

Results showed that 68% (n=544) of the students had reported that they have ever been tested for HIV in their life time. In order to assess students' current history of HIV testing, students were asked if they have been tested in the last 12-months prior to the data collection time. Only 44.7% (n=561) have reported that they had recent history of HIV testing from which 89.2% have received their HIV test result.

7.3.4 Prediction of HIV testing intentions and recent HIV testing history based on various independent variables using bivariate analysis

In this study, HIV testing intention and recent history of HIV testing were the two outcome variables that were analysed based on the six constructs of HBM which were considered as predictors of the two outcome variables. Socio-demographic and knowledge about HIV/AIDS variables were considered as modifying or indirect influencers of the outcome variables.

In the first stage of the analysis, bivariate analysis was conducted in order to see one-on-one relationship or correlations of independent variables with the two outcome

variables using the following bivariate analysis techniques as applicable: correlations, independent samples T-test, cross-tabulations (chi-square), ANOVA and binary logistic regression.

In the second stage of the analysis, multivariate analyses were conducted in order to determine the effect of all the independent variables in a single model by controlling the effect of the rest independent variables. Multiple linear regression was run in order to determine the influence of independent variables on HIV testing intention which was measured on a continuous scale. Binary logistic regression was run in order to determine the effect of independent variables over recent history of HIV testing which was measured on a nominal dichotomous scale.

Before the analyses, a summary score was calculated for HIV testing intention and the six constructs of HBM by adding values of each of the items that make up each of the constructs using SPSS version 20. Recent HIV testing history was measured by including question with Yes/No responses in the survey question that says: "Have you been HIV tested during the past one year?".

7.3.4.1   Relationship between socio-demographic variables and HIV testing intentions/recent history of HIV testing

HBM hypothesises that, in addition to the six constructs of HBM, other variables such as socio-demographic, socio-psychological and structural factors indirectly influence behaviour through influencing beliefs related to susceptibility, severity, benefit and barriers.

In the current study, socio-demographic variables such as age, gender, ethnicity, religion, marital status and place of growth were analysed to check if there is a bi-variate relationship with either HIV testing intention or current history of HIV testing. Further analysis on socio-demographic variables in multivariate analysis was done in the latter section in order to decide if the role of socio-demographic variables is crucial by controlling the effect of other variables.

The Pearson product moment correlation coefficient analysis indicated that there was significant positive high correlation between age of the respondents and HIV testing

intentions [r=0.985, p=0.001]. However, independent samples T-test indicated that there was no significant age difference between those who had recent history of HIV testing and those who hadn't.

Moreover, there was no significant difference between mean values formale (16.3, SD=5.1) and female (16.7, SD=5.3) in terms of HIV testing intentions (r=0.504, df=494). A chi-square test indicated that there is no significant relationship between recent history of HIV testing and gender (X2=0.804, df=1, p=0.370).

The level of HIV testing intention was not significantly different among the four categories of ethnic groups (Oromo, Amahara, Tigrie and others) (F=1.693,df=3, p=0.168). However, a binary logistic regression that only included ethnicity in the equation indicated that Oromos are almost twice likely to have recent HIV testing history compared to Amahara ethnic group (OR=1.99,p=.011) and students from 'other category' (OR:2.1,p=0.032).

The level of HIV testing intention was not significantly associated with religion (F=2.1, df=2, p=0.123). Binary logistic regression that only included religion in the equation indicated that recent HIV testing history was not associated with religion.

Independent samples T-test indicated that there was no significant difference in the level of HIV testing intention between single ones (mean=16.5) and other groups combined (married, divorced and widowed) (mean=15.2), (p=0.180, df=502). A chi-square test indicated that there was no significance difference in the recent history of HIV testing history between single and other groups combined (married, divorced and widowed) (Chi-square value=1.799, df=1, p=0.180).

A one-way ANOVA indicated that the level of HIV testing intention was significantly different among different class year of students (F=3.49, df=3, p=0.016). A multiple pairwise comparison indicated that the difference in the level of HIV testing intention was observed between Class year I (mean=17.5, SD=5.0) and class year II (mean=15.8, SD=5.2). A binary logistic regression indicated that recent HIV testing history was not associated with class year.

Independent samples T-test was run in order to analyse if the mean values for the level of HIV testing intention was different between those who grew up in a rural setting (mean=16.8, SD=5.0) and those who grew up in an urban setting (mean value=16.2, SD=5.3). It was found that there was no significant difference between the two groups (p=0.208, df=496). A chi-square test has indicated that there was not significant association between recent HIV testing history and place of growth (Chi-square value=0.97, df=1, p=0.756).

7.3.4.2 Relationship between comprehensive knowledge about HIV/AIDS and HIV testing intentions/recent history of HIV testing

As indicated in Table 7.3, there was no significance correlations between HIV testing intentions and level of respondents' knowledge about HIV/AIDS (r=0.025, p=0.589). A binary logistic regression that only included knowledge about HIV/AIDS as independent variable indicated that the level of knowledge was not a significant predictor of recent history of HIV testing (OR=1.17, df=1, p=0.294).

Table 7.3: **Correlations of HIV testing intentions with the six constructs of HBM and age of respondents**

		HIV testing Intention score	HIV/AIDS Know-ledge score	Perceived Suscep-tibility score	Perceived severity score	Perceived benefit score	Perceived barrier score	Perceived self-efficacy score	Cues to action score	Age
HIV testing Intention score	Pearson Correlation	1	.025	.157**	.115*	.386**	-.194**	.388**	.328**	.001
	Sig. (2-tailed)		.589	.001	.014	.000	.000	.000	.000	.985
	N	515	460	468	460	428	388	444	446	366

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

7.3.4.3 Relationship between perceived susceptibility to HIV/AIDS and HIV testing intentions/recent history of HIV testing

The HBM theorises that an individual must believe that there is a chance of being affected with a certain health condition before taking preventive actions that will prevent disease or improve health (Champion & Skinner 2008:46-50). However, this is not consistent across various research findings regarding the relationship between AIDS

protective behaviours and perceived susceptibility (Basen-Engquist 1992; Hounton et al 2005; Mahoney, Thombs & Ford 1995; Steers et al 1996; Hounton et al 2005; Volk & Koopman 2001). As shown in Table 7.3, the Pearson product moment correlation coefficient analysis indicated that there was significant positive relationship between perceived susceptibility to HIV/AIDS and HIV testing intentions [r=0.157, p=0.001].

Even though there was a positive correlations between level of perceived susceptibility to HIV/AIDS and HIV testing intention, which was off course statistically significant and agreed with some of research findings as mentioned above; the researcher couldn't deduce from this bivariate analysis that one was the cause of the other since it was difficult to control the effect of other variables in this kind of analysis. This was further analysed using multiple linear regressions in the latter section.

The researcher has also analysed whether recent HIV testing history in the last 12 months before the conduct of the survey was associated with the level of perceived susceptibility to HIV/AIDS. Independent samples T-test was run in order to analyse if the mean values of for the level of perceived susceptibility to HIV/AIDS was different between those who had recent history of HIV testing (mean value=14.3, SD=3.5) and those who hadn't (mean value=14.5, SD=3.2). Levine's test for equality of variances was met with significance level of 0.181. The analysis showed that there was no significant difference (p=0.651, df=503) regarding the level of perceived susceptibility to HIV/AIDS between people who had recent history of HIV testing and people who didn't have.

7.3.4.4 *Relationship between perceived severity of HIV/AIDS and HIV testing intentions/recent history of HIV testing*

Most studies usually exclude measures of perceived severity of HIV/AIDS in HIV/AIDS behavioural studies because of the expectation that everyone would report HIV/AIDS as the most sever disease (Rosenstock, Strecher & Becker 1994). However, because of the advent and scale up of ART, this may not be true in the current situation, hence the researcher has included measures of perceived severity as part of this study in order to see how it plays in the HBM.

A correlation analysis was performed in order to establish whether there was a positive correlation between the level of perceived severity about HIV/AIDS and HIV testing intentions. As shown in Table 7.3, the Pearson product moment correlation coefficient analysis indicated that there was significant positive relationship between perceived severity of HIV/AIDS and HIV testing intentions [r=0.115, p=0.014].

The researcher also analysed data about significant difference in the level of perceived severity between people who had recent history of HIV testing and those who didn't have. Independent samples T-test demonstrated that there was no statistical significance difference (p=0.648, df=493) between the mean values for the level of perceived severity about HIV/AIDS between those who had recent history of HIV testing (mean value=19.8, SD=3.8) and those who hadn't (mean value=19.6, SD=4.1). Note that Levine's test for equality of variances was met with significance level of 0.317.

7.3.4.5 Relationship between perceived benefit of HIV testing and HIV testing intentions/recent history of HIV testing

As indicated in Table 7.3, the Pearson product moment correlation coefficient analysis showed that there was a significant positive correlation between perceived benefit of HIV testing and HIV testing intentions [r=0.386, p=0.000].

Independent samples T-test demonstrated that there was a statistical significance difference (p=0.053, df=462) between the mean values for the level of perceived severity about HIV/AIDS between those who had recent history of HIV testing (mean value=24.8, SD=3.8) and those who hadn't (mean value=24.1, SD=4.4). Note that Levine's test for equality of variances was met with significance level of 0.067.

7.3.4.6 Relationship between perceived barrier towards HIV testing and HIV testing intentions/recent history of HIV testing

Champion and Skinner (2008:47) hypothesise that if individuals believe that the benefit of taking actions outweighs the barriers or costs to action, it is likely that they will take actions. With regards to HIV/AIDS related health behaviours, many studies have found that there is a significant relationship between condom use and perceived barriers (Hounton et al 2005; Volk & Koopman 2001).

Similarly, the correlation between the perceived barrier towards HIV testing and HIV testing intentions supported the results of the above researches. As indicated in Table 7.3, the Pearson product moment correlation coefficient analysis showed that there was a significant negative correlation between perceived barrier towards HIV testing and HIV testing intentions [r=-0.194, p=0.000].

In contrast, independent samples T-test has demonstrated that there was no statistical significance difference (p=0.780, df=324.5) between the mean values for the level of perceived severity about HIV/AIDS between those who had recent history of HIV testing (mean value=22.9, SD=8.2) and those who had not (mean value=23.1, SD=6.6). Note that Levine's test for equality of variances was not met (p=0.001).

7.3.4.7   Relationship between perceived self-efficacy regarding HIV testing and HIV testing intentions/recent history of HIV testing

It has been evidently documented that there is strong relationship between perceived self-efficacy and safe sexual behaviour including condom use (Lin et al 2005; Steers & et al 1996; Zak-Place & Stern 2004). As indicated in Table 7.3, the Pearson product moment correlation coefficient analysis indicated that there was significant positive relationship between perceived self -efficacy related to HIV testing and HIV testing intentions [r=0.388, p=0.000].

In contrast, independent samples T-test has demonstrated that there was no statistical significance difference (p=0.140, df=481) between the mean values for the level of perceived self-efficacy regarding HIV testing between those who had recent history of HIV testing (mean value=19.3, SD=3.6) and those who hadn't (mean value=18.8, SD=3.6). It is noteworthy that Levine's test for equality of variances was met (p=0.624).

7.3.4.8   Relationship between 'cues to action' regarding HIV testing and HIV testing intentions/recent history of HIV testing

Cues to action are mostly missing from studies that are using HBM (Champion & Skinner 2008:62).

In the current study, in line with the theoretical assumptions of the HBM, Pearson product moment correlation coefficient analysis indicated that there was significant positive relationship between cues to action (reminders for HIV testing) and HIV testing intentions r=0.328, p=0.000] as indicated in Table 7.3.

In a similar way, independent samples T-test has demonstrated that there was a statistical significance difference (p=0.000, df=475) between the mean values for the level of perceived self-efficacy regarding HIV testing between those who had recent history of HIV testing (mean value=8.4, SD=2.1) and those who hadn't (mean value=6.7, SD=1.9). Levine's test for equality of variances was met (p=0.156).

7.3.4.9   Prediction of HIV testing intentions and recent HIV testing history based on various independent variables using multiple linear regression and binary logistic regression

Prediction of HIV testing intention using multiple linear regressions

Multiple linear regression was run using SPSS version 20 in order to assess to the extent to which the following explanatory variables predict HIV testing intention among university students. The following explanatory variables were included in the model:

- Socio-demographic variables (age, gender, ethnicity, religion, marital status, class year and place of growth)
- Knowledge about HIV/AIDS
- The six constructs of HBM (perceived susceptibility, perceived severity, perceived benefit, perceived barrier, perceived self-efficacy and cues to action)

Explanatory variables that had more than two nominal categories (religion and ethnicity) were recoded into dummy variables and one of the categories was considered as a reference for each dummy variable.

The assumptions for standard multiple linear regression were reported as follows:

- A Large sample size is recommended for running multiple regressions. It is recommended that at least 15 subjects per a predictor are acceptable. The

sample size was 612 which can be considered fairly large (i.e. 47 subjects per predictor).

- Homoscedasticity - this means that the variances of the residuals need to be the same at each level of the explanatory variable/s. As indicated in Figure 7.2, a scatter plot of the regression standardised predicted value on the x-axis and regression standardised residual distribution showed a rough rectangular shape indicating that the assumption of homoscedasticity was met.
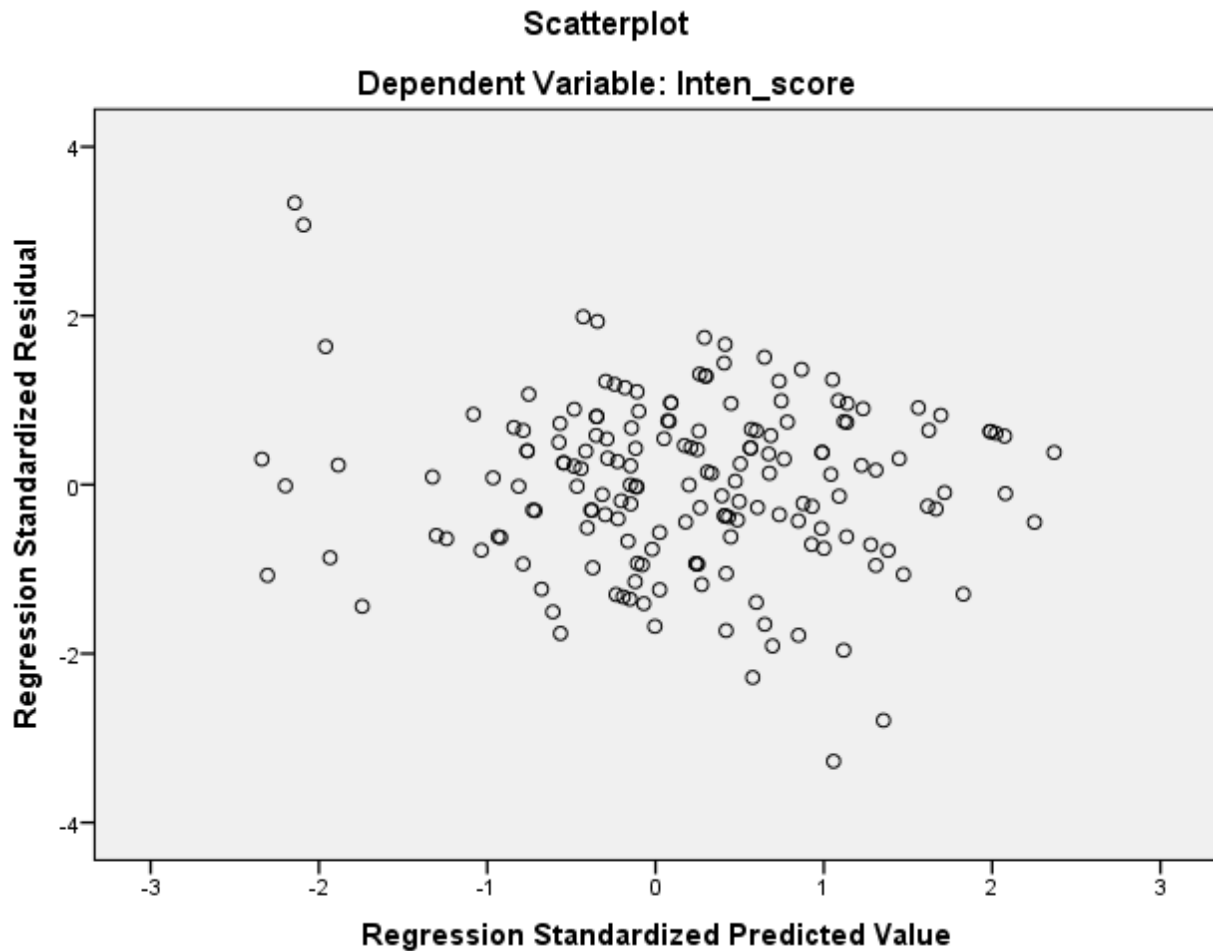
Figure 7.2: Scatterplot of standardised residuals against standardised predicted values

- Outliers: Casewise diagnostic (Table 7.5) indicated that there were three cases for which the residual's size exceeds 3. It was way less than 1% of the total cases. As indicated in Table 7.4, the cook's distance for each of the cases was less than 1 indicating that there were no influential cases that warrant exclusion from the analysis.

Table 7.4:   Descriptive statistics for Cook's distance

	N	Minimum	Maximum	Mean	Standard deviation
Cook's distance	175	0.00000	0.09409	0.0038814	0.00948786
Valid N cases	175				

Table 7.5:   Case wise diagnostics

Case number	Std. residual	Intention score	Predicted value	Residual
27	3.075	24.00	10.3771	13.62287
95	3.335	25.00	10.2243	14.77575
369	-3.274	5.00	19.5073	-14.50734

- Normally distributed residuals: The histogram (Figure 7.3) and as well as the normal P-P (Figure 7.4) plot of regression standardised residuals of the dependent variable showed that the residuals were normally distributed.
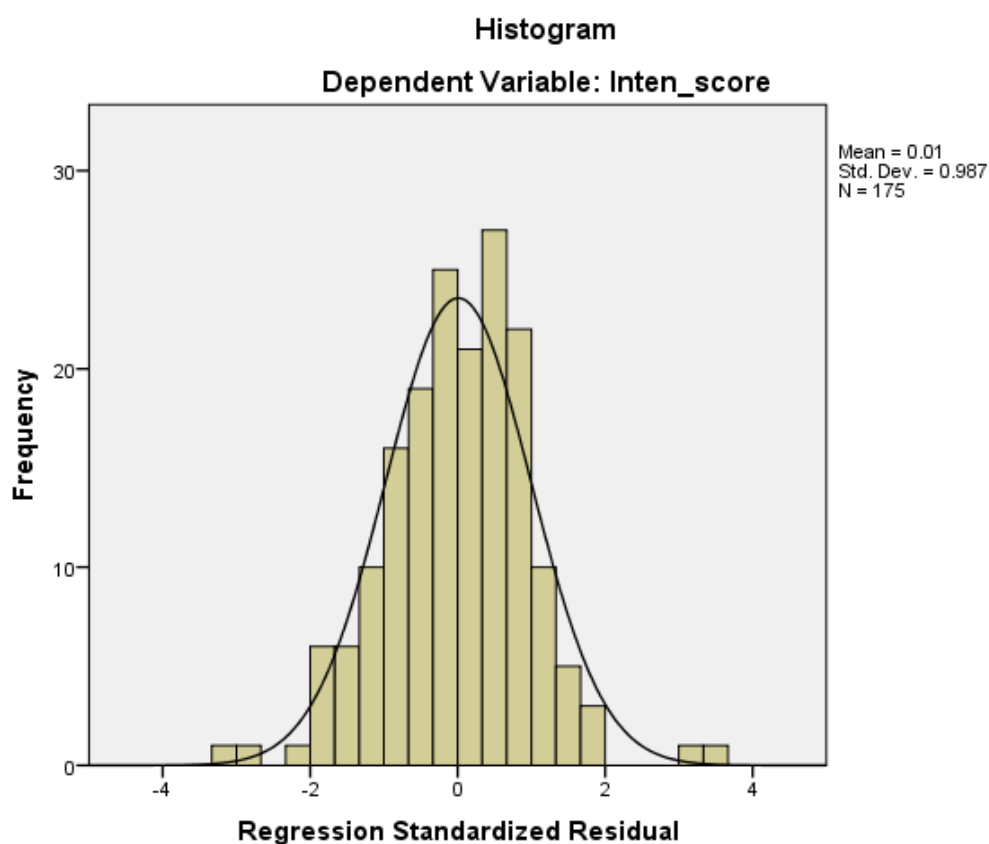
Figure 7.3: Histogram of standardised model residuals

Normal P-P Plot of Regression Standardized Residual
Dependent Variable: Inten_score
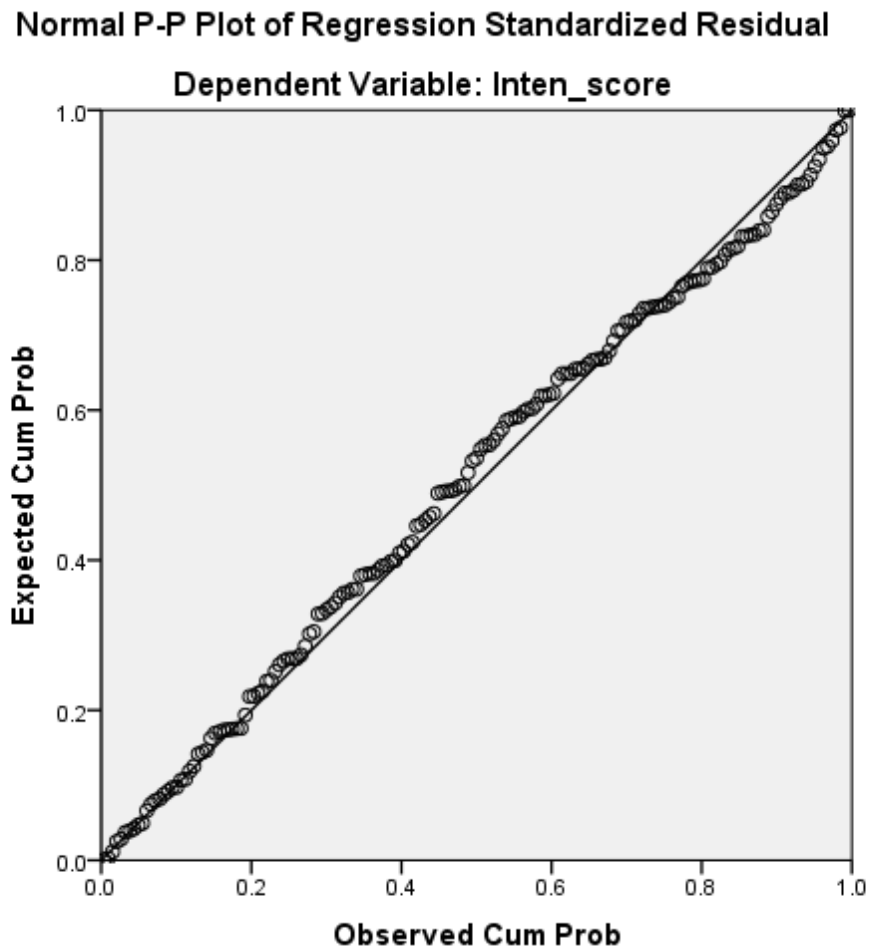
Figure 7.4: P-P plot of standardised model residuals

- Multicollinearity: Multicollinearity exists when two or more of the explanatory variables are highly correlated. Part and partial correlation table indicated that there was no correlations between any pair of explanatory variables which was greater than 0.80 indicating the absence of Multicollinearity. As indicated in Table 7.6, the value for the Tolerance was greater than 0.10 and the value of the VIF was less than 10 for each explanatory variable, further more suggesting that there was no cause for concern.

The regression model that included socio-demographic variables, knowledge about HIV/AIDS and the six constructs of the HBM predicted 31% of the variance in HIV testing intention ($F=7.683$, $df=17$, $p=0.000$). The coefficients for the explanatory variables were presented in Table 7.6.

Table 7.6: Regression coefficients for the explanatory variables

Model		Unstandardised Coefficients		Standardised Coefficients	t	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	-.454	4.080		-.111	.911	-8.484	7.575		
	Age	.101	.165	.038	.612	.541	-.224	.426	.623	1.606
	Gender	.412	.549	.039	.750	.454	-.669	1.492	.864	1.157
	Amahara	-.050	.707	-.005	-.071	.944	-1.441	1.341	.533	1.876
	Tigirie	-.708	1.002	-.041	-.707	.480	-2.680	1.263	.694	1.442
	Others ethnc	.890	.990	.055	.899	.369	-1.058	2.837	.640	1.563
	Muslim	-1.372	1.056	-.066	-1.300	.195	-3.450	.705	.923	1.084
	Protestant	-.046	.976	-.003	-.047	.962	-1.966	1.874	.787	1.271
	Marital status	-1.185	1.195	-.054	-.992	.322	-3.536	1.166	.813	1.230
	Class year	-.607	.271	-.126	-2.241	.026	-1.139	-.074	.751	1.332
	Place of Growth	-.445	.550	-.043	-.810	.419	-1.528	.637	.866	1.154
	Know _score	-.068	.307	-.011	-.223	.824	-.672	.535	.934	1.071
	Suscpt_score	.046	.084	.031	.552	.581	-.119	.212	.771	1.298
	Sever_score	-.014	.071	-.011	-.200	.842	-.153	.125	.814	1.228
	Ben_score	.314	.079	.259	3.969	.000	.158	.470	.563	1.777
	Bar_score	-.061	.037	-.085	-1.620	.106	-.134	.013	.869	1.150
	Effic_score	.244	.091	.170	2.674	.008	.064	.423	.594	1.683
	Cue_score	.722	.123	.293	5.849	.000	.479	.964	.950	1.052

Gender (1.Male, 0- Female), Ethnicity (Oromo was taken as reference group), Religion (Orthodox was taken as a reference group), Marital status (0-Single, 1-Others)

As can be seen from Table 7.6, socio-demographic variables couldn't predict HIV testing intention and were not statistically significant except for class year. In contrast, class year was a significant predictor of HIV testing intention. Students of higher class year were 0.607 lower on the HIV testing intention scale (p=0.026) when the effect of other socio-demographic variables, Knowledge about HIV/AIDS and the six constructs of HBM were controlled.

Comprehensive knowledge about HIV/AIDS was not a significant predictor of HIV testing intention when the effects of the other variables were controlled for.

Among the six constructs of the HBM, only three (perceived benefit of HIV testing, perceived self-efficacy regarding HIV testing and cues to action) were significant

predictors of HIV testing intention when the effects of the other variables were controlled for.

It was found that the perceived benefit of HIV testing was a significant predictor of HIV testing intention (p=0.000). For one point increase on the perceived benefit scale, there was a corresponding 0.314 points increase on HIV testing intention scale when controlling the effect of other variables.

Similarly, perceived self-efficacy also significantly predicted HIV testing intention. For a one point increase on the perceived self-efficacy scale, there was a corresponding 0.244 points increase on HIV testing intention scale (p=0.008) when controlling the effect of other variables.

Finally, it was found that cues to action also significantly predicted HIV testing intention. For one point increase on the cues to action scale, there was a corresponding 0.722 points increase on HIV testing intention scale (p=0.000) when controlling the effect of other variables.

Prediction of recent history of HIV testing using binary logistic regression

Binary logistic regression was run using SPSS version 20 in order to check if recent history of HIV testing among university students could be predicted by socio-demographic variables, Knowledge about HIV/AIDS and the six constructs of HBM.

Omnibus test of model coefficients indicated that the model was a good predictor (Chi-square value=45.098, df=20, p=0.001). The model summary indicated that 32.4% of the variance in the recent history of HIV testing was explained by the explanatory variables (Nagelkerke R square=0.324)

Hosmer-Lemeshow goodness-of-fit test was non-significant indicating that the model has good fit (chi-square=3.504, df=8, p=0.899).

The Classification table indicated that the model can predict 72.6% of the outcome variable correctly compared to the null model that can predict 59.1% of the outcome variable correctly.

As indicated in Table 7.7, only two variables (cues to action and marital status) were significant predictors of recent HIV testing history. Students who have been in the category of married or divorced or widowed were 37 times more likely to have recent history of HIV testing when the effect of other variables were controlled for. Students who were one point more on their cues to action scale were 1.5 times more likely to have recent history of HIV testing controlling for the effect of other variables.

Table 7.7: Regression coefficients

		B	S.E.	Wald	df	Sig.	Exp (B)	95% C.I. for EXP (B)	
								Lower	Upper
On Step 1[a]	Age	-.178	.112	2.515	1	.113	.837	.672	1.043
	Ethnicity			2.824	3	.420			
	Ethnicity (1)	.000	.580	.000	1	.999	1.000	.321	3.119
	Ethnicity (2)	-1.449	1.004	2.086	1	.149	.235	.033	1.678
	Ethnicity (3)	-.058	.693	.007	1	.933	.944	.243	3.670
	Class_year			5.531	3	.137			
	Class_year (1)	-.036	.509	.005	1	.944	.965	.356	2.616
	Class_year (2)	1.078	.579	3.463	1	.063	2.939	.944	9.146
	Class_year (3)	1.061	.974	1.185	1	.276	2.889	.428	19.503
	Marital_dummy	3.629	1.326	7.489	1	.006	37.687	2.801	507.051
	New_growth	-.004	.428	.000	1	.993	.996	.430	2.307
	New_gender	-.430	.441	.950	1	.330	.651	.274	1.544
	Know_score	-.084	.246	.116	1	.734	.920	.568	1.489
	Suscpt_score	.011	.073	.021	1	.884	1.011	.876	1.166
	Sever_score	.016	.056	.079	1	.779	1.016	.910	1.134
	Ben_score	-.115	.078	2.169	1	.141	.891	.764	1.039
	Bar_score	-.017	.030	.340	1	.560	.983	.927	1.042
	Effic_score	.075	.080	.892	1	.345	1.078	.922	1.260
	Cue_score	.410	.104	15.507	1	.000	1.506	1.228	1.847
	Inten_score	.063	.047	1.821	1	.177	1.065	.972	1.168
	New_religion			2.160	2	.340			
	New_religion (1)	-.784	.830	.891	1	.345	.457	.090	2.325
	New_religion (2)	.745	.731	1.041	1	.308	2.107	.503	8.825
	Constant	.612	3.368	.033	1	.856	1.844		

a. Variable (s) entered on step 1: Age, Ethnicity, Class_year, Marital_dummy, New_growth, New_gender, Know_score, Suscpt_score, Sever_score, Ben_score, Bar_score, Effic_score, Cue_score, Inten_score, New_religion.

7.4   INTERPRETATION OF THE SURVEY FINDINGS

In this section, interpretation and discussions of the findings of the cross-sectional survey on the prediction of HIV testing intention and recent history of HIV testing among university students was presented.

7.4.1   Socio-demographic variables as a predictor of HIV testing intention

As indicated in the results section above, bivariate analysis indicated that among socio-demographic variables, only age and class year of students were significantly associated with HIV testing intention. However, in multivariate analysis, only class year was a significant predictor of HIV testing intention.   The remaining socio-demographic variables were not associated with HIV testing intention in both bivariate and multivariate analysis.

The finding that lack of association between various demographic variables and HIV testing intention was consistent with other studies except for class year which is consistent with the current study. For example, Abamecha et al (2013) found that none of the socio-demographic variables were significantly associated with the intention to use VCT. The same findings were reported by Pikard (2009) and Westmaas, Kok, Vriens, Götz, Richardus and Voeten (2012). However, there were few studies that have reported that HIV testing intention was associated with some demographic variables for example age, marital status (Asante 2013; Meadows, Gazzard & Catalan 1993; Amadi 2012).

It seems that the lack of association between most of the socio-demographic variables with HIV test intention could be attributed to the fact that information about HIV/AIDS is no more different among various socio-demographic variables as also confirmed with the current study that knowledge about HIV/AIDS was consistently high among all groups of socio-demographic factors. The other reason could be because of the relatively homogenous nature of the study population (i.e. university students) that had probably resulted in lack of difference in terms of HIV testing intention across most of the socio-demographic factors.

7.4.2 Knowledge as a predictor of HIV testing intention

In the current analysis of the data, the level of knowledge about HIV/AIDS was not associated with HIV testing intention among university students as opposed to the findings of many studies conducted in this regard showing favourable association (Espinoza, Bird, Garcia, D'Anna, Bellamy & Scolari 2010; Britt, Lilia, Mara, Melawhy, Hoyt, Laura & Rosana 2010; Meadows et al 1993).

This can be due to the fact that the current HIV/AIDS knowledge level is one of the highest as confirmed by this study too. This study has also confirmed that the level of knowledge about HIV/AIDS was not significantly different across various socio-demographic variables including age, gender, ethnicity, religion and marital status. This could suggest the fact that knowledge may be no more an issue in predicting HIV/AIDS related behavioural intentions or practices given many years of health education and work on HIV/AIDS resulting in high level of knowledge across most of groups. The other reason could be because of being a university student in its own is a favourable condition to have good knowledge over many issues including HIV/AIDS that couldn't affect the level of HIV testing intention.

7.4.3 HBM constructs as a predictor of HIV testing intention

Bivariate analysis indicated that there was significant positive relationship between perceived susceptibility to HIV/AIDS and HIV testing intentions. However, this relationship was not supported by multivariate analysis. Multiple linear regression analysis has found that perceived susceptibility was not a significant predictor of HIV testing intention as opposed to many research findings that supported the relationship (Omer & Haidar 2010; Mancini & Foà 2013; Mancini & Foà 2013; Tenkorang 2013; Jani et al 2013; Broersma & Jansen 2012; Grover & Miller 2014; Nyembezia, Ruiterb, Bornec, Sifundaa, Funania & Reddy 2013; Moges & Amberbir 2011; Georges, Marie-Pierre, David, Fernand & Michel 2015).

The finding in the current research was consistent with some research findings regarding the lack of relationship between AIDS protective behaviours and perceived susceptibility (Hounton et al 2005; Mahoney, Thombs & Ford 1995; Steers et al 1996; Hounton et al 2005; Volk & Koopman 2001).

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Champion and Skinner (2008:58) attribute the inconsistencies in the findings of these researches partly to the use of inconsistent measurements. Ronis (1992) advises that susceptibility questions should be clearly framed in such a way that it show conditional on action or inaction. The finding in the current study was not attributed to this as the investigator has correctly framed the perceived susceptibility items as per the recommendation.

Similarly, bivariate analysis indicated that there was a significant positive relationship between perceived severity of HIV/AIDS and HIV testing intentions even though perceived severity was not a significant predictor of HIV testing intention in multivariate analysis. Contrasted with the current study, one study has found that perceived severity was associated with HIV testing intention (Jani et al 2013). Most studies have not included measures of perceived severity thinking that everyone reports HIV/AIDS as a severe disease (Rosenstock et al 1994) and which created difficulty to discuss the finding in the current study. Similarly, in the current study, the level of perceived severity was high on the scale with mean value of 19.7 and with minimum and maximum value of 5 and 25 respectively which was consistent with the usual findings (Rosenstock et al 1994).

In the current study, Pearson product moment correlation coefficient analysis showed that there was a significant positive correlation between perceived benefit of HIV testing and HIV testing intentions. Multivariate analysis by multiple linear regression also confirmed that it was a significant predictor of HIV testing intention. Research results about the relationship between perceived benefit of preventive actions about HIV/AIDS and actually engaging in health behaviours are not conclusive and some studies are suggesting that there was no significant relationship between them (Wulfert, Wan & Backus 1996).

However, several studies have demonstrated that perceived benefit of HIV testing was a significant predictor of HIV testing intention which was consistent with the current study (Westmaas et al 2012; Jani et al 2013; Myers, Orr & Locker & Jackson [Sa]; Meadows et al 1993; Asare & Sharma 2012; Moges & Amberbir 2011).

As indicated in the result section, bivariate analysis showed that there was a significant negative correlation between perceived barriers towards HIV testing and HIV testing intentions. However, it was not a significant predictor in multivariate analysis as indicated in the result section. In contrast, some studies were supporting the fact that perceived barrier was a significant predictor of HIV testing intention (Jani et al 2013; Moges & Amberbir 2011). This might be due to the fact that barriers that are related to utilisation of HIV testing services are currently decreasing and HIV testing facilities are easily accessible and hence it seems that barriers do not seem to predict HIV testing intention under the current circumstances in Ethiopia.

As indicated in the results section, bivariate analysis indicated that there was significant positive relationship between perceived self-efficacy related to HIV testing and HIV testing intentions. In congruent with this, multivariate analysis also demonstrated that perceived self-efficacy was a significant predictor of HIV testing intention.

The findings of the current study were consistent with findings from other studies (Omer & Haidar 2010; Kanu & Kanu 2000; Åstrøm & Nasir 2009; Assefa & Haidar 2013; Moges & Amberbir 2011; Georges et al 2015).

Bivariate analysis indicated that there was significant positive relationship between cues to action (reminders for HIV testing) and HIV testing intentions which was also supported by multivariate analysis. Even though there were a limited number of studies that included measures of cues to action in the HBM as their conceptual framework, the current findings were consistent with findings from a couple of studies (Westmaas et al 2012; Asare & Sharma 2012).

7.4.4 Discussion on prediction of recent history of HIV testing

As indicated in the results section above, less than half of the students have reported that they had recent history of HIV testing in the past 12 months prior to the survey date.

The current level of recent history HIV of HIV testing of 45% is somehow similar with studies conducted among Debre Markos university students (58.5%) by Tsegay et al (2013) and among college students in Harari region (52.8%) by Dirar et al (2013) in Ethiopia. However, it was very high compared to EDHS survey finding which was only

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21% of women and 20% of men aged 15–24 years in school and out of school population have received an HIV test and know their results in the year preceding the survey (Central Statistical Agency [CSA] & ICF International 2011). The level of HIV testing in the current study was also not very much different from other African countries. A study conducted among Kenyan university students found that 38.5% of the subjects had tested for HIV in the last 12 months (Mwangi, Ngure, Thiga & Ngure 2014). On the other hand, review of studies conducted in ten Southern African countries indicated that HIV testing in the past 12 months varied from 24% in Mozambique to 64% in Botswana (Mitchell, Cockcroft, Lamothe & Andersson 2010).

The following sections discuss and interpret the different factors that predicted recent history of HIV testing in the currentt study.

7.4.4.1 *Socio-demographic variables as a predictor of recent history of HIV testing history*

As indicated in the results section, a bivariate analysis indicated that recent history of HIV testing was only associated with ethnicity and the rest socio-demographic variables (age, gender, religion, marital status, class year and origin of growth (rural versus urban) were not associated with recent history of HIV testing. In multivariate logistic regression only marital status was a predictor of HIV testing whereby students in other marital status category (married or divorced or widowed) were more likely to get tested for HIV in the past 12 months preceding the survey compared to students who were single.

Some studies conducted outside Ethiopia indicated that different socio-demographic variables predicted recent history HIV testing history. For example, a study conducted among Latin-American migrants and Spaniards indicated that Spaniards were more likely to report no previous testing than Latin-Americans (Hoyos, Fernández-Balbuena, De la Fuente, Sordo, Ruiz, Barrio & Belza 2013). In concordance with this, Ntsepea, Simbayib, Shisanac, Rehled, Mabasoe, Ncitakalo, Davidsg and Naidooh (2014) found that participants from both African and Indian FGs reported being less likely to do self-initiated HIV testing and counselling, while those from the FG consisting of young whites were more likely to learn about their HIV status through blood donations and campus HIV testing campaigns.

Moreover, a study on sexual-risk behaviour and HIV testing among Canadian snowbirds who winter in Florida indicated that the odds of testing were increased for the unmarried and those aged 50–64 (Mairs & Bullock 2013). In the same fashion, another study conducted among university students elsewhere showed that younger, heterosexual students were significantly less likely to be tested for HIV (Cragg 2014). More studies were supporting the fact that older ages and higher education level were associated with the likely of having HIV testing done (Hart, Williamson, Flowers, Frankis & Der 2002; Mhlongo, Dietrich, Otwombe, Robertson, Coates & Gray 2013; Burns, Fenton, Morison, Mercer, Erens, Field, Copas, Wellings & Johnson 2005).

The lack of association between most of the socio-demographic variables with recent history of HIV testing can be explained by the same reasons explained above for HIV testing intention.

The presence of significant association between recent history of HIV testing and marital status seems logical because of the fact that HIV testing is becoming a precondition for most people before marriage leading to high chance of having HIV testing and also because of the clear presence of sexual activities among married, separated and widowed individuals which can also lead to having an HIV test.

The cross-sectional design followed in this study might make it difficult to clearly identify which socio-demographic variables predict HIV testing behaviour as the HIV testing had already occurred even though some of the socio-demographic variables were not changing over time (e.g. gender) or had little over time changes (e.g. education status, marital status).

7.4.4.2 *Knowledge about HIV/AIDS as a predictor of recent history of HIV testing*

As indicated in the result section, a bivariate analysis indicated that there was no significant relationship between level of knowledge about HIV/AIDS and recent history of HIV testing. There were limited number of studies that analysed the relationship between knowledge about HIV/AIDS and recent history of HIV testing. However, some studies revealed that knowledge about HIV/AIDS predicted recent history of HIV testing (Haile 2011; Asante 2013).

The lack of association between knowledge about HIV/AIDS and recent history of HIV testing in the current study can be explained by the fact that knowledge about HIV/AIDS by itself is not a sufficient condition to change behaviour. Moreover, knowledge about HIV/AIDS is consistently high among different socio-demographic factors among university students indicating that other variables might have crucial role in predicting HIV testing practice than knowledge about HIV/AIDS.

7.4.4.3 HBM constructs as a predictor of recent history of HIV testing

A bivariate analysis using independent t-test indicated that there was no significance difference regarding the level of perceived susceptibility, perceived severity, perceived barrier and perceived self-efficacy between people who had recent history of HIV testing and people who didn't have. However, bivariate analysis indicated that there was significance difference in the level of perceived benefit and cues to action between people who had recent history of HIV testing and people who didn't have. On the other hand, multivariate analysis using binary logistic regression indicated that only cues to action emerged as a significant predictor of recent history of HIV testing from the six constructs of HBM.

There were a limited number of studies that analysed the relationship between HBM constructs and recent history of HIV testing. This might be due to the difficulty of comparing past history of HIV testing with HBM constructs in cross-sectional studies because of the difficulty related to temporal relationship between the dependent variable (recent history of HIV testing) and the independent variables (HBM constructs) resulting in the so called chicken-egg dilemma. And as a result researchers usually choose intentions for HIV testing as a proxy measure for HIV testing behaviour.

Contrary to the findings of the current study, Amadi (2012); Grover and Miller (2014); Myers et al [Sa]; Hoyos et al (2013) and Burns et al (2005) found that perceived susceptibility is a predictor of HIV testing.

Even though it was difficult to establish the relationship between recent history of HIV testing and perceived barrier by quantitative terms some studies have indicated that

fear of rejection, discrimination, desire for anonymity and denial were considered as barriers of not getting HIV testing (Hoyos et al 2013; Myers et al [Sa]).

The absence of significant association between HBM constructs except for cues to action and recent history of HIV testing might be attributed to various reasons. One of the reasons may be related to the design of the study that would create difficulty in knowing whether the HIV testing or the beliefs has occurred first. For example, recent history of HIV testing might have led an individual to believe that he/she was not susceptible to HIV/AIDS as compared to before he/she had the HIV test. She/he might also foresee few barriers after the HIV test. Moreover, one might believe that one would be more confident after having HIV testing and would be more self-efficacious after the HIV test. It is also possible that the level of perceived severity of HIV/AIDS and level of perceived benefit of HIV testing may change after the HIV test leading to a distorted association between the independent variables and dependent variables.

In summary, it is very difficult to rely on associations between HBM constructs in the context of the current study and recent history of HIV testing irrespective of the presence or absence of significance association with the dependent variable.

7.5   CONCULUSION

This chapter presented the analysis and interpretation of the findings of cross-sectional data collected on 612 randomly selected university students. The main objective of this chapter was to test the hypothesis dealing with the relationship of various socio-demographic variables and the six constructs of the HBM as measured by the final HTBS with the two key dependent variables under investigation (HIV testing intention and recent history of HIV testing).

Bivariate analysis indicated that age, class year and all the six constructs of HBM were significantly associated with HIV testing intention. However, multiple linear regression indicated that only class year, perceived benefit, perceived self-efficacy and cues to action were significant predictors of HIV testing intention.

In bivariate analysis, ethnicity and only two constructs of HBM (perceived benefit and cues to action) were significantly associated with recent history of HIV testing. However,

binary logistic regression indicated that only marital status and cues to action were significant predictors of recent history of HIV testing.

The next chapter summarises and discusses the overall findings of the survey on which conclusions and recommendations were drawn. It finally ends by presenting contributions and limitations of the study.

CHAPTER 8

CONCLUSIONS, RECMMENDATIONS AND LIMITATIONS OF THE STUDY

8.1   INTRODUCTION

The previous chapters mainly dealt with analysis and presentation of the findings related to item development, in-depth interview, content validity assessment, pilot study (EFA) and cross-sectional survey (CFA and further analysis). The first chapter presented the problem statement that motivated the conduct of the study, on the basis of which the objectives were crafted. The second chapter presented and discussed the topic under investigation in the context of current knowledge through review of literatures. The third chapter dealt with different methods required to address the research objectives comprehensively.   The remaining four chapters presented the key results and findings in the process of the development of HTBS (in-depth interview, content validity assessment by experts, surveys for exploratory factor analysis and confirmatory factor analysis) and analysis of main research objectives and key hypothesis by using data from cross-sectional survey.

In the current chapter, the findings of the research, which were presented in the previous chapters, are summarised in relation to the research questions asked, and specifically to the problem statement. Followed by this, conclusions are drawn regarding the key finding of the research. It also summarises practical implications and applications of the research findings in terms of recommendations. The chapter was concluded by presenting limitations of the study.

8.2   RESEARCH DESIGN AND METHOD

In this study, a mixed (qualitative followed by quantitative) study approach was employed in sequential way. The exploratory mixed method approach was used in three phases for this study. The first phase was an exploratory qualitative study that employed in-depth interview of university students in order to contribute to the development of items for HTBS item pool in addition to items generated from existing

literature. The finalised item pool was assessed for content validity by three experts before proceeding to the second phase. The second phase was a pilot study that was intended to finalise development of research instrument for the main study through exploratory factor analysis technique. The dominant and third phase of the study used a quantitative (cross-sectional survey) that enrolled randomly selected university students in order to (1) finalise HTBS using confirmatory factor analysis (a sub type of structural equation modeling) and (2) test the core research hypothesis and answer research questions.

8.3 SUMMARY AND INTERPRETATION OF THE RESEARCH FINDINGS

8.3.1 Summary and interpretation of in-depth interview findings

As indicated in Chapter 1, the purpose of the in-depth interviews was to identify new ideas in the Ethiopian context that were used in the development of items for HTBS. In the current section key in-depth interview findings are highlighted and were interpreted in the context of existing knowledge and investigator's opinion and understanding of the situation. The summarisation and interpretations of key findings of the in-depth interview were presented based on the six constructs of HBM.

8.3.1.1 *Perceived severity of HIV/AIDS*

Even though it was not customary to include perceived severity in studies utilising HBM, the investigator of the current study has explored it using in depth interview in order to have the fuller picture of the beliefs associated with HIV testing. Many of the in-depth interview participants held the belief that HIV/AIDS was a very serious disease. The in-depth interview participants expressed the severity of HIV/AIDS in terms of lack of cure and vaccine, fatality, physical and psychological infirmity, social and economic impacts and the need for life long care and management.

The following ideas, which were not identified during literature review, were drawn from the data obtained from in-depth interview analysis for development of two items for perceived severity construct:

- Economic impact of HIV/AIDS
- Psychosocial impact of HIV/AIDS

8.3.1.2   Perceived susceptibility to HIV/AIDS

Most of the in-depth interview participants felt that they had little or no exposure to HIV/AIDS. Those who believed having little exposure claimed exposure to sharp materials and other unnoticed circumstances other than sexual exposure.

The following ideas were noted for further development of items under perceived susceptibility construct:

- Feeling exposed to HIV/AIDS because of sharing sharp materials with others
- No HIV/AIDS sign and symptoms hence not susceptible to HIV/AIDS
- No sexual exposure hence not exposed to HIV/AIDS

8.3.1.3   Perceived benefit of HIV testing

Most of in-depth interview participants had the belief that HIV counseling and testing was beneficial for clearing out doubts regarding one's exposure and building confidence, planning one's future, protecting others, living a healthy life, identifying future partner, having early treatment before the disease becomes severe, and for advising others to get tested.

The following issues were identified from the analysis of the in-depth interview for development of new items for perceived:

- HIV testing help planning one's future life
- HIV testing help not transmit to other people without knowing one' s status
- HIV testing help to identify future partner
- HIV testing help to get early treatment and improve health

8.3.1.4 Perceived barrier towards HIV testing

The in-depth interviews revealed a wide range of perceived barriers related to personal, interpersonal and social (friends, family and community) and service provision aspects.

Personal factors that were hindering people from getting tested for HIV include: fear of HIV positive result, lack of time and opportunity, fear of uncertainty of one's future if incase positive, the belief that one is not in relationship and fear of pain related to needle pricking during testing process.

A number of factors related to peer, family and community were believed to be barriers to not getting tested by in-depth interview participants.

The following issues were considered for the development of items for perceived barriers:

- Afraid of hearing HIV positive result
- Concerned with confidentiality at health facilities
- Afraid of the pain because of needle pricks
- Afraid of contamination during HIV testing procedures
- Doubts regarding the accuracy of HIV test results

8.3.1.5 Perceived self-efficacy about HIV testing

Most of the in-depth interview participants knew where they can get HIV testing, however they were not confident enough on how they were going to handle the whole process of HIV testing. Most of the in-depth interview participants believe that they didn't know what they would do if they were HIV positive and indeed they would feel bad and sad about it. The same was true regarding what to do with negative HIV test results.

The following ideas were considered for development of new items for perceived self-efficacy:

- Don't know what to do with positive results
- Tell friends about my plan about HIV testing
- Remaining faithful to one's partner after negative result
- Continue proper use of condom after negative result

8.3.1.6 *Cues to action*

In-depth interview participants who had ever tested for HIV in their life time believed that the following conditions had triggered their testing: HIV testing campaign, friends or family tested for HIV, girlfriend tested for HIV, heard information from medias, asked to donate blood for relatives, part of anti-AIDS club and advised by school and, asked by friends for accompany for HIV testing.

The following concepts from the in-depth interviews were considered for the development of new items under cues to action:

- Heard or seen information advising for HIV testing in the media
- HIV testing promotion and campaign in the campus
- Friends tested for HIV
- Asked to get tested to donate blood

8.3.2 Summary and interpretation of content validity assessment

The objective of item review (content validity assessment) was to confirm that the item written for the instrument adequately represented the constructs and do revisions based on recommendations of the experts. The review was done by three experts. The experts were asked to make judgments on the relevance of each item with regards to the constructs under each component of HBM using a relevance rating four-point Likert scale and also experts were asked to suggest revisions, including addition or deletion of items.

CVI was calculated for the three experts based on the percentage of items rated 3 or 4 from all the items and average percentage was calculated for the three experts. The first content expert rated 93.4% (57 items from 61 items) as either 3 or 4. The second

content expert rated 90.1% (55 items from 61 items) as either 3 or 4. And the third expert also rated 90.1% (55 items from 61 items) as either 3 or 4. The CVI for the total scale is calculated as the average of the three experts which is 91.2%, which is greater than the cut of point as per Waltz et al (1991) recommendation of at least 90% CVI.

One item was deleted because of irrelevance and four extra items were added based on the experts' comments to split some of the items and addition of extra items. Finally, the item pool contained a total of 64 items which was used for the piloting study.

8.3.3 Summary and interpretation of pilot study (exploratory factor analysis) findings

The purpose of the pilot study was to test the hypothesis that exploratory factor analysis does not produce a six factor sub-scales, which was developed through literature review and in-depth interview and finally which underwent content validity assessment by experts, with at least three items under each sub-scale with a factor loading of 0.40 or greater.

Fifty-nine items representing the six constructs (perceived susceptibility=9, perceived severity=7, perceived benefit=7, perceived barrier=18, perceived self-efficacy=10 and cues to action=8) of HIV testing Belief Scale (HTBS) were included in the internal consistency analysis and EFA. Five items dealing with HIV testing intention (dependent variable for the study) were also analysed for reliability and consistency.

Initial analysis indicated that the internal consistency (Cronbach's alpha) for each of the six subscales fallen in the range of 0.557-0.864. Perceived susceptibility and perceived severity had Cronbach's alpha values of 0.557 and 0.644 respectively which was below 0.70 and was not adequate. The remaining constructs demonstrated an alpha value of higher than 0.7. Further removal of some items from all the six constructs of HBM improved the value of Cronbach's alpha beyond 0.70 for all the constructs. Moreover, the Cronbach's alpha for HIV testing intention construct was 0.89 which is greater than the cut of point of 0.70.

The basic requirements for EFA were met. Initial extraction analysis identified 12 factors with Eigenvalues greater than 1 which were ranging from 1.021 to 8.935 and the 12 factors explained 54.5% of the variance.

After eight repeated EFA, factors set at five demonstrated clearer factor structure and strong items and the five factors explained 48.1% of the a total variance. Factors were named based on the predetermined HBM constructs depending on the type of items that loaded together. Five constructs of the HBM clearly appeared in the structure matrix with items that had a factor loading of ≥0.50 and only perceived susceptibility did not clearly appear in the structure. The original HTBS with 64 items under the six components of the HBM, after undergoing EFA and reliability analysis, was reduced to HTBS with 39 items. All the items retained had a factor loading of 0.40 or greater.

After EFA analysis, the draft HTBS consisted of 4 items under perceived susceptibility, 5 items under perceived severity, 6 items under perceived benefit, 9 items under perceived barrier, 5 items under perceived self-efficacy, and 5 items under cues to action. The Cronbach's alpha improved to beyond 0.70 for all the constructs.

8.3.4 Summary and interpretation of structural equation modeling: Confirmatory factor analysis

The purpose of the SEM-CFA was to test the hypothesis that measurement model of the SEM doesn't confirm the fact that the proposed seven sub-scales in the HTBS don't fit a sample data.

Thirty-nine items representing the six constructs (perceived susceptibility=5, perceived severity=7, perceived benefit=6, perceived barrier=10, perceived self-efficacy=5 and cues to action=6) of HIV testing Belief Scale (HTBS) that were retained through EFA were analysed using CFA method separately. Five items dealing with HIV testing intention (dependent variable for the study) were also analysed by CFA.

CFA was run using computer software called LISREL 9.2. Basic assumptions for the analysis of CFA were met. The confirmatory factor models for each of the seven latent variables that contained specified observed variables (items) were specified. The seven CFA models were identified; for all the seven CFA models specified, it was confirmed

that the factor loading of each of the items on its respective factor were identified or could be estimated.

The confirmatory model for this study was analysed using GLS with a standardised solution to report the statistical estimates of the free parameters. Testing of the initial seven CFA models separately indicated that the chi-square values were significant for all the seven CFA initial models indicating that the proposed models were different from the estimated ones from the data. This could be attributed to partly large sample size. Moreover, the RMSEA values exceeded the cut of point of less than 0.08 for all the CFA models except for HIV testing intention still indicating bad fit. However, the GFI (criterion ≥0.90) was met by four of the CFA models except for three CFA models: perceived severity, perceived barrier, and perceived self-efficacy.

To improve the model fit, CFA model modifications have been made based on standard residuals and the modification indices in addition to statistical significance of each parameter, magnitude and directions of the parameters, and model fit indices for each of the sub-scale generated using Lisrel 9.2.

After modification of the seven CFA models, the chi-square values were not significant for the four CFA modified models (perceived susceptibility, perceived benefit, perceived self-efficacy and HIV testing intentions) indicating that the proposed models fitted the data. However, chi-square value was significant for three of the CFA modified models (perceived severity, perceived barrier and cues to action) indicating that the proposed models didn't fit the data. However, the RMSEA values were less than 0.08 for all the seven modified models supporting the fact that the models fitted the data. Moreover, the GFI (criterion ≥0.90) was met by all the seven modified of the CFA models again supporting goodness of fit.

In summary, based on the final seven models, the factor loading was inspected for all the items under each modified models. Inspection of factor loading for the 44 items in the final seven modified models demonstrated that factor loading ranges from 0.07 to 0.87.All items except five items (1 under perceived susceptibility, 2 under perceived severity and 2 under cues to action) demonstrated a factor loading of >0.40.

The final HTBS contained only 39 items (4 under perceived susceptibility, 5 under perceived severity, 6 under perceived benefit, 10 under perceived barrier, 5 under perceived self-efficacy, 4 under cues to action, and 5 under HIV testing intention)

Analysis of reliability using Cronbach's alpha of the final HTBS indicated that it was >0.70 for all the sub-scales except for perceived susceptibility (0.594) and cues to action (0.597) which didn't meet the criteria.

8.3.5 Summary and interpretation of cross-sectional survey findings

In this section, interpretation of the findings of the cross-sectional survey on the prediction of HIV testing intention and recent history of HIV testing among university students is presented.

As it was noted in the previous chapter, the main objective of the analysis of the cross-sectional survey data was to test the hypothesis that socio-demographic variables, knowledge about HIV/AIDS and the six constructs of HBM were not associated with HIV testing intention and recent history of HIV testing.

8.3.5.1 *Socio-demographic variables as a predictor of HIV testing intention*

As indicated in the result section above, bivariate analysis indicated that among socio-demographic variables, only age and class year of students were significantly associated with HIV testing intention. However, in multivariate analysis, only class year was a significant predictor of HIV testing intention.   The rest socio-demographic variables were not associated with HIV testing intention in both bivariate and multivariate analysis.

8.3.5.2 *Knowledge as a predictor of HIV testing intention*

In the current analysis of the data, the level of knowledge about HIV/AIDS was not associated with HIV testing intention among university students as opposed to the findings of many studies conducted in this regard showing favourable association.

8.3.5.3   *HBM constructs as a predictor of HIV testing intention*

Multivariate analysis indicated that there was not a significant predictor of HIV testing intention as opposed to many research findings that supported the relationship. However, the finding in the current research was consistent with only few researches findings.

Multivariate analysis indicated that perceived severity was not a significant predictor of HIV testing intention. Most studies have not included measures of perceived severity thinking that everyone reports HIV/AIDS as a severe disease.

In the current study, both Pearson product moment correlation coefficient and multivariate analysis showed that there was a significant positive correlation between perceived benefit of HIV testing and HIV testing intentions. Research results about the relationship between perceived benefit of preventive actions about HIV/AIDS and actually engaging in health behaviours are not conclusive.

In multivariate analysis, perceived barrier was not a significant predictor of HIV testing intention. In contrast, some studies were supporting the fact that perceived barrier was a significant predictor of HIV testing intention.

In congruent with bivariate analysis, multivariate analysis demonstrated that perceived self-efficacy was a significant predictor of HIV testing intention. The finding of the current study was consistent with findings from other studies.

Bivariate analysis indicated that there was significant positive relationship between cues to action (reminders for HIV testing) and HIV testing intentions which was also supported by multivariate analysis. Even though there was a limited number of studies that included measures of cues to action in the HBM as their conceptual framework, the current findings were consistent with finding from a couple of studies.

8.3.5.4 Socio-demographic variables as a predictor of recent history of HIV testing history

In multivariate logistic regression only marital status was a predictor of recent history of HIV testing whereby students in other marital status category (married or divorced or widowed) were more likely to get tested for HIV in the past 12 months preceding the survey compared to students who were single.

8.3.5.5 Knowledge about HIV/AIDS as a predictor of recent history of HIV testing

Both bivariate and multivariate analysis indicated that there was no significant relationship between level of knowledge about HIV/AIDS and recent history of HIV testing. There is a limited number of studies that analysed the relationship between knowledge about HIV/AIDS and recent history of HIV testing.

8.3.5.6 HBM constructs as a predictor of recent history of HIV testing

As indicated in chapter 7, only less than half of the students have reported that they had recent history of HIV testing in the past 12 months from the survey date.

The current level of recent history of HIV testing is comparable with studies conducted in Ethiopia among college and university students. However, it was very high compared to EDHS survey finding among young people aged 15–24 years. The level of HIV testing in the current study was also not very much different from other African countries.

A bivariate analysis using independent t-test indicated that there was no significant difference regarding the level of perceived susceptibility, perceived severity, perceived barrier and perceived self-efficacy between people who had recent history of HIV testing and people who didn't have. However, bivariate analysis indicated that there was significance difference in the level of perceived benefit and cues to action between people who had recent history of HIV testing and people who didn't have. On the other hand, multivariate analysis using binary logistic regression indicated that only cues to action emerged as a significant predictor of recent history of HIV testing from the six constructs of HBM. It was very difficult to rely on associations between HBM constructs

in the context of the current study and recent history of HIV testing irrespective of the presence or absence of significance association with the dependent variable.

There was a limited number of studies that analysed the relationship between HBM constructs and recent history of HIV testing.

8.4 CONCULUSIONS

The following conclusions were drawn from the findings of the different phases of the study and have served as a basis on which further recommendations were suggested.

8.4.1 In-depth interviews

The in-depth interview analysis found that most of the in-depth interview participants had a belief that HIV/AIDS was a very serious disease. Most of them didn't consider themselves as susceptible to HIV/AIDS other than insignificant exposure which was attributed to accidental contact with sharp materials and unnoticed exposure to body fluids during interpersonal contacts even though more than average level of perceived susceptibility was revealed among most of the participants in quantitative survey.

Most of the in-depth interview participants believed that HIV testing has enormous benefit in terms of clearing out doubts regarding one's exposure, planning one's future and in order to live a healthy life and get early diagnosis and treatment. However, a wide range of personal, social and health system barriers were mentioned by most of the participants that might hinder their HIV testing intentions.

Most of the in-depth interview participants believed that they were not confident enough on how they were going to handle the whole process of HIV testing and HIV test outcomes which indicate low perceived self-efficacy.

Among in-depth interview participants who had tested for HIV, most of them believed that their HIV testing was triggered by HIV testing campaign, because their friends or family member were tested for HIV, their girlfriends were tested for HIV, information from medias, they were asked to donate blood for relatives, were a member of anti-AIDS club and advised by school and asked by friends to accompany for HIV testing.

In summary, 23 items were written from the results of the in-depth interview and were incorporated in the item pool for the development of HTBS.

8.4.2 Item pool development and content validity assessment

Sixty-one items were generated and developed from literature review and in-depth interview and which latter undergone content validity assessment by three experts that resulted in 64 items ready for piloting.

8.4.3 Pilot study: Exploratory factor analysis

In exploratory factor analysis, all the six factors except perceived susceptibility emerged which was roughly consistent with the six constructs of HBM. The original HTBS with 59 items was reduced to HTBS with 39 items with factor loading >0.40.The reliability of HIV testing intention with the five items was analysed separately. The reliability analysis of the final HTBS with 44 items indicated that perceived benefit of HIV testing, perceived barrier towards HIV testing, perceived self-efficacy and cues to action demonstrated a strong reliability. However perceived severity and susceptibility demonstrated relatively lower reliability.

8.4.4 Confirmatory factor analysis

The chi-square test analysis for the seven modified CFA models indicated that the four CFA models (perceived susceptibility, perceived benefit, perceived self-efficacy and HIV testing intentions) fitted the data. However, the remaining three of the CFA modified models (perceived severity, perceived barrier and cues to action) did not fit the data.

However, the RMSEA values (criteria <0.08) and GFI (criterion ≥0.90) were met for all the seven modified models supporting the fact that the models fitted the data. Inspection of factor loading for the 44 items in the final seven modified models demonstrated that factor loading ranges from 0.07 to 0.87. All items except five items (1 under perceived susceptibility, 2 under perceived severity and 2 under cues to action) demonstrated a factor loading of >0.40.After removing the five items, the final HTBS contained only 39 items.

Analysis of reliability using Cronbach's alpha of the final HTBS with 39 items indicated that it was >0.70 for all the sub-scales except for perceived susceptibility (0.594) and cues to action (0.597) which did not meet the criteria.

8.4.5 Analysis of HIV testing intention and recent history of HIV testing

Bivariate analysis indicated that age, class year and all the six constructs of HBM were significantly associated with HIV testing intentions. However, multiple linear regression indicated that only class year, perceived benefit, perceived self-efficacy and cues to action were significant predictors of HIV testing intention.

In bivariate analysis, ethnicity and only two constructs of HBM (perceived benefit and cues to action) were significantly associated with recent history of HIV testing. However, binary logistic regression indicated that only marital status and cues to action were significant predictors of recent history of HIV testing.

8.5 RECOMMENDATIONS

The follow recommendations were drawn based on findings of this study:
Areas for future research:

- The findings of the current study was limited to university students therefore it is advisable to have a more comprehensive study that will represent the young people in all walks of life including but not limited to in school, out of school, rural and urban settings among others.
- The investigator recommends that the current HIV testing belief scale (HTBS) developed in this study needs to be validated using other studies on the same population or different population in order to improve its validity and reliability for further use.
- Since it is difficult to establish the relationship between the independent variables and dependent variables using a cross-sectional survey, it is advisable to have a prospective study design such as a cohort or experimental ones in order to address the limitations of using cross-sectional survey.
- Perceived self-efficacy and cues to action were significantly associated with HIV testing intention. Moreover, 'cues to action' was the single predictor of recent HIV

testing history. Most studies overlooks perceived self-efficacy and cues to action as part of HBM constructs. Therefore, the investigator of this study strongly recommends including these constructs in all HBM related studies and further investigate the role of these constructs compared to other constructs in the HBM.

- The reliability of perceived susceptibility and 'cues to action' sub-scales did not meet the expected requirement of Cronbach's alpha of >0.70. Therefore, the investigator of this study recommends further inclusion of additional items and thereby validation study to come up with more reliable items under these constructs.

Areas for programmatic improvement:

- The investigator recommends that health education and behavioural change interventions for university students and young people may be designed in such a way that it would emphasise on demonstrating the perceived benefit of HIV testing.

- It is also advisable to focus on behavioural change messages that focus on improving the skill and confidence of university students and young people in dealing with process of HIV testing and HIV test results with the objective of improving the self-efficacy of the young people.

- It is also advisable to emphasise matters that would remind and motivate the young people and further trigger the acceptance of HIV testing in order to improve HIV testing intentions and behaviour among young people.

8.6   CONTRIBUTIONS OF THE STUDY

The current study has contributed to the existing knowledge gap regarding the availability of standardised HBM scale for measuring and predicting HIV testing intentions and behaviour in Ethiopian context by developing HIV testing belief scale (HTBS) with 39 items that will measure the six constructs of HBM and HIV testing intention especially among young people.

Secondly, the current study has narrowed the knowledge gap regarding factors that can predict HIV testing intention and behaviour among young people which can roughly be generalised for other Sub Saharan African countries in similar context with Ethiopia.

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Finally, as opposed to many studies, the current study has included all the six constructs of HBM and has found that perceived self-efficacy and cues to action which were usually missing in other studies were significant predictors of HIV testing intention affirming the importance of including these two constructs in future studies that will utilise HBM.

8.7 LIMITATIONS OF THE STUDY

The current study was not conducted without limitations, even though every effort has been made in order to minimise the limitations. The following points outline and discuss the limitations related to the current study.

- Because of the nature of the study design, the study subjects for the qualitative component (in-depth interview) of the study was selected purposively and it was limited to university students. Hence it was difficult to generalise items drawn from the in-depth interview to especially young people out of school.

- The in-depth interviews were conducted among Addis Ababa university students where many studies were being conducted which may be leading to interviewees' fatigue that might affect the findings of the in-depth interview in the current study. This also could apply for the pilot survey which was conducted in Addis Ababa University.

- It is difficult to exclude the possibility of social desirability bias especially in the case of face to face in-depth interview which increases the chance of answering more desirable responses.

- The EFA has produced a five factor model which corresponded with the five constructs of HBM; and perceived susceptibility was missed in the matrix structure. The perceived susceptibility construct could not emerge in the matrix structure indicating less valid items for this construct.

- In the current study, test-re-test reliability assessment (administering the scale at two different points of time) was not done on the scale. This has created a knowledge gap regarding the stability or reliability of the scale over time.

- The current study has not compared the HTBS with any standard scales or against a benchmark test if at all it exists. This has created a challenge to know the criterion validity of the scale.

- The reliability coefficient of the perceived susceptibility and cues to action constructs was less than the expected standard.

- Since this is a cross-sectional survey, it was difficult to establish the relationship between the independent and dependent variables.

- The use of a self-administered questionnaire/scale might have introduced a bias that could be either over reporting or under reporting. This may also provide the opportunity for some students to provide fake answers or take it as a fun in some instances.

- Because of the use of self-administered questionnaire, missing records for some items were inevitable and this might introduce some sort of biases. Furthermore, this has somehow reduced the sample size from the original planned for the study even though this has been taken care of by including extra samples.

- The findings of the current study can only apply to university students in Ethiopia and other African countries in similar contexts. It is not generalisable to young people out of school and other population groups.

8.8   CONCLUDING REMARKS

The current study on the development of HTBS and application of HBM to predict HIV testing intention and behaviour has come up with an instrument or scale called HTBS that could further be used to measure and predict HIV testing intention among university students and young people in general. However, the investigator of this study strongly believes that the HTBS could further be improved and validated using various studies that could address the test-retest reliability, construct validity and criterion related validity of the scale.

Moreover the current study analysed the predictors of HIV testing intention and recent history of HIV testing using explanatory variables that were based on the six constructs of HBM, comprehensive knowledge about HIV and Aids and socio-demographic characteristics. In particular, the current study has shed light on the importance of including perceived self- efficacy and 'cues to action' (the two most over looked constructs in the HBM). It should be noted that the current study was based on cross-sectional survey design and hence interpretations of any results from this study should be viewed in such context.

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ANNEXURES

APPENDIX A: **In-depth interview guide English version**

AN IN-DEPTH INTERVIEW GUIDE FOR THE STUDY
"APPLICATION OF HEALTH BELIEF MODEL (HBM) TO PREDICT VOLUNTARY HIV TESTING BEHAVIOR AMONG UNIVERSITY STUDENTS IN ETHIOPIA"

It is an honor to invite you to participate in the in-depth interview and I appreciate your volunteering to commit your time to participate in this study. My name is Zelalem Mehari Alemayehu and I am a doctoral student at the University of South Africa in Pretoria. The completion of this study is a part of my educational program there. I am the principal researcher for this project.

The Health Belief Model is a model which examines the importance of certain factors in determining health behaviors. The in-depth interview is the first phase of the study meant to understand common beliefs and other important information among university students using the six components of the Health Belief Model.

The information that you are providing is extremely helpful for achieving the aim of this study and I kindly ask you to actively participate in the discussion. I would like to assure you that all the information you are providing is confidential and will be kept in a secure location. Your responses will not be linked to you in any way. Information obtained will be available only to the researcher and other people who are involved in the study.

There are no right and wrong answers in the interview. Your interview will be strictly confidential.

With your permission, I will record the interview for further analysis and understanding of the interview in order to answer some of crucial research questions in this study.

We respect your right to withdraw from the interview at any time if you want to do so. You may do so without any consequences whatsoever.

Do you want to ask me any question before we start the interview?

Once again, thank you for participating in the in-depth interview.

Introduction

- Please introduce yourself(full name and age).

Main questions	Probing question
1. General knowledge about HIV/AIDS I am going to ask you some questions related to general awareness about HIV/AIDS. • Can you tell me what causes HIV infection? • How can one become infected?	

• What can protect oneself from HIV? • What is your feeling or perception about people living with HIV/AIDS?	
2. Perceived severity • In your own terms, can you tell me your feeling or perception about the seriousness or severity of HIV? • Can you a bit explain on the difference between HIV/AIDS and other diseases?	
3. Perceived susceptibility • What do you think your risk is for becoming HIV infected?	• Can you explain on the probability of your risk of acquiring HIV?
4. Perceived benefit of HIV testing • Please can you tell me your perception on the benefits of getting an HIV test?	
5. Perceived barriers to HIV testing • Can you tell me where HIV testing is available? • What are the reasons you would not get an HIV test?	How do you evaluate people's influence on your testing? • Who support your testing • Who oppose your testing Can you tell me environmental obstacles not to get tested? What impact does HIV testing have on you? What are the situations that can facilitates your testing?
6. Perceived self- efficacy • Say you planned to do an HIV test, Can you tell me about how you are going to go about it? • What would you do if you found out you were HIV-? • What would you do if you found out you were HIV+?	What other things do you do if you are negative or positive? How do you assess your confidence about attending care and treatment services after positive test result?
7. Cues to action • Have you ever thought about getting an HIV test? • If yes, what really changed your mind?	• What made you think about getting tested?
8. What is your future intention regarding HIV testing?	

I really appreciate you for taking your time and providing us with valuable information. I have no further questions. Do you have anything more you want to bring up, or ask about before we conclude the interview?

APPENDIX B: In-depth interview guide Amharic version

በፈቃደኝነት ላይ የተመሰረተ የኤች አይ ቪ ኤድስ ምክርና ምርመራ አገልግሎት ጋር በተገናኘ በዩኒቨርሲቲ ተማሪዎች ላይ የሚደረግ የአመለካከትና የባህሪ ጥናት

ክፍል 1: የአንድ ለአንድ የጠለቀ የቃል መጠይቅ መመሪያ

መግቢያና ትውውቅ

- እራስዎንና የጥናቱን አላማ ያስተዋውቁ።
- ተጠያቂው የሚሰጡት መረጃ የጥናቱን አላማ ለማሳካት ወስኝ እንደሆነ ይግለጹላቸው።
- ተጠያቂው የሚሰጡት መረጃ በሚስጥራዊነት እንደሚያዝና ለሌሎች ይፋ እንደማይሆን ይግለጹ።
- ተጠያቂው የሚሰጡት መረጃ ጥናትን ከሚያካሂደው አጥኚና ከጥናቱ ጋር የተያያዙ ሌሎች ሰዎች በስተቀር ማየት እንደማይችሉ ያብራሩ።
- ተጠያቂው የሚሰጡት ማንኛውም መረጃ ጠቃሚ ነው። በዚህ ቃል መጥይቅ ትክክል ወይም ስህተት የሆነ መልስ የለም።
- የጥናቱን መረጃ ለበለጠ ትንተናና ያመች ዘንድ በመቅረፀ ድምጽ የሚቀዳ ይሆናል። ይህ እንዲሆን ፍቃደኛ መሆንዎን ቢገልጹልን።
- በማንኛውም ሰዓት ቃለመጠይቁን የማቋረጥ መብት የተጠበቀ ነው።
- እባክዎን ቃለመጠይቁን ከመጀመራ በፊት የሚጠይቁኝ ጥያቄ ካለ።
- በድጋሜ በጣም አመሰግናለሁ ቀጥታ ወደ መንደርደሪያ ጥያቄዎቼ አናመራለን።

መንደርደሪያ ጥያቄዎች

- እራስህን እስቲ አስተዋወቅ(ሙሉ ስምና ዕድሜ)

ዋና መጠይቆች	ማፈጫ ጥያቄዎች
1 አሁን እጠቃላይ የ ኤች አይ ቪ ኤድስ እውቀት መለኪያ ጥያቄዎች እጠይቅዎታለሁ። • በእርሶ አመለካከት ኤች አይ ቪ ኤድስ በምን ሊከሰት ወይም ሊመጣ እንደሚችል ሊነግሩኝ ይችላሉ? • በእርሶ አመለካከት አንድ ሰው በ ኤች አይ ቪ ኤድስ አንዴት ሊያዝ እንደሚችል ሊነግሩኝ ይችላሉ? • በእርሶ አመለካከት ኤች አይ ቪ ኤድስ እንዴት መከላከል ይቻላል? • በእርሶ አመለካከት በኤች አይ ቪ ኤድስ የተጠቁ ሰዎችን እንዴት ይመለከቷቸዋል?	
2 ስለኤች አይ ቪ ኤድስ ያለዎትን የበሽታ ደረጃ ምልከታ • በእርሶ አመለካከት ኤች አይ ቪ ኤድስን እንደ በሽታ ምን አይነት ደረጃ ይሰጡታል? • በእርሶ አመለካከት ኤች አይ ቪ ኤድስ ከሌሎች በሽታዎች ጋር ያለው ልዩነት ምንድነው ተቀራራቢነትስ?	

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3 ከኤች አይ ቪ ኤድስ ጋር በተገናኘ ያለዎትን የበሽታ ተጋላጭነት ምልከታ • ለኤች አይ ቪ ኤድስ ያለዎትን ተጋላጭነት እንዴት ያዩታል?	እስቲ እራስዎትን ለኤች አይ ቪ ኤድስ ሊያጋልጡ የሚችሉ ሁኔታዎችን ይግለጹልኝ?
4 የኤች አይ ቪ ኤድስ ምርመራ አገልጎት ጠቀሜታ ምልከታ • ኤች አይ ቪ ኤድስ በመመርመር ምን አይነት ጥቅም አገኛለው ብለው ያምናሉ? •	
5 የኤች አይ ቪ ኤድስ ምርመራ አገልግሎትን ላለመጠቀም የሚዳርጉ ምልከታዎች • ኤች አይ ቪ ኤድስ ምርመራ የት እንደሚገኝና እንደሚሰጥ ሊነግሩኝ ይችላሉ? • ኤች አይ ቪ ኤድስ ለምንድነው ያልተመረመሩት? •	የሌሎች ሰዎችን ጫና ወይም ተጽ ቢነግሩኝ • ኤች አይ ቪ ኤድስ መመርመሮን ማን ይደግፍልዎታል? • ማንስ ይቃወማል? አካባቢያዊ መሰናክሎች ሊነግሩኝ ይችላሉ? ኤች አይ ቪ ኤድስ በመመርመርዎት ምን ችግር ሊያስከትልብዎት ይችላል? ኤች አይ ቪ ኤድስ እንዲመረመሩ ሁኔታዎችን የሚያቀልልዎት ነገሮች ምን ምንድናቸው?
6 ኤች አይ ቪ ኤድስ የመመርመር ብቃት • ኤች አይ ቪ ኤድስ ለመመርመር ቢያስቡ እንዴት ነው የሚያደርጉት? • ኤች አይ ቪ ኤድስ መመርመር ቢያስቡ ምን ያህል ይሳካልኛል ብለው ያስባሉ? • ኤች አይ ቪ ኤድስ ፖዘቲቭ ቢሆኑ ምን ያደርጋሉ? • ኔጌቲቭ ቢሆኑስ?	• እባክዎትን አስቃላይ የሚያደርጉትን ነገሮች ቢነግሩኝ? • ኤች አይ ቪ ኤድስ ለመመርመር ብቃትዎትን ወይም ዝግጁነትዎትን ቢነግሩኝ?
7 መጀመሪያ ኤች አይ ቪ ኤድስ ለመመርመር ሲያስቡ ምንድን ነው የነሳሳዎት ነገር?	• እንዲመረመሩ ያደረጓት ዋና ነገር ምንድን ነው?
8 ለወደፊቱ ኤች አይ ቪ ኤድስ ለመመርመር ያለዎትን እቅድ ምን ይመስላል?	

ግሌዎትን ሰጥተው ቃለመጠይቁን በትእግስት ስላከናወኑ እጅግ በጣም አመሰግናለሁ።

እርሶ መጠየቅ የሚፈልጉት ጥያቄ ካለ እድሉን ለእርሶ ልስጥ።

ጥያቄዎቹን በዚሁ አበቃለሁ አመሰግናለሁ።

APPENDIX C: Consent form for participants of in-depth interview

CONSENT TO PARTICIPATE IN IN-DEPTH INTERVIEW ON THE
APPLICATION OF THE HEALTH BELIEF MODEL (HBM) TO PREDICT VOLUNTARY HIV TESTING BEHAVIOR

AMONG UNIVERSITY STUDENTS IN ETHIOPIA

You are asked to participate in in-depth interview conducted as part of a research project by Zelalem Mehari Alemayehu, a doctoral student at the University of South Africa (UNISA).
If you have any questions or concerns about the research or in-depth interview, please feel free to contact the investigator: Zelalem Mehari Alemayehu (e-mail: zelalemmehaia@yahoo.com, Tele: +251 913 51 7820).

PURPOSE OF THE STUDY
The aim of this research is to explore and analyze HIV testing behavior and intentions among university students based on health belief model (HBM) in order to contribute to the knowledge gap regarding HIV testing behavior and to test the applicability of the model in Ethiopia.

PROCEDURES
If you volunteer to participate in the in-depth interview, your participation will take about one hour. The following procedures will be undertaken during the interview: The interview will be conducted by the investigator of the study. The interview will be audio-taped but you will not be identified. Interview notes will be taken by the investigator. Research findings can be available to you through publication or your university.

POTENTIAL RISKS AND DISCOMFORTS

There are no significant risks or discomforts anticipated from participating in this interview. There might be minor discomfort attached to discussing some sensitive questions. Should you feel that you are experiencing discomfort, you may leave the interview at any time. If you want to get psychological and social support, please contact the investigator of the study who will refer you to a source.

POTENTIAL BENEFITS TO PARTICIPANTS AND/OR TO SOCIETY

There is no direct benefit to you from participating in this research. However, the results of this study can contribute to knowledge regarding HIV testing behavior in university students and help in designing HIV testing programs in university settings in the country.

PAYMENT FOR PARTICIPATION

There is no payment for participating in this study.

CONFIDENTIALITY
The interview notes and tape records will not be shared with persons other than the investigator/assistants of this study and are not linked with personal identifiers. The tape recordings and interview notes will be kept in a locked cabinet for five years and will be destroyed after five years. Only electronic copies of the records will be kept with passwords after five years. The result of the study can be communicated through journals or other outlets. You cannot be identified from your participation.

PARTICIPATION AND WITHDRAWAL

You can choose whether to be in the interview or not. There are no consequences for declining to participate. If you volunteer to be in the interview, you may withdraw at any time without consequences of any kind.

RIGHTS OF RESEARCH PARTICIPANTS
You may withdraw your consent at any time and discontinue participation without penalty. You are not waiving any legal claims, rights or remedies because of your participation in this research study. This study has been reviewed and received ethical clearance through the UNISA and Ethiopian ministry of science and technology ethical committees. If you have questions regarding your rights as a research participant, please contact the investigator of the study.

SIGNATURE OF RESEARCH PARTICIPANT/LEGAL REPRESENTATIVE

I have read the information provided for the study as described herein. My questions have been answered to my satisfaction, and I agree to participate in this interview.

Signature of Participant _____ Date _____

ANNEXURE D: Ethical clearance from Health Studies Higher Degree Committee of UNISA

UNISA | university of south africa

UNIVERSITY OF SOUTH AFRICA
Health Studies Higher Degrees Committee
College of Human Sciences
ETHICAL CLEARANCE CERTIFICATE

HSHDC/169/2013

Date: 6 March 2013   Student No: 4991-816-8

Project Title: Application of health belief model (HBM) to predict voluntary HIV testing behavior among university students in Ethiopia.

Researcher: Zelalem Mehari Alemayehu

Degree: D Litt et Phil   Code: DPCHS04

Supervisor: Prof S Benedict
Qualification: Doctoral of Nursing Science
Joint Supervisor: -

DECISION OF COMMITTEE

Approved   [√]   **Conditionally Approved**   [ ]

Prof L Roets
CHAIRPERSON: HEALTH STUDIES HIGHER DEGREES COMMITTEE

Prof MM Moleki
ACTING ACADEMIC CHAIRPERSON: DEPARTMENT OF HEALTH STUDIES

PLEASE QUOTE THE PROJECT NUMBER IN ALL ENQUIRES

ANNEXURE E: Letter written from UNISA (Addis Ababa Regional Office) to Ministry of Science and Technology

UNISA | university of south africa

June 4, 2013

UNISA-ET/KA/ST/29/ 04-06-2013

National Research Ethics Review Committee (NRERC)
Ministry of Science and Technology
Addis Ababa

Dear Sirs/Madams:

Mr. Zelalem Mehari Alemayehu (St. No. 49918168) is a doctoral program student in the department of Health Studies at University of South Africa (UNISA). He has completed his research proposal and ethical clearance has been issued to him by Health Studies Higher Degrees Committee of UNISA. The title of his research is:

APPLICATION OF THE HEALTH BELIEF MODEL (HBM) TO PREDICT VOLUNTARY HIV TESTING BEHAVIOR AMONG UNIVERSITY STUDENTS IN ETHIOPIA.

The student is currently registered for the thesis phase and is expected to undertake his research. He will conduct the study in randomly selected four public universities in Ethiopia. This is, therefore, to kindly request your cooperation in providing the student with ethical clearance.

UNISA REGIONAL LEARNING CENTRE
PO BOX 13836 ADDIS ABABA ETHIOPIA
TEL   +251-114-350141
          +251-114-350078
FAX   +251-114-351243
MOBILE   +251-912-191483

Sincerely,

Meseret Melese Tefera
Deputy Director
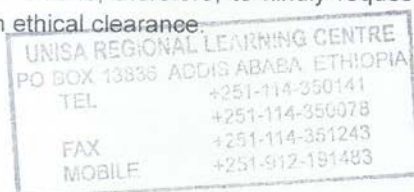
University of South Africa
Regional Learning Centre
PO Box 13836 ADDIS ABABA - Ethiopia
Telephone: +251 114 35 0141 / +251 114 35 0078
Facsimile: +251 114 35 1242/43/44
Mobile: +251 912 19 1483
www.unisa.ac.za

ANNEXURE F: Ethical clearance from National Research Ethics Review Committee of Ministry of Science and Technology in Ethiopia

በኢትዮጵያ ፌዴራላዊ ዲሞክራሲያዊ ሪፐብሊክ
የሳይንስና ቴክኖሎጂ ሚኒስቴር

The Federal Democratic Republic of Ethiopia
Ministry of Science and Technology

ቁጥር ___ 3\0\339\05
Ref. No.

ቀን ___ 15\12\2005
Date

To: University of South Africa, regional office

Addis Ababa

Re: Application of The health belief Model (HBM) to predict Voluntary HIV testing Behavior among University students in Ethiopia

Dear sir/Mr./s/Dr.

The National Research Ethics Review committee (NRERC) has reviewed the aforementioned project protocol in an expedited manner. We are writing to advise you that NRERC has granted

Full Approval

To the above named project, for a period of <u>one year (August 21, 2013- August 20, 2014).</u> All your most recently submitted documents have been approved for use in this study. The study should comply with the standard international and national scientific and ethical guidelines. Any change to the approved protocol or consent material must be reviewed and approved through the amendment process prior to its implementation. In addition, any adverse or unanticipated events should be reported within 24-48 hours to the NRERC. Please ensure that you submit progress report once in a four month and annual renewal application 30 days prior to the expiry date.

We, therefore, request your esteemed organization to ensure the commencement and conduct of the study accordingly and wish for the successful completion of the project.

With regards,

Yohannes sitotaw

Secretary of NRERC

Cc - Mr Zelalem Mehari Alemayehu (PI)

Addis Ababa

የሚገኙበት አድራሻ
You may Contact

ምድብ አድራሻ ___ አዲስ አበባ ኢትዮጵያ ___ ስልክ ___ ፋክስ

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ANNEXURE G: Letter written to AAU from UNISA regional office in Addis Ababa

UNISA

ADDIS ABABA UNIVERSITY

ADDIS ABABA

Dear Madam/Sir,

The University of South Africa (UNISA) extends warm greetings to you and the staff of your esteemed University. By this letter, we want to certify that Mr. Zelalem Mehari Alemayehu (student number 49918168) is a PhD student in Nursing Sciences at the University of South Africa (UNISA). Currently, he is at the stage of data collection on his Doctoral thesis entitled *"Application of Health Belief Model (HBM) to predict Voluntary HIV Testing Behaviour among University Students in Ethiopia."*

Therefore, we kindly request your cooperation in providing the student access to data sources in your University that pertain to his area of research. We would like to thank you in advance for all the assistance that you would provide to the student. Attached, please find the ethical clearance certificate he secured from UNISA.

Sincerely,

Tsige GebreMeskel Aberra

Deputy Director – Academic and ICT Support

UNISA – ETHIOPIA Centre for Graduate Studies

ANNEXURE H: Letter written to DBU from UNISA regional office in Addis Ababa

UNISA | university of south africa

07 May, 2015

UNISA-ET/KA/ST/29/07-05-15

DEBREBIRHAN UNIVERSITY

DEBREBIRHAN

Dears Madam/Sir,

The University of South Africa (UNISA) extends warm greetings to you and the members of your esteemed University. By this letter, we want to certify that Mr. Zelalem Mehari Alemayehu (student number 49918168) is a PhD student in the field of Health Studies at the University of South Africa (UNISA). Currently, he is at the stage of the second phase of data collection on his Doctoral thesis entitled *"Application of health belief model (HBM) to predict voluntary HIV testing behavior among university students in Ethiopia."*

This is therefore to kindly request your cooperation in providing the student access to data sources. We would like to thank you in advance for all the assistance that you would provide to the student. Attached, please find the ethical clearance certificate that he secured from UNISA.

Sincerely,

UNISA REGIONAL LEARNING CENTRE
PO BOX 13836 ADDIS ABABA ETHIOPIA
TEL   +251-114-350141
       +251-114-350078
       +251-114-351243
FAX
MOBILE +251-912-191483

Tsige GebreMeskel Aberra

Deputy Director – Academic and ICT Support

UNISA – ETHIOPIA Centre for Graduate Studies

University of South Africa
Regional Learning Center
P.O. Box: 13836, Addis Ababa, Ethiopia
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Facsimile: +251 11 435 1242/ 43/ 44
Mobile: +251 912 19 1483
www.unisa.ac.za

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ANNEXURE I: AAU approval letter

March 10, 2014

Academic Vice President Office

Addis Ababa University

Addis Ababa

Subject: Application to conduct study among Biology and Accounting students in your university

Dear Sirs/Madams,

As per the attached letter from University of South Africa, I have randomly selected two departements in the undergraguate programs (Biology and Accounting) to conduct an indepth interview of students on my research topics. After finalizing the inepth interview, I will randemly slecet two classes from the same departements to pilot my study questionnnaire.

Please can you write for me a support letter to departement of **Biology** and **Accounting** so that I can conduct my study smoothly.

I have attached all necessary documents with this letter.

With best regards

Zelalem Mehari

Forward to College of Natural Science and Business and Economics For support

12/3/2014

ANNEXURE J: DBU university approval letter

UNISA | university of south africa

07 May, 2015

UNISA-ET/KA/ST/29/07-05-15

DEBREBIRHAN UNIVERSITY

DEBREBIRHAN

Dears Madam/Sir,

The University of South Africa (UNISA) extends warm greetings to you and the members of your esteemed University. By this letter, we want to certify that Mr. Zelalem Mehari Alemayehu (student number 49918168) is a PhD student in the field of Health Studies at the University of South Africa (UNISA). Currently, he is at the stage of the second phase of data collection on his Doctoral thesis entitled *"Application of health belief model (HBM) to predict voluntary HIV testing behavior among university students in Ethiopia."*

This is therefore to kindly request your cooperation in providing the student access to data sources. We would like to thank you in advance for all the assistance that you would provide to the student. Attached, please find the ethical clearance certificate that he secured from UNISA.

Sincerely,

Tsige GebreMeskel Aberra

Deputy Director – Academic and ICT Support

UNISA – ETHIOPIA Centre for Graduate Studies

To the researcher

It is permitted to collect the data in close contact with Health Science College of the University

Gebre Kiross

APPENDIX K: Content validity assessment form

UNIVERSITY OF SOUTH AFRICA (UNISA)

APPLICATION OF THE HEALTH BELIEF MODEL (HBM) TO PREDICT VOLUNTARY HIV TESTING BEHAVIOR AMONG UNIVERSITY STUDENTS IN ETHIOPIA

Content validity assessment form

Instruction for the content Experts

Thank you for agreeing to review and evaluate the scale developed for understanding HIV testing behavior among university students using health belief model (HBM). You are selected for this task because of your interest and expertise in the development of scales to measure HIV testing behavior of university students using HBM.

The following information is included:

1. Description of the conceptual model for the scale development
2. Description of the scale
3. Form for rating item-relevancy

The procedure for this task is

1. Read the description of the theoretical basis of scale development
2. Using the rating form, rate each item as to its degree of relevance in measuring HIV testing behavior among university students using HBM
3. Note whether items are appropriate to measure HIV testing behavior in the context of HBM
4. Make any suggestions you may have for the addition, modifications or deletion of items or for changes in the wording of items on the form itself in the right end of the column

Conceptual framework for scale development

The HBM is derived from value expectancy theory and has been effective in determining factors associated with disease prevention, early disease detection and sick role behaviors. The components of the HBM hypothesize that behavior is a function of two factors: the value an individual place on health (value avoiding illnesses/getting well) and the individual's belief that a specific action may prevent (ameliorate) illness (Glanz et al 2008). The HBM contains constructs or concepts that predict why people will take action to prevent, to screen for and to manage illness conditions. These are perceived susceptibility, perceived severity, perceived benefit, perceived barrier, perceived self-efficacy and cues to action.

The HBM will be used as a conceptual framework to guide the overall conduct of the study. The theory(Annexure 1) underpinning this study is: If individuals believe that they are susceptible to HIV, believe that HIV/AIDS would have potentially serious consequences, believe that HIV testing would be beneficial either to accessing

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early HIV/AIDS treatment services or prevent further susceptibility to HIV, believe the anticipated benefit of taking an HIV test would outweigh the barriers to taking an HIV test, believe in their ability or confidence to successfully take an HIV test and the presence of triggers or cues to take an HIV test, then individuals are likely to receive HIV testing or intend to take HIV testing. Modifying factors such as socio-demographic variables and comprehensive knowledge about HIV/AIDS will affect individual beliefs related to HIV test seeking behavior (Glanz et al 2008).

Description of the scale

This scale is intended to explain or predict HIV testing behavior using the six components of health belief model. This scale is developed based on literature review and qualitative study (in-depth interview of university students). Once the scale is developed and tested it will be further used for the quantitative phase of the study. This scale is composed of 63 items representing the six components of HBM and HIV testing intentions for the current content validity assessment. Each item is rated on a five-point scale from " (1) strongly disagree/Not likely at all" to "Strongly agree/very likely" to each item are summed to yield a total score. And items related to cues to action are rated on three-point scale from "agree (3)" to "disagree (1) responses".

Relevancy rating form

Please use the following form to rate the relevancy of each item to their respective construct of HBM in the context of HIV testing behavior. Please read each item carefully; then rate each item on the four point scale in terms of how relevant you believe it is in measuring health belief model in the context of HIV testing

    1= not relevant

    2= somewhat relevant

    3= quite relevant

    4=very relevant

	HBM constructs : Likert scale	Relevancy rating				Suggestions regarding changes in the wording, clarity and conciseness of items or addition/deletion of items
	Perceived susceptibility					
1	I am afraid that I might contract HIV	1	2	3	4	
2	I believe that there is a chance of my getting infected with HIV/AIDS in the next one year	1	2	3	4	
3	I believe that I might get HIV even if I am only having sex with one partner	1	2	3	4	

4	I believe that I might be infected with HIV if my sex partner is having unsafe sex with others	1	2	3	4	
5	I believe that I am free of HIV because I have no HIV/AIDS related sign and symptoms	1	2	3	4	
6	I believe that I have no exposure for HIV/AIDS because I don't share sharp materials with other people	1	2	3	4	
7	HIV/AIDS is not my concern because I don't have any sexual exposure	1	2	3	4	
8	I don't consider myself to be at risk for HIV	1	2	3	4	
	Perceived Severity					
1	I believe that HIV/AIDS is non-curable disease and requires lifelong medication	1	2	3	4	
2	I am afraid that HIV/AIDS could cause death or disability to me	1	2	3	4	
3	If I am infected with HIV, I believe that HIV/AIDS could disrupt my family, social and economic activities	1	2	3	4	
4	If I am infected with HIV, I believe that it could cause psychological problem to me	1	2	3	4	
5	I would rather have any other terminal illness than AIDS	1	2	3	4	
6	I would rather die from a violent death(e.g. gun shot, car accident, etc) than from AIDS	1	2	3	4	
	Perceived benefit					
1	I believe that HIV testing will provide me the option to know my HIV status and get emotional relief	1	2	3	4	
2	I feel that HIV testing will help me plan to avoid infection in the future	1	2	3	4	
3	HIV testing provides me the option to get early treatment before getting seriously sick	1	2	3	4	
4	I believe that I can plan my future with full confidence through having HIV testing	1	2	3	4	
5	I believe that HIV testing would help me avoid transmitting HIV to others without knowing my status	1	2	3	4	

6	I believe that HIV testing help me identify my sexual partner for the future	1	2	3	4	
7	I don't believe that knowing my HIV status could improve the effect of HIV/AIDS on my health	1	2	3	4	
	Perceived barrier					
1	I am afraid to take HIV testing for fear of hearing HIV positive result	1	2	3	4	
2	I am afraid of the stigma attached to HIV positive result	1	2	3	4	
3	I am afraid of separation from my friends and families due to my HIV positive result	1	2	3	4	
4	I don't want to wait long time at HIV testing facilities in order to have HIV testing	1	2	3	4	
5	I am embarrassed to ask for HIV testing at HIV testing facilities	1	2	3	4	
6	I am worried about confidentiality at HIV testing facilities	1	2	3	4	
7	I am afraid that I may lose my partner if I tested for HIV	1	2	3	4	
8	I don't want anyone to know that I'm sexually active/ at risk	1	2	3	4	
9	I am afraid that people may talk about me if I got to for HIV testing	1	2	3	4	
10	I believe that HIV testing currently being offered provides accurate test	1	2	3	4	
11	I am afraid that HIV testing procedure is painful because of needle pricks and other procedures	1	2	3	4	
12	I am afraid blood and other contamination during HIV testing may happen to me	1	2	3	4	
13	I know where I can get free HIV testing	1	2	3	4	
14	People will look down on me if I am HIV positive	1	2	3	4	
15	I will not be accepted by the society if I am HIV positive	1	2	3	4	
16	I may find out I am HIV positive	1	2	3	4	
17	People who do the test will know my HIV test result	1	2	3	4	
18	I will have to wait for long time for the HIV test result	1	2	3	4	
	Perceived self-efficacy					
1	For me it would be easy to have HIV testing performed	1	2	3	4	
2	I am confident that I can convince my girl/boyfriend to go for HIV testing	1	2	3	4	

3	I am confident that I can deal with health workers who are providing HIV testing services in order to get tested	1	2	3	4	
4	I am confident that I can manage the physical pain and effects of HIV/AIDS from interfering with my daily life and future plans	1	2	3	4	
5	I am confident that I can manage the emotional disturbances caused by HIV positive result from interfering with my normal daily life and future plans	1	2	3	4	
6	I am confident that I can change my current risky sexual behavior after negative HIV test result	1	2	3	4	
7	I am confident that I will remain faithful with my partner after my negative HIV test result	1	2	3	4	
8	I am confident that I will use condoms properly and consistently to avoid future HIV risk after negative HIV test result	1	2	3	4	
9	I am confident that I will limit the number of sexual partners to avoid future HIV risk after HIV testing	1	2	3	4	
10	I can get HIV/AIDS treatment right away if I need it	1	2	3	4	
	Cues to action					
1	I recall seeing TV, billboards, posters messages about the importance of HIV testing during the past one year	1	2	3	4	
2	During the past one year, I have received advice from a health professional about HIV testing	1	2	3	4	
3	During the past one year, I recall some form of HIV testing promotion in the campus	1	2	3	4	
4	My girlfriend/boyfriend usually thinks that it is good if I am tested for HIV	1	2	3	4	
5	My parents insisted that I should be tested fro HIV					
6	I have many friends who are tested for HIV	1	2	3	4	
7	I know people close to me who are ill with HIV/AIDS	1	2	3	4	

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8	I was asked to get tested for HIV as a requirement to donate blood or to go to abroad or other circumstances	1	2	3	4	
9	I was sick with HIV/AIDS like disease in the past	1	2	3	4	
	HIV testing intentions	1	2	3	4	
1	How likely are you in need of HIV counseling and testing service the next time you go for health care services?	1	2	3	4	
2	How likely are you to get tested for HIV in the next three months?	1	2	3	4	
3	How likely are you to do regular HIV testing in the future?	1	2	3	4	

APPENDIX L: The initial HTBS scale ready for piloting - English version

A SELF-ADMINSTERED QUESTIONNAIRE TO STUDYTHE

APPLICATION OF THE HEALTH BELIEF MODEL (HBM) TO PREDICT VOLUNTARY HIV TESTING BEHAVIOR AMONG UNIVERSITY STUDENTS IN

ETHIOPIA

It is an honor to invite you to participate in this study and I appreciate your volunteering to commit your time to complete the self-administered questionnaire on application of the Health Belief Model (HBM) to predict voluntary HIV testing behavior among university students. My name is Zelalem Mehari Alemayehu and I am a doctoral student at the University of South Africa in Pretoria. The completion of this study is a part of my educational program there. I am the principal researcher for this project.

This study is conducted in randomly selected universities in Ethiopia with the aim of exploring and analyzing HIV testing intentions among university students based in order to contribute to the knowledge gap regarding HIV testing behavior and to test the applicability of the Health Belief Model in Ethiopia.

I kindly ask you to respond to all the questions in this questionnaire. I would like to remind you once again that all the information you are providing is confidential and is not linked to you in any way. You cannot be identified from any of your responses.

Please encircle the number of your best answer from the choices given under each question. If you want to change your answer please put an "X" mark on the previous answer and encircle on your new choice.

Thank you for your time and interest. You are making a valuable contribution to the future health of the citizens of our country.

SN	Questions	Responses
A	**Socio-demographic characteristics**	
1	Age in years	
2	Gender	1. Male 2. Female
3	Ethnicity	1. Oromo 2. Amhara 3. Tigrie 4. Other specify_____
4	Religion	1. Orthodox Christian 2. Muslim 3. Protestant Christian 4. Catholic Christian 5. Other specify_____
5	Marital status	1.Single 2. Married 3. Divorced 4. Widowed
6	Class Year	1. Year I 2. Yea II 3. Year III 4. Year IV or more
7	Department/course enrolled in	
8	Place of growth	1. Rural setting 2. Urban setting
B	**Comprehensive knowledge about HIV/AIDS:** Please respond to the following questions by choosing "Yes" or "No" to the following questions	
1	HIV can be prevented by using condom	1. Yes

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		2. No
2	HIV can be prevented by limiting sexual intercourse to one uninfected partner	1. Yes 2. No
3	A healthy looking person can have the AIDS virus	1. Yes 2. No
4	The HIV virus can be transmitted by mosquito bites	1. Yes 2. No
5	The HIV virus can be transmitted by supernatural means	1. Yes 2. No
C	HBM constructs : Likert scale	
	Perceived susceptibility	
1	I am afraid that I might contract HIV	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
2	I believe that there is a chance that I might be infected with HIV/AIDS in the next one year	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
3	I believe that I might get HIV even if I am having sex with only one partner	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
4	I believe that I might be infected with HIV if my sex partner is having unsafe sex with others	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
5	I believe that I might be infected with HIV even if I am using condom	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
6	I believe that I am less susceptible to HIV because I have no HIV/AIDS related sign and symptoms	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
7	I believe that I am less susceptible to HIV/AIDS because I don't share sharp materials with other people	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
8	I am less concerned with HIV/AIDS because I don't have any sexual exposure	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
9	I don't consider myself to be at risk for HIV	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
	Perceived Severity	
1	I believe that HIV/AIDS is non-curable disease	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
2	If incase I am infected with HIV, I am afraid that HIV/AIDS could cause death to me	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree

3	If incase I am infected with HIV, I am afraid that HIV/AIDS could cause disability to me	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
4	If I am infected with HIV, I believe that HIV/AIDS could disrupt my family or social or economic activities	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
5	If I am infected with HIV, I believe that it could cause psychological problem to me	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
6	I would rather have any other terminal illness than AIDS	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
7	I would rather die from a violent death(e.g. gun shot, car accident, etc) than from AIDS	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
	Perceived benefit	
1	I believe that HIV testing will provide me the option to know my HIV status and get emotional relief	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
2	I feel that HIV testing will help me plan to avoid infection in the future	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
3	HIV testing provides me the option to get early treatment before getting seriously sick	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
4	I believe that I can plan my future with full confidence through knowing my HIV status	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
5	I believe that HIV testing would help me not to transmit HIV to others if incase I had HIV	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
6	I believe that HIV testing help me identify my sexual partner based on her/his HIV status	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
7	I don't believe that knowing my HIV status could improve the effect of HIV/AIDS on my health	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
	Perceived barrier	
1	I am afraid of hearing HIV positive result by undergoing HIV testing	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
2	I am afraid of the stigma attached to HIV positive result	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
3	I am afraid of separation from my friends and families due to my HIV positive result	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
4	I don't want to wait long time at HIV testing facilities in order to have HIV testing	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
5	I am embarrassed to ask for HIV testing at HIV testing facilities	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
6	I am worried about confidentiality at HIV testing facilities	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
7	I am afraid that I may lose my partner if my HIV test result turned out to be positive	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree

8	I don't want anyone to know that I'm sexually active/ at risk	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
9	I am afraid that people may talk about me if I go to a health facility for HIV testing	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
10	I have no doubts about HIV testing currently being offered	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
11	I am afraid that HIV testing procedure is painful because of needle pricks and other procedures	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
12	I am afraid blood and other contamination during HIV testing may happen to me	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
13	I know where I can get free HIV testing	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
14	People will look down on me if I am HIV positive	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
15	I will not be accepted by the society if I am HIV positive	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
16	I may find out I am HIV positive	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
17	People who do the test may disclose my HIV test result to other people	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
18	I will have to wait for long time for the HIV test result	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
	Perceived self-efficacy	
1	For me it would be easy to have HIV testing performed	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
2	I am confident that I can convince my girl/boyfriend to go for HIV testing	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
3	I am confident that I can deal with health workers who are providing HIV testing services in order to get tested	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
4	I am confident that I can manage the physical pain and effects of HIV/AIDS from interfering with my daily life and future plans in case of positive result	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
5	I am confident that I can manage the emotional disturbances caused by HIV positive result from interfering with my normal daily life and future plans in case of positive result	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
6	I am not confident that I will remain faithful with my partner after my negative HIV test result	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
7	I am not confident that I will use condoms properly and consistently to avoid future HIV risk after negative HIV test result	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
8	I am not confident that I will limit the number of sexual partners to avoid future HIV risk after HIV testing	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
9	I really don't know what I am going to do if I am going to be HIV	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree

	positive	
10	I cannot get HIV/AIDS treatment right away if I need it	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
	Cues to action	
1	I recall seeing TV or billboards or posters or messages about the importance of HIV testing during the past one year	1. Disagree 2. Don't know 3. Agree
2	During the past one year, I have received advice from a health professional about HIV testing	1. Disagree 2. Don't know 3. Agree
3	During the past one year, I recall some form of HIV testing promotion in the campus	1. Disagree 2. Don't know 3. Agree
4	My girlfriend/boyfriend usually thinks that it is good if I am tested for HIV	1. Disagree 2. Don't know 3. Agree
5	My parents insisted that I should be tested for HIV	1. Disagree 2. Don't know 3. Agree
6	I have friends who are tested for HIV	1. Disagree 2. Don't know 3. Agree
7	I know people close to me who are ill with HIV/AIDS	1. Disagree 2. Don't know 3. Agree
8	I was asked to get tested for HIV as a requirement to donate blood or to go to abroad or other circumstances	1. Disagree 2. Don't know 3. Agree
	HIV testing history	
1	Have you ever been tested for HIV?	1. Yes 2. No
2	Have you been HIV tested during the past one year?	1. Yes 2. No
3	If Yes question number 2, Have you heard or received the result of HIV test	1. Yes 2. No
	HIV testing intentions	
1	I have ever thought about getting HIV testing	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
2	How likely are you in need of HIV counseling and testing service the next time you go for health care services?	1. Not likely at all 2. Less likely 3. Don't know 4. Likely 5. Very likely
3	How likely are you to accept HIV testing if you are requested to get tested for HIV the next time you go for health care services	1. Not likely at all 2. Less likely 3. Don't know 4. Likely 5. Very likely
4	How likely are you to get tested for HIV in the next three months?	1. Not likely at all 2. Less likely 3. Don't know 4. Likely 5. Very likely
5	How likely are you to do regular HIV testing in the future?	1. Not likely at all 2. Less likely 3. Don't know 4. Likely 5. Very likely

APPENDIX M: The initial HTBS scale ready for piloting: Amharic version

የዩኒቨርሲቲ ተማሪዎችን የኤት አይ ቪ. ኤድስ የመመርመር ባህሪ/ተግባር   የሚወስኑ ሁኔታዎችን ለማውቅ የተደረገ ጥናት:

<u>የጤና ባህሪ አመለካከት ሞዴልን(THE HEALTH BELIEF MODEL) በመጠቀም የተደረገ ጥናት</u>

በተማሪዎች የሚሞላ መጠይቅ

መግቢያ

በቅድሚያ በዚህ ጥናት ለመሳተፍ ፍቃደኛ ስለሆኑ ከልብ የሆነ ምስጋናዬን አቀርባለሁ::   ስሜ ዘላለም መሓሪ አለማየሁ እባላለሁ:: በደቡብ አፍሪካ ዩኒቨርሲቲ(University of South Africa-UNISA) የዶክተሬት ዲግሪ ተማሪ ነኝ:: ይህ ጥናት ትምህርቴን ለማጠናቀቅ የማካሂደው አንዱ እና ዋናኛ አካል ሲሆን : ይህም ትምህርቴን በብቃት ለማጠናቀቅ ከፍተኛ አስተዋፅአ ይኖረዋል::

በዚህ መጠይቅ ውስጥ የተካተቱት ጥያቄዎች በሙሉ የጥናቱን ጥያቄዎች ለመመለስ አስፈላጊ ስለሆኑ ሁሉንም ጥያቄዎች እንዲመልሱ በትህትና እጠፅናለሁ::

በዚህ ቃለመጥይቅ ላይ የእርሶን ማንነት የሚገልፅ (ለምሳሌ ስምና የመሳሰሉትን መረጃዎች) ስለማይጠፍ ሚስጥራዊነቱ በፅኑአ የተጠበቀ ነው::

እባክዎትን የመረጡትን መልስ በማክበብ ያሳዩ:: ሀሳብዎን ከቀየሩ የተሳሳተው መልስ ላይ የኤክስ ምልክት(X) ካደረጉ በኃላ : ትክክለኛውን መልስ ያክብቡ::

ጥያቄዎቹን ሞልተው ሲጨርሱ መጠይቁን ለማስቀመጥ ወደ ተዘጋጀው ቦታ ያኑሩት::

በድጋሜ ግዜዎትን ስጥተው ይህን መጠየቅ ለመሙላት ፍቃደኛ በመሆኖ ከፍተኛ ምስጋና አቀርባለሁ::

ከጥናቱ ጋር በተያያዘ ጥያቄ ወይም ቅሬታ ካልዎት : በእነዚህ አድራሻዎች ጥያቄዎትን ማቅረብ ይችላሉ: - (ስልክ 0913517820; e-mail: <u>zelalemmeharia@yahoo.com</u>)

ተቁ	ጥያቄዎች /መጠይቆች	የእርሶ ምላሾች
ሀ	የግለሰባዊና ምህበራዊ መረጃዎች	
1	እድሜ(በአመት ይፃፉ)	
2	ፆታ	1 ወንድ 2 ሴት
3	ብሄር	1 ኦሮሞ 2 አማራ 3 ትግሬ 4 ሌላ ከሆነ ይፃፉ:_____
4	ሐይማኖት	1 ኦርቶዶክስ ክርስቲያን

		2 ሙስልም
		3 ፕሮቴስታንት ክርስቲያን
		4 ካቶሊክ ክርስቲያን
		5 ሌላ ከሆነ ይፃፉ_____
5	የጋብቻ ሁኔታ	1 ያላገባ
		2 ያገባ
		3 የተፋታ
		4 የሞተበት
6	ስንተኛ እመት ተማሪ ነዎት	1 አንደኛ
		2 ሁለተኛ
		3 ሦስተኛ
		4 አራተኛ እና ከዚያ በላይ
7	ዲፓርትመንትዎን(የትምህርት ክፍልን) ይፃፉ	
8	ያደጉበት አካባቢ የት ነው	1 ገጠር
		2 ከተማ
ለ	የ ኤት አይ ቪ ኤድስ ጠቅላላ እውቀት ምዘና	
1	ኤት አይ ቪ ኤድስን ኮንዶም በመጠቀም መከላከል ይቻል::	1 አዎ
		2 አይደለም
2	እንድ ለእንድ በመወሰን ኤት አይ ቪ ኤድስን መከላከል ይቻላል::	1 አዎ
		2 አይደልም
3	ጤናማ የሚመስል ሰው ኤት አይ ቪ ኤድስ ሊኖርበት ይችላል::	1 አዎ
		2 አይደልም
4	የኤት አይ ቪ ኤድስ ቫይረስ በወባ ትንኝ ንክሻ ሊተላለፍ ይችላል::	1 አዎ
		2 አይደለም
5		1 አዎ

	የኤት አይ ቪ ኤድስ ቫይረስ በፈጣሪ ቁጣ ወይም በሌላ አንዳች ሀይል ሊመጣ ይችላል::	2 አይደለም				
ሐ	የ THE HEALTH BELIEF MODEL መለኪያዎች					
	የሚከተሉትን አረፍተ ነገሮች በጥሞና ካነበቡ በኋላ በዐረፍተ ነገሩ ውስጥ የተመለከተው ሀሳብ ጋር መስማማትና አለመስማማዎትን በምርጫው ውስጥ ከተመለከቱት አማራጮች እንዱን ይምረጡ					
	ክፍል 1					
1	ኤት አይ ቪ ኤድስ በአንድም ወይም ቤሌላ መንገድ እንዳይዘኝ አፈራለሁ::	1 በፍፁም አልስማማም	2 አልስማማም	3 አልወሰንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ
2	በሚቀጥለው አንድ አመት ውስጥ ለኤች አይቪ ኤድስ የመጋለጥ አደል ምናልባት ሊያጋጥመኝ ይችላል::	1 በፍፁም አልስማማም	2 አልስማማም	3 አልወሰንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ
3	ምንም እንኳን አንድ የግብረስጋ ግንኙነት ጓደኛ ቢኖረኝም በኤች አይ ቪ ኤድስ የመያዝ አጋጣሚ ሊኖረኝ ይችላል::	1 በፍፁም አልስማማም	2 አልስማማም	3 አልወሰንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ
4	የፍቅር ጉዳኛዬ ጥንቃቄ የጎደለው ግብረ ስጋ ግንኙነት ከሌላ ሰው ጋር የሚፈፅም:: ወይም የምትፈፅም ከሆነ በኤ ች አይ ቪ ኤድስ የመያዝ አደል ሊኖረኝ ይችላል	1 በፍፁም አልስማማም	2 አልስማማም	3 አልወሰንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ
5	ምንም እንኳን ኮንዶም ሁዶም እና በትክክል ብጠቀምም ለኤች አይ ቪ ኤድስ የመያዝ አጋጣሚ ሊኖረኝ ይችላል::	1 በፍፁም አልስማማም	2 አልስማማም	3 አልወሰንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ
6	የኤች አይ ቪ ኤድስ በሽታ ምልክትና ስሜት አጋጥሞኝ ሰለማያውቅ ኤች አይ ቪ የለብኝም ብዬ አምናለሁ::	1 በፍፁም አልስማማም	2 አልስማማም	3 አልወሰንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ
7	ስለታማ ነገሮችን ከሌሎች ሰዎች ጋር አብሬ ሰለማልጠቀም ለኤች አይ ቪ እልተጋለጥኩም ብዬ አምናለሁ::	1 በፍፁም አልስማማም	2 አልስማማም	3 አልወሰንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ
8	የግብረ ስጋ ግንኙነት አድርጌ ስለማላውቅ ኤች አይ ቪ ኤድስ እነን አይመለከተኝም::	1 በፍፁም አልስማማም	2 አልስማማም	3 አልወሰንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ
9	እኔ በግሌ ሳስበው ለኤች አይ ቪ ኤድስ ተጋልጫለሁ ብዬ አላምንም::	1 በፍፁም አልስማማም	2 አልስማማም	3 አልወሰንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ
	ክፍል 2					
1	ኤች አይ ቪ ኤድስ ፍቱን መድኃኒት	1 በፍፁም አልስማማም	2 አልስማማም	3 አልወሰንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ

	ያልተገነዘለት በሽታ ነው፡፡					
2	ኤች አይ ቪ ኤድስ ገዳይ በሽታ ነው፡፡	1 በፍፁም አልስማማም	2 አልስማማም	3 አልወሰንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ
3	ኤች አይ ቪ ኤድስ በአካል እና በአእም ላይ ዘላቂ ጉዳት ሊያስከትል ይችላል፡፡	1 በፍፁም አልስማማም	2 አልስማማም	3 አልወሰንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ
4	በኤት አይ ቪ ኤድስ ብቻ ከጤና ጠንቅነት በሻጋር ማህበራዊ እና ኢኮኖሚያዊ ቀውስ ሊያደርስብኝ ይችላል፡፡	1 በፍፁም አልስማማም	2 አልስማማም	3 አልወሰንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ
5	በኤት አይ ቪ ኤድስ ብቻ ስነልቦናዊ ቀውስ ሊያስከትልብኝ ይችላል፡፡	1 በፍፁም አልስማማም	2 አልስማማም	3 አልወሰንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ
6	በኤች አይ ቪ ኤድስ ከምያዝ ቤላ አደገኛ በሽታ ብያዝ እመርጣለሁ፡፡	1 በፍፁም አልስማማም	2 አልስማማም	3 አልወሰንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ
7	በኤች አይ ቪ ኤድስ ከምሞት በሌሎች አደጋዎች ለምሰለ በመኪና አደጋ ወይም በጥይት ብሞት ይሻላል፡፡	1 በፍፁም አልስማማም	2 አልስማማም	3 አልወሰንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ
	ክፍል 3					
1	ኤች አይ ቪ ኤድስ ተመርምሬ እራሴን ባውቅ እፎይታ ይሰማኛል ብዬ አምናለሁ፡፡	1 በፍፁም አልስማማም	2 አልስማማም	3 አልወሰንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ
2	ኤች አይ ቪ ኤድስ በመመርመር ለወደፊቱ በበሽታው እንዳልያዝ መጠንቀቅና ማቅድ ያስችለኛል፡፡	1 በፍፁም አልስማማም	2 አልስማማም	3 አልወሰንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ
3	ኤች አይ ቪ ኤድስ በመመርመር በወቅቱ በሽታው ከፍተኛ ደረጃ ሳይደርስ ለመታከም ያስችለኛል ብዬ አስባለሁ፡፡	1 በፍፁም አልስማማም	2 አልስማማም	3 አልወሰንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ
4	ኤች አይ ቪ ኤድስ በመመርመር የወደፊት ህይወቴን በልብ ሙሉነትና በኮንፊደንስ ማቅድ ያስችለኛል፡፡	1 በፍፁም አልስማማም	2 አልስማማም	3 አልወሰንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ
5	ኤች አይ ቪ ኤድስ በመመርመር በሽታው ወደ ሌሎች ሰዎች እንዳይተላለፍ ለማድረግ ይረዳኛል ብዬ አምናለሁ፡፡	1 በፍፁም አልስማማም	2 አልስማማም	3 አልወሰንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ
6	ኤች አይ ቪ ኤድስ መመርመር የወደ ፊት የፍቅር ጓደኛዬን ለመለየት ይረዳኛል ብዬ አምናለሁ፡፡	1 በፍፁም አልስማማም	2 አልስማማም	3 አልወሰንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ

7	ኤች አይ ቪ ኤድስ የማይድን በሽታ ስለሆነ ኤች አይ ቪ ኤድስ መመርመር ለውጥ ሊያመጣልኝ አይችልም::	1 በፍፁም አልስማማም	2 አልስማማም	3 አላወሰንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ
	ክፍል 4					
1	በኤች አይ ቪ ኤድስ ምርመራ ቫይረሱ እንዳይገኝብኝ ስለምስጋ የኤች አይ ቪ ኤድስ ምርመራ ማድረግ አፈራለሁ::	1 በፍፁም አልስማማም	2 አልስማማም	3 አላወሰንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ
2	ከኤች አይ ቪ ኤድስ ጋር በተገናኘ ያለው መገለል እና መድልዎ ኤች አይ ቪ ኤድስ እንዳልመረመር ያደረገኛል ብዬ አስጋለሁ::	1 በፍፁም አልስማማም	2 አልስማማም	3 አላወሰንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ
3	በኤች አይ ቪ ኤድስ ምርመራ ውጤቴ ምክንያት ከቤተሰቦቼ ወይም ከጓደኞቼ በኩል የመገለል ችግር እንዳይደርስብኝ አፈራለሁ::	1 በፍፁም አልስማማም	2 አልስማማም	3 አላወሰንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ
4	የኤች አይ ቪ ኤድስ ምርመራ ለማካሄድ በጤና ተቋም ብዙ ሰዓት መጠበቅ አልፈለግም::	1 በፍፁም አልስማማም	2 አልስማማም	3 አላወሰንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ
5	ለኤች አይ ቪ ኤድስ ምርመራ ጤና ተቋም መሄድ አፈራለሁ::	1 በፍፁም አልስማማም	2 አልስማማም	3 አላወሰንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ
6	በጤና ተቋማት የሚሰጠውን የኤች አይ ቪ ኤድስ ምርመራ ምስጢራዊነት እጠራጠራለሁ::	1 በፍፁም አልስማማም	2 አልስማማም	3 አላወሰንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ
7	በኤች አይ ቪ ኤድስ ምርመራ ውጤቴ ምክንያት የፍቅር ጓደኛዬን እንዳላጣ አፈራለሁ::	1 በፍፁም አልስማማም	2 አልስማማም	3 አላወሰንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ
8	የግብረስጋ ግንኙነት እንደጀመርኩና ለኤች አይ ቪ ተጋላጭ እንደሆንኩ ሰዎች እንዲያውቁ ስለማልፈልግ ኤች አይ ቪ ኤድስ መመርመር አፈራለሁ::	1 በፍፁም አልስማማም	2 አልስማማም	3 አላወሰንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ
9	ለኤች አይ ቪ ኤድስ ምርመራ መሄዴን ሰዎች እንዳያወሩብኝ አፈራለሁ::	1 በፍፁም አልስማማም	2 አልስማማም	3 አላወሰንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ

10	አሁን በኢትዮጵያ ወስጥ እየተሰጠ ያለው የ ኤች አይ ቪ ኤድስ ምርመራ ትክክለኛነት ላይ ጥርጣሬ የለኝም::	1 በፍፁም አልስማማም	2 አልስማማም	3 አልወሰንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ
11	በኤች አይ ቪ ኤድስ ምርመራ ሂደት ወስጥ የሚያሳምሙ ሁኔታዎችን ለምሳሌ በመርፌ መወጋትን አፈራለሁ::	1 በፍፁም አልስማማም	2 አልስማማም	3 አልወሰንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ
12	ኤች አይ ቪ ኤድስ በምምረመርበት ወቅት በጤና ተቋም ወስጥ የደም ንክኪ እንዳያጋጠመኝ አፈራለሁ::	1 በፍፁም አልስማማም	2 አልስማማም	3 አልወሰንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ
13	ነፃ የኤች አይ ቪ ኤድስ ምርመራ የት እንደሚሰጥ አውቃለሁ::	1 በፍፁም አልስማማም	2 አልስማማም	3 አልወሰንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ
14	ኤች አይ ቪ ፖዚቲቭ ብሆን ሰዎች በንቀት አይን እንዳይመለከቱኝ አፈራለሁ::	1 በፍፁም አልስማማም	2 አልስማማም	3 አልወሰንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ
15	ኤች አይ ቪ ፖዚቲቭ ብሆን ማህበረሰቡ እንዳያገለኝ እሰጋለሁ::	1 በፍፁም አልስማማም	2 አልስማማም	3 አልወሰንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ
16	በኤች አይ ቪ ኤድስ ምርመራ ምክንያት የኤች አይ ቪ ቫይረስ እንዳይገኝብኝ አፈራለሁ::	1 በፍፁም አልስማማም	2 አልስማማም	3 አልወሰንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ
17	ኤች አይ ቪ ኤድስ የሚመረምሩት ጤና ባለሞያዎች ውጤቴን ለሌሎች ሰዎች እንዳይነግሩብኝ እሰጋለሁ::	1 በፍፁም አልስማማም	2 አልስማማም	3 አልወሰንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ
18	የኤች አይ ኤድስ ምርመራ ጣቢያዎች ብዙ ሰዓት እንዳያቆዩኝ አፈራለሁ::	1 በፍፁም አልስማማም	2 አልስማማም	3 አልወሰንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ
ክፍል 5						
1	የኤች አይ ቪ ኤድስ ምርመራ በቀላሉ ማድረግ እችላለሁ::	1 በፍፁም አልስማማም	2 አልስማማም	3 አልወሰንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ
2	የፍቅር ጉዳኛዬን አሳምኜ ወደ ኤች አይ ቪ ኤድስ ምርመራ መሄድ እንችላለን ብዬ አምናለሁ::	1 በፍፁም አልስማማም	2 አልስማማም	3 አልወሰንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ
3	የኤች አይ ቪ ኤድስ ምርመራ ከሚሰጡ ባለሞያዎች ጋር በግልፅ መነጋገር አይከብደኝም::	1 በፍፁም አልስማማም	2 አልስማማም	3 አልወሰንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ
4	በኤች አይ ቪ ኤድስ ብያዝ በበሽታው	1 በፍፁም አልስማማም	2 አልስማማም	3 አልወሰንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ

	ሊመጣ የሚችለውን አካላዊ ህምም የእለት ተእለት ኑሮዬን እንዳይረብሽ ምን ማድረግ እንዳለብኝ አውቃለሁ::					
5	በኤች አይ ቪ ኤድስ ብያዝ በበሽታው ሊመጣ የሚችለውን ስነልቦናዊና አእምሮአዊ ጉዳት የእለት ተእለት ኑሮዬን እንዳይረብሸኝ ምን ማድረግ እንዳለብኝ አውቃለሁ::	1 በፍጹም አልስማማም	2 አልስማማም	3 አልወሰንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ
6	ከኤች አይ ቪ ምርመራ በኋላ ከፍቅር ወይም ከትዳር ጉደኛዬ ጋር አንድ ለአንድ ተወስኜ መኖር ይከብደኛል::	1 በፍጹም አልስማማም	2 አልስማማም	3 አልወሰንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ
7	ለወደፊቱ ኤች አይ ቪ ኤድስ እንዳይዘኝ ኮንዶምን ሁሌም እና በጥንቃቄ መጠቀም ይከብደኛል::	1 በፍጹም አልስማማም	2 አልስማማም	3 አልወሰንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ
8	ከኤች አይ ቪ ምርመራ በኋላ የወሲብ ጓዳኛ ቁጥር መቀነስ ይከብደኛል::	1 በፍጹም አልስማማም	2 አልስማማም	3 አልወሰንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ
9	ኤች አይ ቪ ኤድስ በደሜ ውስ ጥ ቢገኝ ምን ማደርግ እንዳለ ኝ አላውቅም::	1 በፍጹም አልስማማም	2 አልስማማም	3 አልወሰንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ
10	ኤች አይ ቪ ኤድስ በደሜ ውስጥ ቢገኝ የኤች አይ ቪ ኤድስ ህክምና በቀላሉ ማግኘት ይከብደኛል::	1 በፍጹም አልስማማም	2 አልስማማም	3 አልወሰንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ
	ክፍል 6					
1	በተለያዩ የሚዲያ ውጤቶች ላይ ለምሳሌ በሬዲዮ፡ ቴሌቪዠን፡ በህትመት ሚዲያዎች በቢል ቦርድ ኤች አይ ቪ ኤድስ ምርመራን የሚያበረታታቱ መልእክቶችን ማየቴን አስታውሳለሁ::	1 በጣም አስታውሳለሁ 2 አላስታወስም 3 በፍጹም አላስታውስም				
2	ባለፈው አንድ ዓመት ውስጥ በጤና ባለሞያ የኤች አይ ቪ ምርመራ እንዳደርግ ምክር ተለግሶኛል::	1 በጣም አስታውሳለሁ 2 አላስታወስም 3 በፍጹም አላስታውስም				
3	ባለፈው አንድ ዓመት ውስጥ በካምፓሳችን ወይም በዩኒቨርስቲያችን ውስጥ ኤች አይ ቪ እንድንመረመር የሚያደርጉ	1 በጣም አስታውሳለሁ 2 አላስታወስም 3 በፍጹም አላስታውስም				

	መልእክቶቹን ሰምቼ አውቃለሁ::	
4	የፍቅር ጓደኛዬ ኤች አይ ቪ ኤድስ እንድመረመር ይገፋፋኛል ወይም ትገፋፋለች::	1 በጣም አስታውሳለሁ 2 አላስታወስም 3 በፍፁም አላስታውስም
5	ቤተሰቦቼ ወይም ወላጆቼ ኤች አይ ቪ እንድመረመር ያበረታቱኛል::	1 በጣም አስታውሳለሁ 2 አላስታወስም 3 በፍፁም አላስታውስም
6	ኤች አይ ቪ የተመረመሩ ጓደኞች አሉኝ::	1 በጣም አስታውሳለሁ 2 አላስታወስም 3 በፍፁም አላስታውስም
7	በኤች አይ ቪ ኤድስ የተያዘ በቅርበት የማውቀው ሰው አለ::	1 በጣም አስታውሳለሁ 2 አላስታወስም 3 በፍፁም አላስታውስም
8	አንዳንድ ኤች አይ ቪ ለመመርመር የሚያስገድዱ ሁኔታዎች(ለምሳሌ ደም ለመለገስ ወይም ውጭ ሀገር ለመሄድ) አጋጥሞኝ ያውቃል::	1 በጣም አስታውሳለሁ 2 አላስታወስም 3 በፍፁም አላስታውስም
ክፍል 7		
1	ኤች አይ ቪ ኤድስ ተመርምረው ያውቃሉ?	1 አዎ 2 አይደለም
2	ባለፈው አንድ አመት ውስጥ ኤች አይ ቪ ኤድስ ተመርምረው ያውቃሉ?	1 አዎ 2 አይደለም
3	ባለፈው አንድ አመት ውስጥ ኤች አይ ቪ ኤድስ ተመርምረው ከሆነ የኤች አይ ቪ ምርመራ ውጤትዎን ሰምተው ወይም ተቀብለው ነበር ወይ?	1 አዎ 2 አይደለም
ክፍል 8		
1	ኤች አይ ቪ ኤድስ ለመመርመር አስቤ አውቃለሁ::	1 በፍፁም 2 እንዳንዴ 3 አላስታውስም 4 በጣም 5 እጅግ በጣም
2	በሚቀጥለው ጊዜ ወደ ጤና ድርጅት ቪሄዱ ኤች አይ ቪ ኤድስ ምርመራ ለማግኘት ያልዎት ፍላጎት ምን ይመስላል?	1 በጣም አነስተኛ 2 አነስተኛ 3 አላውቅም 4 ከፍተኛ 5 በጣም ከፍተኛ
3	በሚቀጥለው ጊዜ ጤና ድርጅት ቪሄዱ የኤች አይ ቪ ኤድስ የምርመራ አገልግሎት ቢሰጦት የመቀበል ፈለጎቶው ምን ይመስላል?	1 በጣም አነስተኛ 2 አነስተኛ 3 አላውቅም 4 ከፍተኛ 5 በጣም ከፍተኛ

4	በሚቀጥሉት ሶስት ወራት ውስጥ ኤች አይ ቪ ኤድስ የመመርመር አቅድዎትንና ፌላጎትዎትን እንዴት ያዩታል?	1 በጣም አነስተኛ 2 አነስተኛ 3 አላውቅም 4 ከፍተኛ 5 በጣም ከፍተኛ
5	ለወደ ፊቱ በመደበኛ መልኩ የ ኤች አይ ቪ ኤድስ ምርመራ ለማካሄድ ያለዎት ፍላጎት ምን ይመስላል?	1 በጣም አነስተኛ 2 አነስተኛ 3 አላውቅም 4 ከፍተኛ 5 በጣም ከፍተኛ

ይህን ቃለመጠይቅ ለመሙላት ስለሰጡን ጊዜ እጅግ በጣም አድርገን እናመሰግናለን!!!

APPENDIX N: The final HTBS scale ready for crossectional survey - English version

A SELF-ADMINSTERED QUESTIONNAIRE TO STUDYTHE

APPLICATION OF THE HEALTH BELIEF MODEL (HBM) TO PREDICT VOLUNTARY HIV TESTING BEHAVIOR AMONG

UNIVERSITY STUDENTS IN ETHIOPIA

It is an honor to invite you to participate in this study and I appreciate your volunteering to commit your time to complete the self-administered questionnaire on application of the Health Belief Model (HBM) to predict voluntary HIV testing behavior among university students. My name is Zelalem Mehari Alemayehu and I am a doctoral student at the University of South Africa in Pretoria. The completion of this study is a part of my educational program there. I am the principal researcher for this project.

This study is conducted in randomly selected universities in Ethiopia with the aim of exploring and analyzing HIV testing intentions among university students based in order to contribute to the knowledge gap regarding HIV testing behavior and to test the applicability of the Health Belief Model in Ethiopia.

I kindly ask you to respond to all the questions in this questionnaire. I would like to remind you once again that all the information you are providing is confidential and is not linked to you in any way. You cannot be identified from any of your responses.

Please encircle the number of your best answer from the choices given under each question. If you want to change your answer please put an "X" mark on the previous answer and encircle on your new choice.

Thank you for your time and interest. You are making a valuable contribution to the future health of the citizens of our country.

SN	Questions	Responses
A	**Socio-demographic characteristics**	
1	Age in years	
2	Gender	1. Male 2. Female
3	Ethnicity	1. Oromo 2. Amhara 3. Tigrie 4. Other specify_____
4	Religion	1. Orthodox Christian 2. Muslim

			3. Protestant Christian
			4. Catholic Christian
			5. Other specify_____
5	Marital status		1.Single
			2. Married
			3.Divorced
			4. Widowed
6	Class Year		1. Year I
			2. Yea II
			3. Year III
			4. Year IV or more
7	Department/course enrolled in		
8	Place of growth		2. Rural setting 2. Urban setting
B	**Comprehensive knowledge about HIV/AIDS:** Please respond to the following questions by choosing "Yes" or "No" to the following questions		
1	HIV can be prevented by using condom		3. Yes 4. No
2	HIV can be prevented by limiting sexual intercourse to one uninfected partner		3. Yes 4. No
3	A healthy looking person can have the AIDS virus		3. Yes 4. No
4	The HIV virus can be transmitted by mosquito bites		3. Yes 4. No
5	The HIV virus can be transmitted by supernatural means		3. Yes 4. No
C	HBM constructs : Likert scale		

	Perceived susceptibility	
1	I am afraid that I might contract HIV	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
2	I believe that there is a chance that I might be infected with HIV/AIDS in the next one year	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
3	I believe that I might get HIV even if I am having sex with only one partner	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
4	I believe that I might be infected with HIV if my sex partner is having unsafe sex with others	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
5	I believe that I might be infected with HIV even if I am using condom	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
	Perceived Severity	
1	I believe that HIV/AIDS is non-curable disease	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
2	If incase I am infected with HIV, I am afraid that HIV/AIDS couldcause death to me	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
3	If incase I am infected with HIV, I am afraid that HIV/AIDS could cause disability to me	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
4	If I am infected with HIV, I believe that HIV/AIDS could disrupt my family or social or economic activities	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
5	If I am infected with HIV, I believe that it could cause psychological problem to me	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
6	I would rather have any other terminal illness than AIDS	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
7	I would rather die from a violent death(e.g. gun shot, car accident, etc) than from AIDS	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
	Perceived benefit	
1	I believe that HIV testing will provide me the option to know my HIV status and get emotional relief	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
2	I feel that HIV testing will help me plan to avoid infection in the future	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
3	HIV testing provides me the option to get early treatment before getting seriously sick	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
4	I believe that I can plan my future with full confidence through knowing my HIV status	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
5	I believe that HIV testing would help me not to transmit HIV to others if incase I had HIV	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
6	I believe that HIV testing help me identify my sexual partner based on her/his HIV status	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree

		Perceived barrier	
	1	I am afraid of hearing HIV positive result by undergoing HIV testing	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
	2	I am afraid of the stigma attached to HIV positive result	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
	3	I am afraid of separation from my friends and families due to my HIV positive result	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
	4	I don't want to wait long time at HIV testing facilities in order to have HIV testing	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
	5	I am embarrassed to ask for HIV testing at HIV testing facilities	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
	6	I am worried about confidentiality at HIV testing facilities	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
	7	I am afraid that I may lose my partner if my HIV test result turned outto be positive	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
	8	I don't want anyone to know that I'm sexually active/ at risk	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
	9	I am afraid that people may talk about me if I go to a health facility for HIV testing	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
	10	I will have to wait for long time for the HIV test result	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
		Perceived self-efficacy	
	1	For me it would be easy to have HIV testing performed	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
	2	I am confident that I can convince my girl/boyfriend to go for HIV testing	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
	3	I am confident that I can deal with health workers who are providing HIV testing services in order to get tested	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
	4	I am confident that I can manage the physical pain and effects of HIV/AIDS from interfering with my daily life and future plans in case of positive result	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
	5	I am confident that I can manage the emotional disturbances caused by HIV positive result from interfering with my normal daily life and future plans in case of positive result	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
		Cues to action	
	1	I recall seeing TV or billboards or posters or messages about the importance of HIV testing during the past one year	1. Disagree 2. Don't know 3. Agree
	2	During the past one year, I have received advice from a health professional about HIV testing	1. Disagree 2. Don't know 3. Agree
	3	My girlfriend/boyfriend usually thinks that it is good if I am tested for HIV	1. Disagree 2. Don't know 3. Agree

4	My parents insisted that I should be tested for HIV	1. Disagree 2. Don't know 3. Agree
5	I know people close to me who are ill with HIV/AIDS	1. Disagree 2. Don't know 3. Agree
6	I was asked to get tested for HIV as a requirement to donate blood or to go to abroad or other circumstances	1. Disagree 2. Don't know 3. Agree
	HIV testing history	
1	Have you ever been tested for HIV?	1. Yes 2. No
2	Have you been HIV tested during the past one year?	1. Yes 2. No
3	If Yes question number 2, Have you heard or received the result of HIV test	1. Yes 2. No
	HIV testing intentions	
1	I have ever thought about getting HIV testing	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
2	How likely are you in need of HIV counseling and testing service the next time you go for health care services?	1. Not likely at all 2. Less likely 3. Don't know 4. Likely 5. Very likely
3	How likely are you to accept HIV testing if you are requested to get tested for HIV the next time you go for health care services	1. Not likely at all 2. Less likely 3. Don't know 4. Likely 5. Very likely
4	How likely are you to get tested for HIV in the next three months?	1. Not likely at all 2. Less likely 3. Don't know 4. Likely 5. Very likely
5	How likely are you to do regular HIV testing in the future?	1. Not likely at all 2. Less likely 3. Don't know 4. Likely 5. Very likely

APPENDIX O: The final HTBS scale ready for crossectional survey - Amharic version

የዩኒቨርሲቲ ተማሪዎችን የኤት አይ ቪ ኤድስ የመመርመር ባህሪ/ተግባር   የሚወስኑ ሁኔታዎችን ለማወቅ የተደረገ ጥናት፤

የጤና ባህሪ አመለካከት ሞዴልን(THE HEALTH BELIEF MODEL) በመጠቀም የተደረገ ጥናት

በተማሪዎች የሚሞላ መጠይቅ

መግቢያ

በቅድሚያ በዚህ ጥናት ለመሳተፍ ፍቃደኛ ስለሆኑ ክልብ የሆነ ምስጋናዬን አቀርባለሁ፤   ስሜ ዘላለም መሐሪ አለማየሁ እባላለሁ፤ በደቡብ አፍሪካ ዩኒቨርሲቲ(University of South Africa-UNISA) የዶክተሬት ዲግሪ ተማሪ ነኝ፤ ይህ ጥናት ትምህርቴን ለማጠናቀቅ የማካሂደው አንዱ እና ዋናኛ አካል ሲሆን ፤ ይህም ትምህርቴን በብቃት ለማጠናቀቅ ከፍተኛ አስተዋፅኦ ይኖረዋል፤

በዚህ መጠይቅ ውስጥ የተካተቱት ጥያቄዎች በሙሉ የጥናቱን ጥያቄዎች ለመመለስ አስፈላጊ ስለሆኑ ሁሉንም ጥያቄዎች እንዲመልሱ በትህትና እጠፀናለሁ፤

በዚህ ቃለመጥይቅ ላይ የእርሶን ማንነት የሚገልፅ (ለምሳሌ ስምና የመሳሰሉትን መረጃዎች) ስለማይጠፉ ሚስጥራዊነቱ በፅኑ የተጠበቀ ነው፤

እባክዎትን የመረጡትን መልስ በመክበብ ያሳዩ፤ ሀሳቦትን ከፍየሉ የተሳሳተው መልስ ላይ የኤክስ ምልክት(X) ካደረጉ በኋላ ፤ ትክክለኛውን መልስ ያክብቡ፤

ጥያቄዎቹን ሞልተው ሲጨርሱ መጠይቁን ለማስቀመጥ ወደ ተዘጋጀው ቦታ ያኑሩት፤

በድጋሚ ግዜዎትን ስጥተው ይህን መጠየቅ ለመሙላት ፍቃደኛ በመሆኖ ከፍተኛ ምስጋና አቀርባለሁ፤

ከጥናቱ ጋር በተያያዘ ጥያቄ ወይም ቅሬታ ካልዎት ፤ በእነዚህ አድራሻዎች ጥያቄዎትን ማቅረብ ይችላሉ፤ - (ስልክ 0913517820; e-mail: zelalemmeharia@yahoo.com)

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ተቁ	ጥያቄዎች /መጠይቆች	የእርሶ ምላሾች
ሀ	የግለሰባዊና ማህበራዊ መረጃዎች	
1	እድሜ(በአመት ይፃፉ)	
2	ፆታ	1 ወንድ 2 ሴት
3	ብሄር	1 ኦሮሞ 2 አማራ 3 ትግሬ 4 ሌላ ከሆነ ይፃፉ፤_____

4	ሓይማኖት	1 አርቶዶክስ ክርስቲያን
		2 ሙስልም
		3 ፕሮቴስታንት ክርስቲያን
		4 ካቶሊክ ክርስቲያን
		5 ሌላ ከሆነ
		ይፃፉ_____
5	የጋብቻ ሁኔታ	1 ያላገባ
		2 ያገባ
		3 የተፋታ
		4 የሞተበት
6	ስንተኛ እመት ተማሪ ነዎት	1 አንደኛ
		2 ሁለተኛ
		3 ሦስተኛ
		4 አራተኛ እና ከዚያ በላይ
7	ዲፓርትመንትዎን(የትምህርት ክፍልን) ይፃፉ	
8	ያደጉበት አካባቢ የት ነው	1 ገጠር
		2 ከተማ
ለ	የ ኤት አይ ቪ ኤድስ ጠቅላላ እውቀት ምዘና	
1	ኤት አይ ቪ ኤድስን ኮንዶም በመጠቀም መከላከል ይቻላል::	1 አዎ
		2 አይደለም
2	እንድ ለእንድ በመወሰን ኤት አይ ቪ ኤድስን መከላከል ይቻላል::	1 አዎ
		2 አይደልም
3	ጤናማ የሚመስል ሰው ኤት አይ ቪ ኤድስ ሊኖረበት ይችላል::	1 አዎ
		2 አይደልም

4	የኤት አይ ቪ ኤድስ ቫይረስ በወባ ትንኝ ንክሻ ሊተላለፍ ይችላል::	1 አዎ 2 አይደለም				
5	የኤት አይ ቪ ኤድስ ቫይረስ በፈጣሪ ቁጣ ወይም በሌላ አንዳች ሀይል ሊመጣ ይችላል::	1 አዎ 2 አይደለም				
ሐ	**የ THE HEALTH BELIEF MODEL መለኪያዎች** የሚከተሉትን አረፍተ ነገሮች በጥሞና ካነበቡ በኋላ በዐረፍተ ነገሩ ውስጥ የተመለከተው ሃስብ ጋር መስማማትና አለመስማማዎትን በምርጫው ውስጥ ከተመለከቱት አማራጮች እንዱን ይመረጡ					
	ክፍል 1					
1	ኤት አይ ቪ ኤድስ በአንድም ወይም ቤሌላ መንገድ እንዳይዘኝ እፈራለሁ::	1 በፍፁም አልስማማም	2 አልስማማም	3 አላወስንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ
2	በሚቀጥለው እንድ አመት ውስጥ ለኤት አይቪ ኤድስ የመጋለጥ እድል ምናልባት ሊያጋጥመኝ ይችላል::	1 በፍፁም አልስማማም	2 አልስማማም	3 አላወስንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ
3	ምንም እንኳን እንድ የግብረስጋ ግንኙነት ጓደኛ ቢኖረኝም በኤት አይ ቪ ኤድስ የመያዝ አጋጣሚ ሊኖረኝ ይችላል::	1 በፍፁም አልስማማም	2 አልስማማም	3 አላወስንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ
4	የፍቅር ጉዳኛዬ ጥንቃቄ የሂደለው ግብረ ስጋ ግንኙነት ከሌላ ሰው ጋር የሚፈፅም:: ወይም የምትፈፅም ከሆነ በኤ ች አይ ቪ ኤድስ የመያዝ እድል ሊኖረኝ ይችላል	1 በፍፁም አልስማማም	2 አልስማማም	3 አላወስንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ
5	ምንም እንኳን ኮንዶም ሁሌም እና በትክክል ብጠቀምም ለኤች አይ ቪ ኤድስ የመያዝ አጋጣሚ ሊኖረኝ ይችላል::	1 በፍፁም አልስማማም	2 አልስማማም	3 አላወስንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ
	ክፍል 2					
1	ኤች አይ ቪ ኤድስ ፍቱን መድኃኒት ያልተገኘለት በሽታ ነው::	1 በፍፁም አልስማማም	2 አልስማማም	3 አላወስንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ
2	ኤች አይ ቪ ኤድስ ገዳይ በሽታ ነው::	1 በፍፁም አልስማማም	2 አልስማማም	3 አላወስንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ
3	ኤች አይ ቪ ኤድስ በአካል እና በአእም ላይ ዘላቂ ጉዳት ሊያስከትል ይችላል::	1 በፍፁም አልስማማም	2 አልስማማም	3 አላወስንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ
4	በኤት አይ ቪ ኤድስ ብያዝ ከጤና ጠንቅነት በሻጋ ማህበራዊ እና	1 በፍፁም አልስማማም	2 አልስማማም	3 አላወስንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ

	ኢኮኖሚያዊ ቀውስ ሊያደርስብኝ ይችላል::					
5	በኤት አይ ቪ ኤድስ ብ� ስንልቦናዊ ቀውስ ሊያስከትልብኝ ይችላል::	1 በፍፁም አልስማማም	2 አልስማማም	3 አለወሰንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ
6	በኤች አይ ቪ ኤድስ ከማያገዝ ቤሌ አደገኛ በሽታ ብ449 እመርጣለሁ::	1 በፍፁም አልስማማም	2 አልስማማም	3 አለወሰንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ
7	በኤች አይ ቪ ኤድስ ከማሞት በሌሎች አደጋዎች ለምሰሌ በመኪና አደጋ ወይም በጥይት ብሞት ይሻለል::	1 በፍፁም አልስማማም	2 አልስማማም	3 አለወሰንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ
	ክፍል 3					
1	ኤች አይ ቪ ኤድስ ተመርምሬ እራሴን ባውቅ እፎይታ ይሰማኛል ብዬ አምናለሁ::	1 በፍፁም አልስማማም	2 አልስማማም	3 አለወሰንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ
2	ኤች አይ ቪ ኤድስ በመመርመር ለወደፊቱ በበሽታው እንዳልያዝ መጠንቀቅና ማቅድ ያስችለኛል::	1 በፍፁም አልስማማም	2 አልስማማም	3 አለወሰንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ
3	ኤች አይ ቪ ኤድስ በመመርመር በወቅቱ በሽታው ከፍተኛ ደረጃ ሳይደርስ ለመታከም ያስችለኛል ብዬ አስባለሁ::	1 በፍፁም አልስማማም	2 አልስማማም	3 አለወሰንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ
4	ኤች አይ ቪ ኤድስ በመመርመር የወደፊት ህይወቴን በልብ ሙሉነትና በኮንፊደንስ ማቅድ ያስችለኛል::	1 በፍፁም አልስማማም	2 አልስማማም	3 አለወሰንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ
5	ኤች አይ ቪ ኤድስ በመመርመር በሽታው ወደ ሌሎች ሰዎች እንዳይተላለፍ ለማድረግ ይረዳኛል ብዬ አምናለሁ::	1 በፍፁም አልስማማም	2 አልስማማም	3 አለወሰንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ
6	ኤች አይ ቪ ኤድስ መመርመር የወደ ፊት የፍቅር ጓደኛዬን ለመለየት ይረዳኛል ብዬ አምናለሁ::	1 በፍፁም አልስማማም	2 አልስማማም	3 አለወሰንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ
	ክፍል 4					
1	በኤች አይ ቪ ኤድስ ምርመራ ቫይረሱ እንዳይገኝብኝ ስለምስጋ የኤች አይ ቪ ኤድስ ምርመራ ማድረግ አፈራለሁ::	1 በፍፁም አልስማማም	2 አልስማማም	3 አለወሰንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ
2	ከኤች አይ ቪ ኤድስ ጋር በተገናኘ ያለው መገለል እና መድልዎ ኤች አይ ቪ ኤድስ እንዳልመረመር ያደርገኛል ብዬ እሰጋለሁ::	1 በፍፁም አልስማማም	2 አልስማማም	3 አለወሰንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ

3	በኤች አይ ቪ ኤድስ ምርመራ ውጤቴ ምክንያት ከቤተሰቦቼ ወይም ከጓደኞቼ በኩል የመገለል ችግር እንዳይደርስብኝ እፈራለሁ::	1 በፍጹም አልስማማም	2 አልስማማም	3 አላወስንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ
4	የኤች አይ ቪ ኤድስ ምርመራ ለማካሄድ በጤና ተቋም ብዙ ሰዓት መጠበቅ አልፈለገም::	1 በፍጹም አልስማማም	2 አልስማማም	3 አላወስንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ
5	ለኤች አይ ቪ ኤድስ ምርመራ ጤና ተቋም መሄድ አፈራለሁ::	1 በፍጹም አልስማማም	2 አልስማማም	3 አላወስንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ
6	በጤና ተቋማት የሚሰጠውን የኤች አይ ቪ ኤድስ ምርመራ ምስጢራዊነት እጠራጠራለሁ::	1 በፍጹም አልስማማም	2 አልስማማም	3 አላወስንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ
7	በኤች አይ ቪ ኤድስ ምርመራ ውጤቴ ምክንያት የፍቅር ጓደኛዬን እንዳላጣ እፈራለሁ::	1 በፍጹም አልስማማም	2 አልስማማም	3 አላወስንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ
8	የግብረስጋ ግንኙነት እንደጀመርኩና ለኤች አይ ቪ ተጋላጭ እንደሆንኩ ሰዎች እንዲያውቁ ስለማልፈልግ ኤች አይ ቪ ኤድስ መመርመር አፈራለሁ::	1 በፍጹም አልስማማም	2 አልስማማም	3 አላወስንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ
9	ለኤች አይ ቪ ኤድስ ምርመራ መሄዴን ሰዎች እንዳያወሩብኝ አፈራለሁ::	1 በፍጹም አልስማማም	2 አልስማማም	3 አላወስንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ
10	የኤች አይ ኤድስ ምርመራ ጣቢያዎች ብዙ ሰዓት እንዳያቆዩኝ አፈራለሁ::	1 በፍጹም አልስማማም	2 አልስማማም	3 አላወስንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ
ክፍል 5						
1	የኤች አይ ቪ ኤድስ ምርመራ በቀላሉ ማድረግ እችላለሁ::	1 በፍጹም አልስማማም	2 አልስማማም	3 አላወስንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ
2	የፍቅር ጉዳዬን አሳምኜ ወደ ኤች አይ ቪ ኤድስ ምርመራ መሄድ እንችላለን ብዬ አምናለሁ::	1 በፍጹም አልስማማም	2 አልስማማም	3 አላወስንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ
3	የኤች አይ ቪ ኤድስ ምርመራ ከሚሰጡ ባለሞያዎች ጋር በግልፅ መነጋገር	1 በፍጹም አልስማማም	2 አልስማማም	3 አላወስንኩም	4 እስማማለሁ	5 እጅግ በጣም እስማማለሁ

	አይከበበደኝም::				
4	በኤች አይ ቪ ኤድስ ብ" ዪዝ በበሽታው ሊመጣ የሚችለውን አካላዊ ህምም የአለት ተእለት ኑሮዬን እንዳይረብሽ ምን ማድረግ እንዳለብኝ አውቃለሁ::	1 በፍጹም አልስማማም	2 አልስማማም	3 አልወሰንኩም	4 እስማማለሁ	5 እጅግ በጣም አስማማለሁ
5	በኤች አይ ቪ ኤድስ ብ" ዪዝ በበሽታው ሊመጣ የሚችለውን ስነልቦናዊና አእመሮአዊ ጉዳት የአለት ተእለት ኑሮዬን እንዳይረብሽኝ ምን ማድረግ እንዳለብኝ አውቃለሁ::	1 በፍጹም አልስማማም	2 አልስማማም	3 አልወሰንኩም	4 እስማማለሁ	5 እጅግ በጣም አስማማለሁ
	ክፍል 6				
1	በተለያዩ የሚዲያ ውጤቶች ላይ ለምሳሌ በሬዲዮ፡ ቴሌቪዥን፡ በህትመት ሚዲያዎች በቢል ቦርድ ኤች ይ ቪ ኤድስ ምርመራን የሚያበረታቱ መልእክቶችን ማየቴን አስታውሳለሁ::	1 በፍጹም አላስታውስም	2 አላስታወስም	3 በጣም አስታውሳለሁ		
2	ባለፈው አንድ ዓመት ውስጥ በጤና ባለሞያ የኤች አይ ቪ ምርመራ እንዳደርግ ምክር ተለግሶኛል::	1 በፍጹም አላስታውስም	2 አላስታወስም	3 በጣም አስታውሳለሁ		
3	የፍቅር ጓደኛዬ ኤች አይ ቪ ኤድስ እንድመረመር ይገፋፋኛል ወይም ትገፋፋኛለች::	1 በፍጹም አላስታውስም	2 አላስታወስም	3 በጣም አስታውሳለሁ		
4	ቤተሰቦቼ ወይም ወላጆቼ ኤች አይ ቪ እንድመረመር ያበረታቱኛል::	1 በፍጹም አላስታውስም	2 አላስታወስም	3 በጣም አስታውሳለሁ		
5	በኤች አይ ቪ ኤድስ የተያዘ በቅርበት የማውቀው ሰው አለ::	1 በፍጹም አላስታውስም	2 አላስታወስም	3 በጣም አስታውሳለሁ		
6	እንዳንድ ኤች አይ ቪ ለመመርመር የሚያስገድዱ ሁኔታዎች(ለምሳሌ ደም ለመለገስ ወይም ውጭ ሀገር ለመሄድ) አጋጥሞኝ ያውቃል::	1 በፍጹም አላስታውስም	2 አላስታወስም	3 በጣም አስታውሳለሁ		
	ክፍል 7				
1	ኤች አይ ቪ ኤድስ ተመርምረው ያውቃሉ?	1 አዎ 2 አይደለም				

2	ባለፈው አንድ ዓመት ውስጥ ኤች አይ ቪ ኤድስ ተመርምረው ያውቃሉ?	1 አዎ	2 አይደለም			
3	ባለፈው አንድ ዓመት ውስጥ ኤች አይ ቪ ኤድስ ተመርምረው ከሆነ የኤች አይ ቪ ምርመራ ውጤትዎን ሰምተው ወይም ተቀብለው ነበር ወይ?	1 አዎ	2 አይደለም			
	ክፍል 8					
1	ኤች አይ ቪ ኤድስ ለመመርመር አስቤ አውቃለሁ::	1 በፍፁም	2 እንዳንዴ	3 አላስታውስም	4 በጣም	5 እጅግ በጣም
2	በሚቀጥለው ጊዜ ወደ ጤና ድርጅት ቢሄዱ ኤች አይ ቪ ኤድስ ምርመራ ለማግኘት ያልዎት ፍላጎት ምን ይመስላል?	1 በጣም አነስተኛ	2 አነስተኛ	3 አላውቅም	4 ከፍተኛ	5 በጣም ከፍተኛ
3	በሚቀጥለው ጊዜ ጤና ድርጅት ቢሄዱ የኤች አይ ቪ ኤድስ የምርመራ አገልግሎት ቢሰጥዎት የመቀበል ፈለጎቶው ምን ይመስላል?	1 በጣም አነስተኛ	2 አነስተኛ	3 አላውቅም	4 ከፍተኛ	5 በጣም ከፍተኛ
4	በሚቀጥሉት ሶስት ወራት ውስጥ ኤች አይ ቪ ኤድስ የመመርመር አቅድዎትንና ፈለጎትዎትን እንዴት ያዩታል?	1 በጣም አነስተኛ	2 አነስተኛ	3 አላውቅም	4 ከፍተኛ	5 በጣም ከፍተኛ
5	ለወደ ፊቱ በመደበኛ መልኩ የ ኤች አይ ቪ ኤድስ ምርመራ ለማካሄድ ያለዎት ፍላጎት ምን ይመስላል?	1 በጣም አነስተኛ	2 አነስተኛ	3 አላውቅም	4 ከፍተኛ	5 በጣም ከፍተኛ

ይህን ቃለመጠይቅ ለመሙላት ስለሰጡን ጊዜ እጅግ በጣም አድርገን እናመሰግናለን!!!

APPENDIX P: Consent form for the crossectional survey and pilot study

CONSENT TO PARTICIPATE IN A SURVEY OF THE
APPLICATION OF THE HEALTH BELIEF MODEL (HBM) TO PREDICT VOLUNTARY HIV TESTING BEHAVIOR AMONG UNIVERSITY STUDENTS IN ETHIOPIA

You are kindly asked to participate in a research study conducted by Zelalem Mehari Alemayehu, a doctoral student at University of South Africa (UNISA).

If you have any questions or concerns about the research, please feel free to contact the investigator: Zelalem Mehari Alemayehu (e-mail: zelalemmehaia@yahoo.com, Tele: +251 913 51 7820).

PURPOSE OF THE STUDY

The aim of this research is to explore and analyze HIV testing behavior and intentions among university students based on the Health Belief Model in order to contribute to the knowledge regarding HIV testing behavior and to test the applicability of the model in the Ethiopian context.

PROCEDURES

If you volunteer to participate in this study, you will be asked to complete the self-administered questionnaire which will take you not more than half hours. You cannot be identified through your responses.

Research findings will be available to you through publication or your university.

POTENTIAL RISKS AND DISCOMFORTS

There is no anticipated significant risk or discomfort related to participating in this survey. There might be minor discomfort attached to answering some sensitive questions. If you experience discomfort and wish to receive psychological and social support, please contact the investigator of the study for a referral.

POTENTIAL BENEFITS TO PARTICIPANTS AND/OR TO SOCIETY

There is no direct benefit that is gained by you from attending in this research. However, the results of this study can contribute to the knowledge regarding HIV testing behavior in university students and help in designing HIV testing programs in university settings in Ethiopia.

PAYMENT FOR PARTICIPATION

Participation on this study is based on volunteerism and there is no payment for participating in this study.

CONFIDENTIALITY

The self-administered questionnaire is anonymous and your identity cannot be linked to your responses. The completed data will be stored in a locked cabinet for five years and will be destroyed after five years. Only electronic copies of the data will be kept with passwords after five years. The result of the study will be communicated through journals or other outlets.

PARTICIPATION AND WITHDRAWAL

You can choose whether to be in this study or not. If you volunteer to be in this study, you may withdraw at any time without consequences of any kind.

RIGHTS OF RESEARCH PARTICIPANTS

You may withdraw your consent at any time and discontinue participation without penalty. You are not waiving any legal claims, rights or remedies because of your participation in this research study. This study has been reviewed and received ethical clearance through the UNISA and Ethiopian Ministry of science and technology ethics committees.   If you have questions regarding your rights as a research participant, please contact the investigator of the study.

SIGNATURE OF RESEARCH PARTICIPANT/LEGAL REPRESENTATIVE

I have read the information provided for the study as described herein. My questions have been answered to my satisfaction, and I agree to participate in this study.

Name and signature of Participant_____

Date   _____

APPENDIX Q: Survey data collection facilitation guide

Guides for data collection facilitators the crossectional survey

1. Concerned officials will be contacted and official letter and ethical clearance will be submitted to the university. Make sure that the university has consented for the conduct of the study. Ethical clearance letter from UNISA and Ministry of Science and Technology (MOST) will be submitted.

2. Sampling procedure and sample allocation

SN	Information to be compiled from registrar office of the university	Values	Remark
1	# of faculties/colleges(write names of all colleges in the below open spaces)	9	
	College of Agriculture and Natural Resource Science, College of Business and Economics, College of Computing Sciences, College of Engineering, College of Health Science, College of Law, College of Natural and Computational Science, College of Social Science and Humanities and College of Medicine		
2	Total # of students enrolled in the regular undergraduate programs in:		
	• Year I	3325	
	• Year II	2822	
	• Year III	2846	
	• Year IV and plus	1654	
3	Total number of departments for undergraduate in(write names of department in the table annexed below):		
	• Year I	33	
	• Year II	33	
	• Year III	32	
	• Year IV+	17	
4	Allocate 614 to class years based on PPS(SN-2)		
	• Year I	192	
	• Year II	163	
	• Year III	164	
	• Year IV+	95	
5	Calculate average number of students under each departments (Total # of students under each class year(SN-2) divided by total # of departments(SN-3))		
	• Year I	101	
	• Year II	86	
	• Year III	89	
	• Year IV+	97	
6	Calculate how many departments do we need to select from each class year(Divide allocated class year for each class year(SN-4) by average under each class year(SN-5)		
	• Year I	4	
	• Year II	3	
	• Year III	3	
	• Year IV+	2	
7	Select departments by lottery method based on information from SN-6 and list under each class year		

	Year I: Information Technology, Sociology, Psychology, Midwifery
	Year II: Nursing, Law, Psychology, Health Officer
	Year III: Construction tech and management , Health officer, sport science
	Year IV+: Construction tech and management

3. Data collection procedures

- The data collection facilitators will have adequate number of unfilled questionnaire and consent form for each participant before going for the survey.
- Have contacts of student representatives/teachers so as to figure out class schedules of selected students.
- Negotiate with instructors or/and student representatives so that they will inform students about the research and facilitate some time for the survey. Make sure that students are in their class during the data collection.
- The data collection facilitators will explain purpose of the study and instruction for filling out the self-administered questionnaire to class of students whose class will be randomly selected for the study. Data collection facilitators will underline and beg students not to provide false information since the result of this study would inform further conduct of research and program implementation.
- Verbal consent will be obtained and questionnaire will be administered. Students have the right to decline from participating in the study.   And those who wanted to sign on the written informed consent will be appreciated to do so.
- After verbal consent is obtained or the signed consent form was collected , the students will be provided with self-administered scale and the data collection facilitators will provide brief orientation on how to fill out the scale(see cover page of the questionnaire).
- A completed questionnaire won't be collected by the facilitators but the students themselves will put the completed questionnaire at the corner prepared for this purpose. You may ask them to put on a table/chair put aside for this purpose. This will ensure that students will be assured that no one will trace their information.

4. Completed Questionnaire handling

- Pack completed questionnaire and lock in a safe place
- Make sure that you have collected at least 614 completed questionnaire and consent forms

5. Keep daily notes of what happened during the whole process of sampling and data collection that could have implications(positive/negative) on the quality of the data and summarize in the below formats:
- Data collection dates:
- Summary of key issues encountered during sampling
- Summary of key issues encountered during data collection process
- Key remedies taken

Lists of departments under each class year (select by lottery from the list below)

Year I	Year II	Year III	Year IV+
		264	