

THE KNOWLEDGE OF AND ATTITUDES TOWARDS HIV/AIDS AMONG POST-
SECONDARY STUDENTS IN A SOUTHERN ETHIOPIAN CITY

THE KNOWLEDGE OF AND ATTITUDES TOWARDS HIV/AIDS AMONG POST-
SECONDARY STUDENTS IN A SOUTHERN ETHIOPIAN CITY

By

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Abstract

Introduction: The HIV/AIDS epidemic continues to claim millions of lives worldwide. Africa alone represents the majority of HIV/AIDS cases, where the young aged 16-30, are at greatest risk. In Ethiopia, the research suggests that knowledge of HIV transmission and positive attitudes among post-secondary students are decreasing. The purpose of this research is to explore the knowledge and attitudes of HIV/AIDS among post-secondary students in a southern Ethiopian city.

Methods: A cross-sectional study was conducted among 227 college and university students. The AIDS Attitude Scale and the HIV Knowledge Questionnaire were used to measure participants' knowledge and attitudes on HIV/AIDS. Descriptive statistics, t-test, correlation and regression analysis were used for analysis.

Results: The results from the HIV Knowledge Questionnaire revealed lower knowledge on the various sexual modes of HIV transmission. The t-test demonstrated no difference between male and female HIV knowledge scores ($t=0.6$, $df=225$, $p=0.4$). The correlation analysis indicated a significant negative relationship between HIV knowledge scores and avoidant AIDS attitude scores ($r=-0.2$, $p<0.01$). The linear regression demonstrated for every one unit increase of AAS avoidant scores, HIV knowledge scores decreased 0.7 units ($p<0.01$); suggesting that students who scored higher in negative attitudes, achieved lower scores on HIV knowledge levels.

Conclusion: The study findings demonstrate the call to address this knowledge gap among a known population vulnerable to risky sexual behavior. Future research is

needed such that HIV/AIDS awareness campaigns can be specifically tailored to the student population within the Ethiopian context.

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Table of Contents

Chapter 1.	
Introduction	1
1.1 Background on HIV/AIDS.....	1
1.2 Rationale for Study.....	2
1.3 The Ethiopian Context at a Glance.....	3
1.3.1 Geography.....	4
1.3.2 Economy.....	5
1.3.3 Demographics.....	6
1.3.4 Health issues.....	7
1.4 HIV/AIDS in Ethiopia and Relevance.....	8
1.5 Conclusion.....	10
Chapter 2. Literature Review	11
2.1 Knowledge and Attitudes of HIV/AIDS among Ethiopian Students Criteria for Selecting Studies.....	12
2.2 Cultural Gender Identity and HIV/AIDS.....	13
2.3 Theory Exploration.....	15
2.3.1 The social theory of gender and power	17
2.4 Knowledge Transfer and HIV/AIDS.....	18
2.4.1 Rationale for knowledge transfer framework.....	18
2.6 Conclusion.....	20
Chapter 3. Methods	22
3.1 Methods.....	22
3.1.1 Purpose and rationale.....	22
3.2 Research Questions.....	23
3.2.1 Hypotheses.....	23
3.3 Gaining Entry.....	24
3.4 Ethical Considerations.....	24
3.5 Research Design.....	25
3.6 Setting.....	25
3.7 Participants.....	25
3.8 Sampling.....	26
3.9 Data Collection Process.....	27
3.10 Data Collection Instruments.....	28
3.1.1 HIV/AIDS knowledge questionnaire.....	28
3.1.2 HIV/AIDS attitude scale.....	29
3.12 Methods of Analysis.....	30
3.13 Conclusion.....	31
Chapter 4. Results	32
4.1 Demographics Results.....	32

4.2 HIV-KQ-18 Results.....	33
4.3 AAS Results.....	35
4.4 Difference in HIV-KQ-18 Scores among Male and Female Students.....	37
4.5 Difference in AAS Scores among Male and Female Students.....	37
4.6 Association between HIV-KQ-18 Scores and AAS Scores.....	38
4.7 Relationship Strength between HIV-KQ-18 Scores and AAS Scores.....	38
4.8 Conclusions.....	39
Chapter 5. Discussion.....	40
5.1 Student Demographics.....	40
5.2 Students' AAS Scores and Significance.....	42
5.3 Students HIV-KQ-18 Scores and Significance.....	44
5.4 Relationship between AAS Avoidant Scores and Lower HIV-KQ-18 Scores.....	45
5.5 Significance of HIV-KQ-18 Scores between Male and Female Students.....	46
5.6 Connection to Theoretical Framework.....	49
5.7 Limitations.....	50
5.8 Conclusions.....	52
Chapter 6. Implications, Conclusion and Reflection.....	54
6.1 Implications.....	54
6.2 Conclusion.....	56
6.3 Self-Reflective Journey.....	58
References.....	60
Appendices.....	82

List of Tables

Appendix A: HIV Determinant Framework

Appendix B: Map of Ethiopia

Appendix C: The Ottawa Model of Research Use

Appendix D: Assessing Country-Level Efforts to Link Research to Action Framework

Appendix E: Demographic Questionnaire

Appendix F: The HIV Knowledge Questionnaire

Appendix G: The AIDS Attitude Scale

Table 1: Demographic Results

Table 2: The HIV Knowledge Questionnaire Results

Table 3: The AIDS Attitude Scale Results

Figure 1: HIV Knowledge Scores among Male and Female Students

Figure 2: AAS Avoidant Scores among Male and Female Students

Figure 3: Regression Coefficients for HIV Knowledge and Avoidant Attitude Scores

List of Abbreviations

AIDS Attitude Scale (AAS)

Acquired Immune Deficiency Syndrome (AIDS)

Assessing Country-Level Efforts to Link Research to Action (ACLELRA)

Anti-Retroviral Therapy (ART)

Center of Intelligence Agency (CIA)

Federal Ministry of Health (FMOH)

Gross Domestic Product per capita (GDP)

HIV/AIDS Prevention Control Office (HAPCO)

Human Development Index (HDI)

Human Immunodeficiency Virus (HIV)

HIV Knowledge Questionnaire (HIV-KQ-18)

Health Service Extension Program (HSEP)

Information Communication Technologies (ICT)

International Development Research Canada (IDRC)

Knowledge Translation (KT)

Low Middle-Income Countries (LMICs)

Millennium Development Goals (MDGs)

Ottawa Model of Research Use (OMRU)

People Living with HIV/AIDS (PLWHA)

Research Ethics Board (REB)

Regional East African Community Health (REACH)

MSc Thesis – M. Paul; McMaster – Nursing

Sexual Relationship Power Scale (SRPS)

Swiss Development Cooperation (SDC)

United Nations AIDS (UNAIDS)

United Nations Human Development Report (UNDP)

United Nations International Children’s Emergency Fund (UNICEF)

Declaration of Academic Achievement

The master's student, MP was the primary author of the research study. In collaboration with BM, MP and BM developed the research methods and design of the study. MP conducted the data collection with the help of TT and SM in Ethiopia. MP wrote the preliminary version of the document. BM, SB, NAD and DS revised the draft manuscript for academic acceptability and content. MP wrote the final manuscript and is the guarantor of the master's dissertation.

Chapter 1: Introduction

Background of HIV/AIDS

At a cellular level, the sero-transmission of Human Immunodeficiency Virus (HIV) is considered a biological process, whereby the virus attacks healthy immune cells leading to the fatal cascade of Acquired Immune Deficiency Syndrome (AIDS) (Martin & Quentin, 2009). However, the realm of susceptibility and vulnerability regarding the spread of HIV/AIDS encompasses larger societal processes than merely biological ones (Parker, Aggleton, Attawell, Pulerwitz, & Brown, 2002). Fourie and Schönteich (2002) argue the importance of employing a contextual lens in African HIV/AIDS research, as “...poverty, geographical displacement and regional conflicts have become the societal determinants that are fanning HIV infection on the continent” (p. 5). Therefore, the purpose of this introduction is to provide a rudimentary overview on the societal context of HIV/AIDS in Ethiopia rather than the biological processes.

According to the HIV Determinant Framework by Barnett, Whiteside and Decosas (2000) multiple factors interplay in determining the susceptibility of HIV/AIDS within a given context. For example, this framework highlights distal and proximal determinants as factors, which influence the spread of HIV/AIDS (see Appendix A). Distal determinants are categorized as the macro and micro-environmental factors, which affect risk through a longer period of time and thus have “...more variable, series of cause and effects than proximal factors” (Gupta, Parkhurst, Ogden, Aggleton & Mahal, 2008, p. 765). The macro-environment can include economic distribution, culture, religion and geography, while the micro-environment denotes factors such as

mobilization trends (rural to urban), accessibility of healthcare and women's status. The proximal determinants highlight the factors of behavior and biology. However, as mentioned, the biological and cellular processes of HIV are not the intent of this outline. The proximal determinants of behavior categorize important processes such as risky sexual behavior, which further increase HIV exposure and transmission (Barnett, et al., 2000). For example, Whiteside (2002) lists such risky behavior as the increase in multiple sexual partners or decreased condom use in polygamous relationships. This proximal determinant of behavior will be discussed further in the following chapter.

As a whole, the HIV Determinant Framework provides an operative paradigm to view the specific determining factors, which influence the spread of HIV/AIDS in a particular context (Whiteside, 2002). Thus, in order to effectively highlight the current trend of HIV/AIDS in Ethiopia, it is imperative to discuss the contextual factors that fuel this crisis (Gupta et al., 2008).

Rationale for the Study

Over the past three decades, HIV/AIDS has claimed the lives of more than 30 million Africans (Department of International Development, 2011). Currently, the African population represents almost 70% of total HIV cases worldwide where the majority are young Africans aged 16-24 (United Nations AIDS [UNAIDS], 2010). Specifically within Ethiopia, new HIV cases pose the greatest threat among young Ethiopians. According to Negash, Gebre, Benti and Bejiga, (2003) young Ethiopians are more vulnerable to HIV transmission due to increased sexual risk behaviors. These risky behaviors include increased multiple sexual partners and unprotected intercourse. Recent

literature demonstrates a higher proportion of HIV/AIDS cases within Ethiopian urban centers (HIV/AIDS Prevention Control Office [HAPCO], 2008). Studies suggest the target groups such as post-secondary (college and university) students are at increased risk of HIV transmission (Alene, Wheeler, & Grosskurth, 2004; Yerdaw, Nedi, Wheeler, & Grosskurth, 2004). Yet, few authors have comprehensively examined the knowledge and attitudes of HIV/AIDS among this vulnerable group. Therefore, the intent of this study is to explore the knowledge and attitudes of HIV/AIDS among post-secondary students in a southern Ethiopian city. The subsequent section will provide a rudimentary overview on the social context of Ethiopia and its relevance to HIV/AIDS rates in the country.

The Ethiopian Context at a Glance

The cultural identity of Ethiopia is known as one of the richest and oldest civilizations of the world. As the ancient empire of Abyssinia, Ethiopia remains one of two African nations to be sovereignly independent from colonial rule. In 1896, the historic battle of Adowa demonstrated Ethiopians resilience in its victory against Italy's attempted foreign invasion (Ethiopian Culture and Tourism Ministry, 2008). This ingenuity and strong sense of cultural identity continues to flourish in modern day Ethiopia. According to the Central Intelligence Agency (CIA), three principal crops are said to have originated in Ethiopia: coffee, sorghum grain, and the castor bean (2008). International tourism has increased by 50%, whereby hundreds of thousand of tourists travel each year to experience Ethiopia's historical architecture and landscape (Ethiopian Culture and Tourism Ministry, 2008). According to HAPCO (2008), Ethiopia is an

ethnically diverse country with more than 80 ethnic groups and 70 differing languages. The official language of Ethiopia is Amharic, a language of Semitic origins (CIA, 2008). According to the CIA (2008), 43.5% of Ethiopians practice Orthodox Christianity, followed by 33.9% of Muslim faith and 18.6 % of Protestant credence.

Geography.

Ethiopia is situated in the northeastern region of Africa, also referred to as the horn of Africa. Ethiopia is comprised of nine different geographical and ethnically diverse states (see Appendix B). After the De Jure independence of Eritrea, Ethiopia lost national access to the Red Sea port. In 1993 Ethiopia became a land locked country in 1993 (Economist Intelligence Unit, 2008). The borders of Ethiopia are shared by five other nations including Sudan, Eritrea, Djibouti, Somalia and Kenya.

Access to a sustainable water source remains a critical issue within the Ethiopian landscape. Severe drought and erratic weather patterns have contributed to years of famine and regional flooding in Ethiopia. According to the United Nations International Children's Emergency Fund (UNICEF), more than 75% of Ethiopia's communicable diseases stem from an un-sanitized water source only 31% of Ethiopian households have access to potable water (2007). Yet in contrast to these alarming trends, Ethiopia is considered a country abounding in natural resources. For example, the source of the Blue Nile is found in Northeastern Ethiopia. According to Postel and Wolf (2001), the Blue Nile contributes to 85% of the Nile's hydro capabilities. However, due to past treaties with Egypt and Sudan, Ethiopia is left with little ownership or usage of Blue Nile waters (Economist Intelligence Unit, 2008). For example, less than 5% of the Blue Nile's

irrigable land has been utilized for food production, and yet millions of Ethiopians face famine on a daily basis (Block, Strzepek & Rajagopalan, 2008). The geography of Ethiopia demonstrates a resourceful land in stark divide between abundance of its natural resources and the barriers preventing it from harnessing these resources.

Economy.

Ethiopia's agricultural farming accounts for nearly 85% of the population's livelihood. Over 90% of their national exports and nearly half of the country's Gross Domestic Product (Kloos, 1997). According to the World Bank (2006), Ethiopia's agronomy mainly consists of small-scale farms, which depend heavily upon rain-fed and traditional farming practices. Therefore, the majority of Ethiopia relies upon environmental-based commerce as a main source of income. However, due to years of drought and erratic weather patterns, millions of Ethiopian farms yield minimal return or financial profit. As a result, the primary sector of Ethiopia's economy is economically unsound.

According to the United Nations Human Development Report (UNDP), nearly 77% of Ethiopia's population makes less than two dollars a day and nearly half a million Ethiopians are dependent on external food aid (Oxfam, 2010). Furthermore, Ethiopia's Gross Domestic Product per capita (GDP) is ranked as one of the lowest in the world (171 out of 182 countries). Kloos (1997) purports Ethiopia to be one of the poorest countries not only in monetary terms but also in the areas of social capital and accessibility of essential services.

Demographics.

According to the UNDP (2009) Ethiopia is the second largest country in Africa (second to Nigeria), whereby the estimated population is 85.8 million. Furthermore, an Oxfam report (2010) states that almost 85% of Ethiopia's population resides in rural areas in comparison to only 15% of Ethiopian urban dwellers. As population growth steadily increases, 45% of Ethiopia's total population is below the age of 15 years (HAPCO, 2008). Among this young age group only 30% of school age children have access to formal education (UNICEF, 2009). A study by von Masow (2000) reports the worsening state of school conditions in rural Ethiopia whereby "...textbooks are shared between four to eight children, and some subjects have no textbooks at all. Average class sizes range from 80 to more than 100, with a sharp fall in attendance after grade 1" (p. 48). Several studies have suggested an association between the increasing issue of truancy among children and drought within Ethiopia's pastoral regions (Berhane, Gossayea, Emmelinb, & Hogbergb, 2001; Lautze, Aklilu, Raven-Roberts, Young, Kebede & Leaning, 2003; Salama, Asefa, Talley, Spiegel, van der Veen, & Gotway, 2001). To that end, in times of drought, farmers will frequently pull their young children out of school in order to assist them to increase and sustain their much needed crop production (Pain & Lautze, 2002). As a result, school attendance drastically decreases after grade one, which will increasingly contribute to adult illiteracy rates. According to HAPCO (2008), Ethiopia's adult literacy is low at only 40% and these rates are projected to decrease as truancy rises in Ethiopia. The demographic data illustrate the

interconnected pattern between Ethiopia's environmental insecurity and its influence on social indicators such as literacy and school attendance among children.

Health issues.

The Millennium Development Goals (MDGs) were created as social indicators and targets to eradicate extreme poverty among third world nations by the year 2015 (HAPCO, 2008). The government of Ethiopia committed itself to the MDGs in year 2000 and declared the issues of poverty, education, gender equity, child mortality rates and HIV/AIDS as crucial matters to be addressed urgently (UNAIDS, 2008). Since the adoption of the MDGs, Ethiopia has made great efforts to collaborate with international partners and incorporate a multi-level community approach in attaining the MDGs (HAPCO, 2008). Thus, Ethiopia created the Health Service Extension Program (HSEP) a culturally specific initiative in addressing the MDGs in Ethiopia. According to Mariam (2009), the HSEP focuses on involving the traditional self-governing bodies of Ethiopia known as the "Kebele". The HSEP translates the MDGs to the cultural context of Ethiopia by collaborating and integrating with the national health initiatives at the Kebele level (Mariam, 2009). Yet, despite these progressive steps, the MDGs are still in far reach in light of Ethiopia's current health disparities.

The Human Development Index (HDI) was created by the UNDP as a quantifiable measure that not only evaluates the GDP of a nation but it also measures the dimensions of human development (UNDP, 2009). According to the HDI, Ethiopia is ranked as one of the lowest, at 157 out of the 169 nations (UNDP, 2009). Major contributors to this low score include Ethiopia's current child and infant mortality rate.

According to Oxfam (2010), Ethiopia's infant mortality rate is one of the highest in the world at 80.8 per 1000 live births. In stark comparison, Canada's infant mortality rate is only 6 per 1000 live births (World Bank, 2010a). As discussed previously, the majority of Ethiopians reside in rural and isolated regions, which further compound the current accessibility and availability to antenatal care. Berhane et al. (2001) state the health program coverage as "...generally poor with an urban-biased distribution; overall only 45% of the population is served with formal health care. Services targeted to women have an even lower coverage; antenatal care coverage is about 25% and family planning coverage is only 6%" (p. 1526). Therefore, due to poor health coverage in rural regions, the majority of Ethiopia's population does not have access to much needed medical and antenatal care. Furthermore, UNICEF (2007) reports that one in six Ethiopian children will not survive past their fifth birthday. Sadly, many of these deaths are attributed to preventable and treatable diseases such as diarrhea and malaria (Oxfam, 2010). Due to Ethiopia's lack of potable and accessible water, children succumb to water borne diseases such as various parasitic and bacterial infections (World Health Organization [WHO], 2009). The impact of water borne diseases is further exacerbated by the presence of chronic malnutrition in Ethiopian children (Economic Intelligence Unit, 2008). Combined, these factors leave children more susceptible to the lethality of HIV.

HIV/AIDS in Ethiopia and Relevance

According to the WHO (2009) 60 to 80% of Ethiopia's morbidity and mortality are due to communicable and infectious diseases such as malaria, tuberculosis (TB) and HIV/AIDS. According to the Federal Ministry of Health (FMoH), the estimated adult

prevalence of HIV/AIDS in Ethiopia is approximately 2.2% (2006). Notably, HIV prevalence among Ethiopian women is higher at 2.6% in comparison to Ethiopian men at 1.8% (WHO, 2009). The highest HIV/AIDS rates are reported in urban dwelling centers. For example, in the capital of Addis Ababa the prevalence is estimated at 7.7% of the population, which largely represents younger adults (FMoH, 2006). Authors have suggested that youth residing in urban centers are more likely to be sexually active at an earlier age in comparison to their rural counterparts (Buseh, Glass, McElmurry, Mkhabela, & Sukati, 2001; Odujinrin & Akinduade, 1991). Researchers have noted higher sexual activity among urban youths due to an increase in multiple sexual partners (HAPCO, 2008). According to the FMoH (2006), Ethiopia's HIV infections are mainly transmitted by heterosexual contact, whereby the most vulnerable groups are young Ethiopians from the ages of 15-24 years. The government of Ethiopia declared HIV/AIDS detrimental to the future working force of the nation commenting that "...the loss of young adults in their productive years of life has affected the country's overall economic output. The HIV epidemic will continue to tax the limited health and social services delivery systems" (HAPCO, 2008, p.16). Thus, the already strained health systems within Ethiopia will continue to be depleted as HIV/AIDS infections continue to target Ethiopia's young working force. However, despite the detrimental effects of HIV/AIDS in Ethiopia, the government has made great strides to address the MDGs in scaling up national HIV preventative services. Specifically, since the nationwide awareness programs, HIV testing increased from 367, 006 in 2005 to almost 2.3 million in 2007 (HAPCO, 2008). In 2005 the Ethiopian government started the national free

Anti-Retroviral Therapy (ART) program for all People Living with HIV (PLWHA). Yet, great progress still remains in providing available HIV preventative services within Ethiopia. Unfortunately, 70% of PLWHA are still in need of ART, whereby only 6% of HIV positive mothers have received ART to prevent mother-to-child-transmission (FMoH, 2006). Thus, as preventative services remain scarce among PLWHA, it is estimated that the number of Ethiopian children orphaned by HIV/AIDS will double to 2.5 million by the year 2015 (UNICEF, 2006).

Conclusion

These alarming statistics demonstrate the need for further research among the target population of young Ethiopians. The historical and cultural context of the country underlines the complex health and social issues, which further propagates HIV/AIDS in Ethiopia. Although, Ethiopia has accomplished great strides in the treatment of HIV/AIDS, further interventions are needed in the prevention of HIV transmission among young Ethiopians. Therefore, the following chapter will provide a literature review on the specific risk factors young Ethiopians face vis-à-vis their potential knowledge gaps and misconceptions regarding HIV/AIDS transmission.

Chapter 2: Literature Review

This chapter will integrate current literature on the macro/micro-environmental issues within Ethiopia and its relationship to HIV/AIDS. The selected studies will highlight the current knowledge gaps and misconceptions of HIV/AIDS and the increased susceptibility among the target group of post-secondary students.

Two theoretical frameworks have been chosen to further guide the analysis and results of the study. The Social Theory of Gender and Power (Connell, 1987) will be used to demonstrate the gender role differences among female and male Ethiopian students. This theory will be used to highlight the possible gender differences in HIV knowledge and attitude scores among male and female students. The Knowledge Transfer Model by Lavis, Lomas, Hamid and Sewankambo (2006) will be used as a framework to further guide the need for HIV/AIDS awareness programs among Ethiopian students.

Knowledge and Attitudes of HIV/AIDS among Ethiopian Students

According to Andargie, Kassu, Morges, Kebede, Gedefaw, Wale, et al. (2009) Ethiopian young adults from the ages of 15-24 account for more than half of all new HIV infections. Recent literature has highlighted sexual risk behaviors such as early onset of sexual debut, multiple sexual partners and unprotected intercourse to be linked to the increased rates of HIV/AIDS among young Africans (Buseh et al., 2001; Negash, Gebre, Benti & Bejiga, 2003). A study conducted in Eastern Africa reported younger adults were 60% less likely to use a condom in comparison to their older counterparts (Hladik, Shabbir, Jelaludin, Woldu, Tsehaynesh, & Tadesse, 2006). The correlation between

high-risk behavior and HIV/AIDS knowledge are strongly related in the literature (De Visser & Smith, 2001; Taffa, Klepp, Sundby, & Bjune, 2002; Ukwuani, Tsui & Suchindran, 2003). For example, a comparative analysis study demonstrated that education initiatives such as school awareness programs on HIV transmission improved condom use among high school students (Ukwuani, Tsui, & Suchindran, 2003). Yet, despite such educational initiatives, young Africans continue to represent more than half of all new HIV infections and still lack factual HIV transmission knowledge (UNAIDS, 2008). Several descriptive studies have highlighted the increased rates of risky behaviors among this target population, which further compounds their exposure to HIV/AIDS. Notably, various researchers also illustrate the lower knowledge rates among young Africans and the need for further awareness programs (Buseh et al., 2001; Negash, et al., 2003). Recent studies among Ethiopian high school and university students highlight decreased usage of condoms and the lack of HIV transmission knowledge (Alene, Wheeler, & Grosskurth, 2004; Yerdaw, Nedi, & Enquoselassie, 2002). According to Fitaw and Worku (2002), only 37% of sexually active university students reported ever using a condom and only 6% of students reported consistent condom use. Furthermore, a cross-sectional study among high school students revealed that only 41% of female students and 44% of male students were educated on the various modes of HIV transmission (Alene et al., 2004). Correspondingly, the national survey of Ethiopia reported a similar trend, whereby 28.7% of young men and only 15.8% of young women were knowledgeable on the varied modes of horizontal HIV transmission (HAPCO, 2008). Several factors such as lower literacy rates, contextual gender roles, and lower

school enrollment have been linked to the lower HIV/AIDS knowledge among young women in relation to young Ethiopian men (UNICEF 2006; Ukwunai et al., 2003). Select qualitative studies have explored the context of HIV/AIDS knowledge among university students. Yet, few studies have addressed the reported gender differences in HIV knowledge levels among this target population (Ragnarsson, Onya & Aarø, 2009; Terry, Masvaure, & Gavin, 2005). One qualitative study in particular explored the knowledge of HIV/AIDS transmission among college students in Tanzania (Maswanya, Brown & Merriman, 2009). The thematic analysis revealed students' misinformation regarding HIV transmission, whereby several students believed HIV transmission is passed through water and saliva. Students also perceived themselves as less susceptible to contracting the virus. However, despite these important findings there is still a dearth of high quality studies that explore the specific barriers and facilitators of HIV transmission among male and female post-secondary students (Alene et al., 2004; Yerdaw, et al., 2002). Specific insights into these barriers and facilitators would yield important cues and future direction on how to implement gender specific HIV/AIDS awareness programs within Ethiopian schools.

Cultural Gender Identity and HIV/AIDS

Within Ethiopia there are clearly defined gender roles, which socially separate men and women in the division of labor and society. For example, in the rural regions of Ethiopia, men are typically responsible for raising livestock and trading agriculture commodities, while women stay local and tend to the domestic duties (Berhane et al., 2001). As such, it is customary for men to assume leadership roles socially and

commercially, while women assume more subservient domestic duties and often play a minimal role in major decision-making (Hadley, Lindstrom, Tessema, & Belachew, 2007). According to a mixed-method study conducted in rural Ethiopia these authors found “...over 70% of the married women have no right to sell farm products (crops) for their cash needs under any condition” (Berhane et al., 2001, p. 1534). Colclough, Rose and Tembon (2000), also state distinct gender roles even among Ethiopian children. For example, it was found to be more important to favor sending young boys to school, as they are perceived to be more economically valuable to the family’s income. A cross-sectional survey conducted in the Oromo region of Ethiopia reported that in times of drought young girls were more often taken out of school to fetch water to sustain crops and livestock whereas young boys remained at school (Oxfam, 2010). Similarly, Hadley et al. (2007) reinforce this statement by demonstrating an increased enrolment rate among male students opposed to females. Over time, these trends have resulted in a 50% literacy rate among male Ethiopians in comparison to only a 26% literacy rate among females (WHO, 2009).

For a number of reasons HIV/AIDS rates are disproportionately higher among female Ethiopians in comparison to their male counterparts (WHO, 2009). Researchers have reported societal norms as factors contributing to HIV/AIDS transmission among Ethiopian women. According to Berhane et al. (2001) young girls in Ethiopia are more susceptible to HIV/AIDS than boys due in part to early onset of sexual debut, early marriage customs and sexual abuse. A cross-sectional survey reported older men marrying young girls in efforts to secure a virgin bride (Molla, Berhane, & Lindtjorn,

2008). For example, Colclough, et al. (2000) have stated that regions in Ethiopia view “...pregnancy of unmarried daughters as culturally shameful. To avoid embarrassment, parents, in some rural areas give their daughters in marriage as soon as they reach the age of puberty and sometimes earlier” (p.21). According to USAID (2008), 23% of girls married in the Oromiya region are below the age of 15. In addition, men were twice as likely to have multiple sexual encounters in comparison to their female counterparts (Molla, et al., 2008). Kloos and Mariam (2000) report that the earlier commencement of sexual debut among young girls is a contributing factor to the higher AIDS rate among women between ages of 15-24.

Theory Exploration

As previously demonstrated, there is a strong connection between cultural gender roles between Ethiopian men and women and the relative incidence of HIV. With regard to the status of theoretical models, many researchers have criticized the dearth of theories that include the roles of culture and context and their impact on HIV/AIDS incidence (Dworkin & Ehrhardt, 2007; Pulerwitz, Gortmaker, & DeJong, 2000; Wingood & DiClemente, 2000). According to several researchers, behavioral change models utilized in HIV/AIDS research focus upon the individualistic changes in behavior modification yet fails to incorporate the gendered nature and societal nuances within a particular environment (Airhihenbuwa, 2000; Amaro, 1995; Munro, Lewin, Swart, & Volmink, 2007). For example, the Health Belief Model (Becker, 1974) and Theory of Reasoned Action and Planned Behavior (Ajzen & Fishbein, 1977) highlight the linear decision-making of behavior; however, omit the impact of one’s culture and environment on the

selected behavior. Furthermore, both theories stress the importance of individualistic change in the western arena, yet they neglect to mention the role of collectivist societies within an African setting. Although these models have been very beneficial in further understanding psychosocial behavior, further theoretical discussion is needed regarding gendered roles within the Ethiopian HIV/AIDS context.

In congruence with the HIV Determinant Framework (Barnett, et al., 2000), the societal context of HIV/AIDS plays a salient role in the mitigation or spread of this destructive disease. Therefore, a social theory on gender will be utilized to further understand the interaction between male and female Ethiopians' and their knowledge and attitudes towards HIV/AIDS. The Social Theory of Gender and Power (Connell, 1987), has been widely utilized in the literature to further understand the gender differences especially in the area of sexual behavior and HIV risk transmission (Dworkin, & Ehrhardt, 2007; Kershaw, Small, Joseph, Theodore, Bateau, & Frederic, 2006; Woolf & Maisto, 2008). Furthermore, Pulerwitz, et al. (2000), have translated the dimensions of Connell's theory into the validated Sexual Relationship Power Scale (SRPS). The SRPS has been used within varied HIV/AIDS contexts, from at risk mothers in South Africa to the frequency of condom use among urban youth (Dunkle, Jewkes, Brown, Gray, McIntyre, & Harlow, 2004; Teitelman, 2008). However, despite the theory's extensive applicability, further research is needed within the Ethiopian context. Therefore, the Social Theory of Gender and Power (Connell, 1987) has been chosen to further explain the interconnected dimensions of HIV/AIDS among young Ethiopians.

The social theory of gender and power.

According to Connell (1987) the main assumptions of this theory considers gender to be socially constructed. As an integrative theory, it takes into account the social context of gender roles (Wingood & DiClemente, 2000). The theory is comprised of three interrelated dimensions such as labor, power and cathexis; all three interact together to further elucidate gender relations in any institutional or societal context (Maharaj, 1995). According to Wingood and DiClemente (2000) the three theoretical dimensions are seen as both overlapping and independent from each other. The theoretical dimension of labor considers the dichotomous relationship between employment practices of men and women within particular societies. The second dimension of power illustrates the gendered differences regarding authority and control, which can arise at a societal and institutional level. Lastly, the dimension of cathexis explains the affective and sexual relationship between men and women and the social norms that surround them (Connell, 1987). Furthermore, Wingood and DiClemente (2000) state cathexis as our social expectation towards men and women, which ultimately "...shapes our perceptions of ourselves and others and limits our experiences of reality." (p. 544).

Therefore, the Social Theory of Gender and Power help us understand the relationships of labor, power and cathexis and their influences on gender. This theory highlights the societal expectations of males and females and can be useful in accounting for the differences in knowledge and attitudes on a variety of social issues including HIV/AIDS. Thus, the theory will be utilized to further explain the contextual differences between male and female knowledge and attitude scores regarding HIV/AIDS.

Knowledge Transfer and HIV/AIDS

The current trend in HIV/AIDS knowledge and attitudes clearly demonstrates the need for further awareness strategies among Ethiopian students. The WHO (2004) report on Knowledge for Better Health, forewarns of the challenges of the 2015 MDGs deadline due to current knowledge translation (KT) barriers and weak health systems in low-income countries. Moreover, the national HSEP based on the MDGs, states the urgency in integrating a multi-level approach, which addresses the knowledge gaps and misconceptions towards HIV/AIDS (FMoH, 2006). Furthermore, the FMoH stresses the importance of addressing these strategies among the target population of young Ethiopians (2006). Therefore, as current knowledge gaps persist in the literature, a KT framework has been chosen to highlight the knowledge and attitude levels among post-secondary students, as well as strategies to address these gaps.

Rationale for knowledge transfer framework.

In the field of KT research an over and abundant presence of various frameworks and models. Yet, only a few have been utilized in the context of low and middle-income countries (LMICs) (Pablos-Mendez & Shademani, 2006). For example, the Ottawa Model of Research Use (OMRU) developed by Logan and Graham (2004) asserts the importance of first assessing particular knowledge uptake barriers before implementing such KT strategies (see Appendix C). OMRU does provide a useful framework in assessing potential climates for KT interventions however; there is little attention paid to the salient role of the research-user in implementing KT strategies (Santesso & Tugwell, 2006). In comparison, Lavis, Lomas, Hamid, and Sewankambo (2006) developed a

model for Assessing Country-Level Efforts to Link Research to Action (ACLELRA) as a knowledge transfer framework (see Appendix D). However, this framework defers as it outlines the varied roles of the research-user, in order to maximize effective collaboration between researcher and research-user (Lavis et al., 2006). For example, the WHO recently utilized the ACLELRA framework in order to assess the rationale of political key informants in 5 low middle-income countries LMICs (Cordero, Delino, Jeyaseelan, Lansang, Lozano, Kumar et al., 2008). It was found to be a useful strategy to organize and assess the varied KT strategies implemented by the key informants (Cordero et al., 2008).

As an overview, the ACELERA framework consists of four different models, which integrate various levels of knowledge translation (International Development Research Canada [IDRC] & Swiss Development Cooperation [SDC], 2008). The first model consists of the *Push Model*, which designates the researcher as the main agent for change. Therefore, the decision-makers are usually on the receiving end of various knowledge integrative strategies, while the researchers are more involved in presenting the strategies to potential research users (IDRC & SDC, 2008). The second model consists of the *User-Pull*, which designates the research user as the agent "...reaching in to the research world to extract information for a decision that they face." (Lavis et al., 2006, p. 622). The *User-Pull* Model highlights the research user as the main agent, while the researcher facilitates this process by improving access to the research. The *Exchange Model* consists of a dual partnership between the research conductor and the researcher user, whereby both parties are involved in creating various knowledge systems projects

(Lavis et al., 2006). Lastly, the *Integrative Model* combines all aspects of the *Push*, *Pull* and *Exchange Models* as a multi-level knowledge translation platform (IDRC & SDC, 2008). This model focuses on a regionally or institutionally committed method by integrating research strategies at a multi-sector approach.

Therefore, the *Integrative Model* by Lavis et al. (2006) has been chosen as a guide to address the current knowledge gaps and attitudes of HIV/AIDS among young Ethiopian students. The *Integrative Model* shows similarities to the Regional East African Community Health (REACH) policy initiative, which focuses on creating a governing platform that comprises of both researcher and research-users within the African context (van Kammen, de Savigny & Sewankambo, 2006). For example, the REACH policy initiative successfully implemented effective policy change in ART therapies by incorporating an integrative KT approach as described by Lavis et al. (as cited in van Kammen et al., 2006). This model also corresponds with Ethiopia's current national MDGs, which emphasize the implementation of multi-level HIV/AIDS awareness strategies (FMOH, 2006; HAPCO, 2008). Thus, by applying an Integrative approach at all levels, such as students, professors and educational institutions can be involved in the decision-making process.

Conclusion

This chapter highlighted the current literature regarding Ethiopia's context and its relationship towards HIV/AIDS. The HIV Determinant Framework (Barnett, Whiteside & Decosas, 2000) guided the literature review to integrate the current societal context of Ethiopia and its role in HIV/AIDS transmission. Selected research studies demonstrated

the gender differences in knowledge and attitude scores among young male and female students and the increased need for awareness programs. The Social Theory of Gender and Power (Connell, 1987) and the ACLELRA (Lavis et al., 2006) were outlined as two frameworks to further guide the analysis and results regarding the students' knowledge and attitude scores. The following chapter will discuss the specific rationale for population choice and the specific study methods.

Chapter 3: Methods

This chapter will outline the methodological processes used to conduct the research. It will address processes used to recruit participants and collect data on the knowledge and attitudes of HIV/AIDS among post-secondary students in a southern Ethiopian city. The AIDS Attitude Scale (Froman, Owen, & Daisy, 1992) and the HIV Knowledge Questionnaire (Carey & Schroder, 2002) were chosen as two standardized questionnaires to measure the knowledge and attitudes of HIV/AIDS among the recruited participants. This chapter will summarize the specific strategies utilized to collect, analyze and store the study data. The specific steps involved in obtaining ethical approval in both Canada and Ethiopia will be outlined.

Methods

Purpose and rationale.

The Ethiopian government recently stated the urgency in addressing HIV/AIDS as it targets Ethiopia's young working force (HAPCO, 2008). As outlined in the literature review, urban youths are increasingly susceptible to HIV transmission due to earlier sexual onset, an increase in multiple sexual partners and decreased condom use (Buseh et al., 2001; HAPCO, 2008; Odujinrin & Akinduade, 1991). Furthermore, the literature denotes the current misconceptions and knowledge deficits regarding HIV transmission among the specific target group of Ethiopian post-secondary students (Alene et al., 2004; Fitaw & Worku, 2002; Yerdaw et al., 2002). Notably, recent statistics demonstrate the varying levels of knowledge about HIV transmission among male and female youth (HAPCO 2008; WHO, 2009). Researchers have attributed these differing knowledge

levels to delineated gender roles between men and women in the societal roles of labor, power and relationships (Berhane et al., 2001; Hadley et al., 2007; Ukwunai et al., 2003). Thus, the literature review demonstrates the need to further investigate the knowledge and attitude levels of HIV/AIDS among the vulnerable group of Ethiopian students.

The purpose of this thesis is to measure the levels of knowledge about and attitudes towards HIV transmission among post-secondary students. Thereafter, the engendered knowledge about and attitudes towards HIV/AIDS among the male and female students will be compared and contrasted.

Research Questions

The primary goal of this study is to identify the levels of knowledge about and attitudes towards HIV/AIDS between young male and female Ethiopian students. The intent is to determine whether or not male and female students differ in their knowledge and attitudes as measured by a knowledge questionnaire and an attitude scale. This research goal is drawn from the literature, which suggests male and female Ethiopians have different attitudes and knowledge towards HIV/AIDS (De Visser & Smith, 2001; Taffa, et al., 2002). Below is a list of alternative hypotheses that will direct the collection and analysis of data.

Hypotheses.

Ho1: There is a significant difference between the mean scores for HIV knowledge and attitudes between the male and female students.

Ho2: There is a significant association between the knowledge scores and attitude scores.

Ho3: There is a significant relationship between the HIV knowledge scores and the empathy and AIDS avoidant attitude scores for males and females.

Gaining Entry

According to the cultural and tacit context of Ethiopian culture, it is necessary to recruit key informants as gatekeepers to the research field (Broadhead, Heckathorn, Weakliem, Anthony, Madray, Mills, et al., 1998). Furthermore, Molyneux and Geissler (2008) state the relevance of first collaborating with actors at the local level before commencing research in a foreign setting. A UNAIDS (2006) report on “Creating Effective Partnerships” summarized the increased sustainability of projects which collaborated with partners at the local level. Therefore, with the help of a Canadian/Ethiopian public health nurse, contact with a former faculty member at a university in southern Ethiopia was initiated. After this initial dialogue, the former faculty member acted as a key informant in obtaining access at the university and at the college. The key informant coordinated essential liaisons within both institutions. Furthermore, the key informant helped facilitate obtaining ethics approval from both the university and college’s research ethics board (REB).

Ethical Considerations

Ethics approval was firstly obtained from McMaster University’s REB. Ethics approval was subsequently obtained from both the university and college’s REB. Consent forms were provided to all participants outlying the complete anonymity of the questionnaires and the right of every participant to withdraw at anytime while completing the questionnaires. All information was anonymized. No names or identifiers were on

the questionnaires. All data are safely stored in a password-protected computer. The study questionnaires are kept in a locked cabinet. Upon successful defense, the questionnaires will be shredded.

Research Design

A cross-sectional survey design was used in order to measure the level of knowledge about and attitudes towards HIV transmission among male and female post-secondary students. According to Levin (2006), a cross-sectional study enables the researcher to measure a phenomenon at one point in time and best measures its prevalence in a specific population. Thus, utilizing a descriptive design facilitated capturing the level of knowledge and attitudes of HIV/AIDS among the target population. The survey was conducted in a separate one-day period for each of the institutions.

Setting

The cross-sectional study took place in a major urban city in the south of Ethiopia. According to the Government of Ethiopia, the population of this city is estimated at 260,000 (Central Statistical Agency, 2007). The university was founded in 1999 and is renowned as one of the top Ethiopian universities specializing in agronomy programming (T. Tesfaye, personal communication, May 7th, 2010). The college was one of the first technical colleges in southern Ethiopia (S. Kamundu, personal communication, May 13th, 2010). This college certifies various medical trades such as pharmacy assistants, laboratory technicians, practical nurses and medical secretaries.

Participants

The recruited participants were male and female students enrolled at the post-secondary institutions. The students at the college and university were similar in age, culture and geographic background. All participants provided a written and informed consent. All participants were between the ages of 18 and 30 years and spoke Amharic and English. Both post-secondary institutions require a minimum admission age of 18 years or older. The rationale in choosing participants 18 years of age and older is due to the sexual content of the questionnaires.

Sampling

The sampling method was based on non-probabilistic sampling (Levin, 2006). The department heads at the university and the college were approached, in order to ascertain the most appropriate means and timeframe for the study.

At the college, the clinical instructor provided information on potential room allocations and feasible timeframes to conduct the survey among the college students. The instructor notified all students regarding the date and time of the study. As per the college instructor's suggestion the study took place on the suggested date of May 12th, 2010.

At the university, the academic coordinator provided room locations and a feasible timeframe to conduct the survey. The coordinator also facilitated the involvement of two university students (1 male and 1 female) to act as outreach volunteers in recruiting potential participants for the study. The two outreach volunteers shared with fellow students the opportunity to take part in this study and to receive

remuneration for their time. As per the suggestion of the coordinator, the study survey took place on the suggested date of May 15th, 2010.

Utilizing StatCalc (AcaStat Software, version 7.0), a calculated sample size of 88 males and 88 females in both institutions was required for sufficient power (80% power at the 5% level of significance). An extra 15% (12 males and 12 females) were sampled in order to account for possible incomplete or non-returned questionnaires (Hulley, Cummings, Browner, Grady, & Newman, 2001). Therefore, the target sample is 200 participants (100 males and 100 females) in total. The total sample is 101 male students and 126 female students.

Data Collection Process

Visser (2008) outlines the possible power barriers that may exist when professionals in authority recruit students as participants. Therefore, in order to mitigate or diffuse potential power imbalances between students and professors, the study procedures and questionnaires were described after the professors left the assigned classrooms. This procedure facilitated students to leave the classroom at any point in time without the presence of school authority figures (Visser, 2008). Due to the sexual content and sensitive nature of HIV/AIDS, two separate classrooms were provided for the male and female students to fill out the questionnaires. The researcher (master's student) was introduced and the purpose of the study was described in English. The key informant then translated into Amharic in order to ensure comprehension among the students. All willing participants who stayed in the classroom were given a study packet, which included specific questionnaire guidelines, informed consent, demographic

questionnaire, HIV knowledge questionnaire and the AIDS attitude questionnaire. The right to refuse involvement and/or leave at any time during the survey was re-iterated. The right to confidentiality was also addressed. Once questionnaires were completed and submitted, participants were given a gift of appreciation for their time.

Data Collection Instruments

The study packet included a demographic data questionnaire, the HIV knowledge questionnaire (HIV-KQ-18) and the AIDS attitude scale (AAS). The demographic questionnaire included data on age, sex, language, ethnicity, religion, education, and relationship status (see Appendix E). All three questionnaires were translated from English to Amharic, Ethiopia's official language. The questionnaires were translated back to English in order to ensure consistency from the original English version of the questionnaire (Sobel & Kugler 2007). In order to ensure face validity, the study questionnaires were administered to one male volunteer and one female volunteer (Haynes, Richard & Kubany, 1995). All parties agreed on the scales' appropriate comprehension and proper use of the Amharic language.

HIV/AIDS knowledge questionnaire.

The HIV knowledge questionnaire (HIV-KQ-18) formulated by Carey and Schroder (2002) was utilized to measure knowledge of HIV transmission (see Appendix F). It is an 18 item, self-administered questionnaire, which tests the general knowledge of transmission, prevention and treatment of HIV/AIDS. The HIV-KQ-18 consists of 18 "true", "false", or "don't know" statements, which are tallied up as a crude score on the overall correct answers identified. The minimum and maximum value range from 0-18.

Thus, a higher score suggests greater knowledge and conversely a lower score on the HIV-KQ-18 would indicate a lower general knowledge of HIV/AIDS (Carey & Schroder, 2002). The HIV-KQ-18 is internally consistent ($\alpha=0.91$) and achieved satisfactory test-retest reliability among a pilot control group after one week ($r=0.83$) (Carey & Schroder, 2002).

HIV/AIDS attitude scale.

The AIDS Attitude Scale (AAS) by Froman, Owen, and Daisy (1992) was first formulated to ascertain the attitudes of health professionals towards HIV/AIDS (see Appendix G). Since then, the AAS has been applied in sub-Saharan countries and with differing populations (Froman & Owen, 1997). The AAS was found to be internally consistent ($\alpha=0.76$) and possessing predictive and construct validity (Froman & Owen, 1997). AAS is a 21 item scale which measures two subscales of empathy and avoidance regarding HIV/AIDS. The scale is based on a six point Likert scale varying from one (strongly disagree) to six (strongly agree). Each item is scored from one to six.

According to Froman and Owen (1997), the questionnaire is composed of two correlated subscales: 14 empathetic items and 7 avoidant items. The empathetic items are described as questions, which denote a therapeutic and positive viewpoint towards HIV/AIDS, while avoidant subscales are described as stigmatic and negative (Froman et al., 1992). According to Froman et al. (1992) the items 1-5, 8-11, 14, 15 and 19-21 are coded as avoidant and items 6, 7, 12, 13, 16-18 are coded as empathetic items. A higher score on the empathetic subscale indicates a more acceptant attitude towards HIV/AIDS, while a higher score on the avoidant subscale denotes a more intolerant attitude towards people

living with HIV/AIDS. In order to calculate the total scores of AAS, the empathy items are subtracted from the avoidant subscales. A general attitude score can range from – 5 to +5 (Froman & Owen, 1997). A high score on AAS suggests an attitude of acceptance towards HIV/AIDS, while a lower score on the AAS suggests an avoidant or intolerant attitude towards HIV/AIDS.

Methods of Analysis

The initial data was entered into an Excel spreadsheet. Once verified for accuracy, the researcher then transferred the data into Statistical Package for the Social Sciences (SPSS). Descriptive statistics will be reported for the demographic data. For the purpose of analysis, all categorical variables (language, religion, relationship and ethnicity) less than 20 items will be collapsed and labeled as other groups. Depending on the measurement scale of the variables, the mean, standard deviation, frequencies and valid percentages will be reported for each gender in a result table. A t-test was chosen in order to compare two means of continuous or ordinal data between two independent groups (Carlin & Doyle, 2001). Based on the first hypothesis, an independent t-test was applied in order to decipher whether or not male and females are different in mean scores for the HIV-KQ-18 and AAS scales. For the second hypothesis, a Pearson's correlation coefficient was utilized to examine the association between HIV-KQ-18 and AAS scores among male and females. Lastly based on the third hypothesis, a multiple linear regression was conducted in order to measure the relationship strength between the independent variable (HIV knowledge levels) and the empathy avoidance scale, while adjusting for the demographic variables. The demographic variables included age, sex,

language, ethnicity, relationship and religion. The significance level of the test results was set at the 0.05 level. Data were analyzed using SPSS version 17 statistical software.

Conclusion

In summary, this chapter outlined the specific methods utilized to conduct a cross-sectional study among male and female students in a southern Ethiopian city. Two standardized scales were applied in order to measure the level HIV transmission knowledge and attitudes among the target population. Demographic data was also collected to illustrate the contextual variances among male and female students. The demographic data and attitude scores were coded as predicting variables for the outcome variable of HIV knowledge scores among males and female participants. The following chapter will outline the study results from the specific statistical tests conducted.

Chapter 4: Results

This chapter will outline the various statistical processes and results. The first section of this chapter will discuss the descriptive results utilizing frequencies, percentages, means and standard deviations (SD) from the demographic data collected. The following sections will answer the specific hypotheses outlined in Chapter 3. Varying statistical tests such as an independent t-test, a correlation test and a regression analysis was conducted. The significance of these results was further corroborated with relevant literature in the following discussion chapter.

Demographic Results

The total sample size collected was 227 participants, 101 males and 126 females. The age of participants ranged from 18-30 years, with a mean age of 20.2 (SD=2.3). The mean age among females was 20.0 (SD=2.2), while male participants were slightly older with a mean age of 20.4 (SD=2.3). As illustrated in Table 1, 78.2% of the male participants were between the ages of 18-21 and 84.9% of female students were between the ages 18-21. The majority of participants were of Amharic descent (males 27% and females 50.5%). The second most prevalent ethnic group was Oromo (males 19.1% and females 12.8%). All participants stated Amharic as their first language of choice. Similarly, both male and female participants stated Oromo as their second language (males 32.1% and females 21.6%). The third language most frequently spoken by students was English (males 15.0% and females 10.0%). Male students reported a higher frequency of speaking English in comparison to female students (37.6% and 23.0%). Similarly, more male students stated speaking two or more languages (55.4%) in

comparison to females (29.4%). The religion most reported by all participants was the Orthodox faith (male 42.9% and females 61.5%). The second most reported religion was Protestant (male 38.8% and females 30.8%). All other religions and credence were rated much lower in comparison to the Orthodox and Protestant faiths (see Table 1).

The majority of female students reported not being sexually active (78.3%), in comparison to 48.8% of males. In contrast, 51.2% of male students reported yes to being sexually active, whereas only 21.7% of females stated they were sexually active. A large percentage of both male and female students reported their relationship status as single (males 82.2%, females 60.3%). Only 13.9% of male students stated they were in a relationship, whereas 31.0% of female students stated they were in a dating relationship. A small group of female students reported they were married (7.1%), in comparison to 0.0% of male students (see Table 1).

HIV-KQ-18 Results

The HIV-KQ-18 scale by Carey and Schroder (2002) was utilized to assess HIV transmission knowledge among male and female students. The HIV-KQ-18 consists of 18 true or false questions. Each correct item obtains a score of 1, while incorrect or do not know responses were coded as 0. The male students completed a total of 101 questionnaires and the female students completed a total of 126 questionnaires. All knowledge questionnaires were completed without missing data. The female students' total minimum and maximum scores ranged from seven to 17 (see Figure 1). Similarly, male students' minimum and maximum knowledge scores ranged from six to 17. See

Table 2 for further illustration on the median HIV-KQ-18 scores among male and female students.

Upon further analysis, question five (Q5), “Showering, or washing one’s genitals/private parts, after sex keeps a person from getting HIV”, had the highest percentage of correct answers among male students (91.1%). Similarly, males scored high (90.1%) for both Q2, “A person can get HIV by sharing a glass of water with someone who has HIV” and Q8, “There is a vaccine that can stop adults from getting HIV”.

Female students’ scores were comparable to that of male students. Female students’ high mean score was also achieved on Q5 (92.1%) and Q8 (90.5%). However in contrast to the male students, females achieved the second highest (91.3%) on Q14, “Having sex with more than one partner can increase a person’s chance of being infected with HIV”. Females scored higher on Q1, “Coughing and sneezing do not spread HIV” (90.5%) in comparison to male students (81.2%).

The male students scored the lowest (13.9%) on Q4 “A women can get HIV if she has anal sex with a man.” Likewise, the male students scored lower (27.7%) on Q12 “A natural skin condom works better against HIV than does a latex condom” and on Q9 (39.6%), “People are likely to get HIV by deep kissing putting their tongue in their partner’s mouth, if their partner has HIV”.

Similarly, females scored the lowest on Q4. However, their mean score was considerably lower than that of their male counterparts (5.6%). Females also scored lower on Q12 in comparison to male students (27.0%). The third lowest score among

females was on Q18 “Using Vaseline or baby oil with condoms lowers the chance of getting HIV” (37.3%). Females also scored comparably low on Q9 (41.3%).

Both male and female groups scored lower on sexual transmission knowledge of HIV. As noted above both groups scored low on Q1, Q3 and Q4. Notably, both groups scored lower on Q17 “a person can get HIV from oral sex”. Only 41.6% of males and 40.5% of females answered correctly on Q17 (see Table 2).

AAS Results

The total number of participants that filled out the AAS was 227 (126 females and 101 males). There were no missing data from the analysis. The following AAS results are further illustrated in Table 3. The mean total AAS scores among male students was 1.6 (SD= 1.1). Female students scored slightly lower with a mean score of 1.5 (SD=1.3) on the AAS (See Table 3). However, there was no significant difference among male and female mean scores ($p=0.1$). The empathy subscale revealed a comparable mean among both male and female students (mean=4.8, SD=1.1, $p=0.7$).

The majority of male and female students identified an empathetic attitude towards those living with HIV/AIDS (Q6, Q7, Q12, Q13, Q16-18). For example, both male (mean=5.3, SD=1.3) and females (mean=5.3, SD=1.4) strongly agreed with Q6, “I think patients with AIDS have the right to the same quality of care as any other patient”. Male (mean=5.0, SD=1.5) and female (mean=5.0, SD=1.6) students also scored comparably on Q7, “It is especially important for hospital patients with AIDS to be treated in a caring manner”. Likewise, male and female students strongly identified with Q17, “I would like to do something to make life easier for people living with AIDS”. For example, male

students achieved a mean score of 5.1 (SD=1.3) and female students achieved a mean score of 5.5 (SD=5.7).

The avoidant subscale (Q1-5, Q8-11, Q14, Q15, Q19-21), although non-significant ($p=0.3$), demonstrated a lower mean score among the male students (mean=3.2, SD=0.8) in comparison to the female students (mean=3.4, SD=0.7). The box-plot diagram illustrates a lower median score among the male group. However, the male group scores demonstrated more outliers in comparison to the female group (see Figure 2).

Male students demonstrated a lower mean score (mean=2.1, SD=2.3) in comparison to the female students (mean=2.3, SD=1.6) on Q4 “If I had to have contact with someone with AIDS, I would worry about putting my family and friends at risk of contracting the disease”. Similarly, male students scored lower (mean= 2.7, SD=1.6) on Q8 “I think people who are IV drug users deserve to get AIDS”, in comparison to females students (mean=3.1, SD=1.6). Both male and female students scored the lowest on Q5 “Young children should be removed from the home if one of the parents is HIV positive”. For example, male student reported a mean score of 1.9 (SD=1.5) and females reported a mean score of 1.8 (SD=1.5). Similarly, male and female students also identified lower with Q4 and Q15 (see Table 3).

The comparative analysis also illustrated that both male and female students identified strongly with selected avoidant items on the AAS. For example, male (mean=5.0, SD=1.6) and female (mean=5.3, SD=1.4) students scored the highest on Q10, “homosexuality should be illegal”. Likewise, male and female students scored high on

Q11 “Children or people who get AIDS from blood transfusions are more deserving of treatment than those who get it from IV drug abuse. However, females scored higher (mean=4.6, SD=1.7) on Q11 in comparison to male students (mean=4.0, SD=1.8). Similarly, female students scored higher on other avoidant items (Q1, Q2 and Q21) in comparison to their male counterparts (see Table 3).

Difference in HIV-KQ-18 Scores among Male and Female Students

An independent t-test was conducted in order to ascertain whether or not there was a significant difference in the mean HIV-KQ-18 and AAS scores between male and female students. The mean HIV-KQ-18 score among the male group was 12.4 (SD=2.3), while the female group mean score was slightly lower 12.3 (SD=2.5). The independent t-test revealed no significant difference in the mean scores of male and female students ($t=0.6$, $df=225$, $p=0.4$). Therefore, based on the t-test analysis we can conclude that H_0 cannot be accepted, as there is no significant difference between male and female students' HIV knowledge scores.

Difference in AAS Scores among Male and Female Students

The AAS total score demonstrated a mean of 1.61 (SD=1.1) among the males and a slightly lower mean score among the female group (mean=1.5, SD=1.3). The t-test analysis revealed no statistically significant difference in the mean AAS scores between the male and female students ($t=0.9$, $df=225$, $p=0.9$). Thus, based on the t-test analysis we can conclude that there is no significant difference between attitude scores among the male and female students.

The mean AAS avoidant scores demonstrated a higher mean score among the females (mean=3.4, SD=0.7) in contrast to the male group (mean=3.2, SD=0.8). The t-test analysis revealed no significant difference between the AAS avoidant attitudes among the male and female students ($t=-1.5$, $df=225$, $p=0.3$). Therefore, we can conclude there is no significant difference in the mean AAS avoidant scores between the male and female group.

Association between HIV-KQ-18 and AAS Scores

A correlation test was conducted in order to ascertain whether or not there is a significant association between the AAS attitude scores and the HIV-KQ-18 knowledge scores. The results of the Pearson's correlation analysis demonstrated a significant negative relationship between AAS avoidant scores and HIV knowledge scores ($r=-0.2$, $p<0.01$). Therefore, we can accept H_0 . The scatter dot diagram in Figure 3 also demonstrates a weak negative relationship between HIV scores (y axis) and AAS avoidant scores (x axis). The correlation result between HIV knowledge scores and AAS total scores illustrated a negatively weak significant relationship ($r=-0.19$, $p<0.05$). However, the correlation test between HIV scores and AAS empathy scores was non-significant ($r=0.05$, $p=0.4$). Similarly, a multiple regression analysis, using a backward approach, was conducted between HIV knowledge and the demographic variables (age, gender, language, ethnicity, relationship and religion). The results demonstrated a non-significant relationship among HIV knowledge levels and the demographic variables ($p=0.7$).

Relationship Strength between HIV-KQ-18 Scores and AAS Scores

Based on the correlation analysis, a linear regressions test was conducted in order to measure the relationship strength between HIV knowledge and AAS avoidant subscale. The linear regression analysis demonstrated a significant relationship between HIV knowledge scores and AAS avoidant scores ($p < 0.01$). Therefore, we can accept H_0 . Based on the regression analysis, the regression equation is $y = 14.765 - 0.741x$ (see Figure 3). The best-fit line illustrates a significant negative linear relationship. The scatter-dot diagram demonstrates for every one unit increase of AAS avoidance scores, HIV knowledge scores decrease by 0.7 units. Therefore, for every one-point increase in avoidant AAS scores, HIV knowledge levels decrease by almost one point.

Conclusion

In summary, the findings demonstrated salient cues on the level of HIV transmission knowledge among male and female students in southern Ethiopian city. The individualized HIV-KQ-18 item analysis yielded important data on the students' awareness of various modes of HIV transmission. Furthermore, the results also demonstrated a significant negative relationship between avoidant attitudes scores and HIV knowledge scores. In contrast to the literature review, the gender variable did not interact with the varying HIV knowledge levels between male and female students. Therefore, the following chapter will further outline the significance of the study results vis-à-vis the current literature and Ethiopian context.

Chapter 5: Discussion

This chapter will summarize the salient findings from the results chapter and triangulate similar concepts according to the initial literature review. An additional literature search was conducted in order to further understand the study results. The Social Theory of Power and Gender (Connell, 1987) will also be used as the theoretical framework to help guide the interpretation of the study results and corroborate findings with the current literature. The study limitations will be outlined in order to further elucidate possible methodological biases.

Student Demographics

The results from the analysis of demographic data revealed a gender dichotomy regarding English literacy among study participants. For example, the male students' responses indicated that they were almost twice as likely to utilize English as a working language in comparison to female students. These results are both aligned and contradicted by current literature. One body of literature suggests a relationship between a higher usage of information communication technologies (ICT) among male Ethiopians and proficiency in using the English language (Bahta & Utsumi; 2004; Cherinet & Mulugeta, 2002; Geldof, 2007). According to Cherinet and Mulugeta, ICT are described as media forums, which enable media dialogue and exposure at the national and international level. These forums include radio, television, Internet communication and cellular devices. Geldof explains the linear relationship between ICT and English literacy, as many ICT devices are conducted in the English alphabet and therefore require proficiency in the English language. Furthermore, the United Nation Population Fund

(UNFPA) reports an increased socio-economic status (increased income and education) as a positive predictor for ICT utilization (2008). These results support the initial literature review, which demonstrated higher rates of literacy, income and education among males (Berhane et al., 2001; Cherinet, & Mulugeta, 2002; Hadley et al., 2007; WHO, 2009).

A second body of literature found studies conducted within an urban setting revealed no significant difference between ICT usage and gender (Milek, Stork & Gillwald 2010). These results do not support the lack of English literacy in this study. Similarly, the Ethiopian demographic health survey (DHS) found comparable rates of income and professional employment between male and females residing in major urban cities (as cited in Dendir, 2006). These results differ from the current gender disparity among rural Ethiopian women, whereby females in urban settings reported higher usage of ICT in comparison to rural women (Cherinet & Mulugeta, 2002). Therefore, further research is needed regarding the correlation between ICT and gender within the specific demographic of Ethiopian students residing in urban centers.

The demographic data also demonstrated variance in the sexual status between male and female students. For instance, the majority of male students stated they were sexually active in comparison to females. Furthermore, a larger proportion of male students stated they were single in comparison to female students. In contrast, female students reported a higher incidence of being in a dating relationship compared to male students. These results corroborate with the current literature, which states gender differences in reported sexual behavior among post-secondary students residing in urban

settings (Adamu et al., 2003, Astatke, Black & Serpell, 2000; Molla et al., 2008; Mulatu, Adamu, & Haile, 2000; Wouhabe, 2007).

One study in particular reviewed the sexual practices among high school students across four urban centers in Ethiopia. The study revealed that male students report higher risky behaviors such as multiple sexual partners and lower age of sexual debut in comparison to female students (Mulatu et al., 2000). Correspondingly, a cross-sectional study conducted among high school students found similar results, whereby male students were more likely to report a higher incidence of sexual activity in comparison to female students (Astatke et al., 2000). The selected body of literature demonstrates a correlation between male students and risky sexual behavior in comparison to female students. These findings are supported by the results from the analysis of the demographic data, which also illustrated an increase in reported sexual activity among male students in comparison to female students.

Students' AAS Scores and Significance

The key findings of the AAS demonstrated an overall empathetic attitude between male and female students towards PLWHA. Students highly identified with the need to treat PLWHA with the same dignity as the general public. The high score of empathetic AAS items correlates with the current literature (Alemu, Abseno, Degu, Wondmikun, & Amsalu, 2004; Negash et al., 2003; Yerdaw et al., 2002). The cross-sectional study conducted by Yerdaw et al. compared and contrasted the AIDS attitudes between students, urban dwellers, farmers and sex workers in Ethiopia. Students were found to have the highest positive attitude towards HIV/AIDS in comparison to all other groups.

In this study only 29.4% of students stated they were fearful of PLWHA, while more than 70 % of farmers reported a strong aversion to PLWHA (Yerdaw et al., 2002).

Negash et al. found similar results, whereby 60% of the young population disagreed with the social isolation of PLWHA. These findings suggest a correlation with the current study results, which demonstrated an overall high empathetic attitude score among post-secondary students. These differences may be due to increased media exposure among students/young people in comparison to other demographic groups.

The AAS avoidant item scores revealed similar results for male and female students combined. Notably, the analysis of avoidant items demonstrated students' discordant attitudes towards homosexual populations and PLWHA. The majority of students felt that PLWHA deserved reproach. For example, students scored highest towards items that outlined the negative connotation of HIV/AIDS and the association with homosexual peoples. However, the participants only identified negative attitudes towards PLWHA if the transmission of the virus occurred from either drug abuse or sexual promiscuity. Therefore, students were more sympathetic to PLWHA who were infected through blood transfusions or vertical transmission such as the mother transmitting HIV in utero.

At a contextual level, Ethiopia's stance on homosexuality is considered punitive and punishable by law (Ephrem & White, 2011). Cultural and religious norms in Ethiopia associate homosexuality as a closed topic of reproach (Tadelea, 2010). Consequently, scant literature exists regarding homosexuality and HIV/AIDS in Ethiopia. However, despite the dearth of Ethiopian research, various African countries have

identified the risks associated with this specific population and HIV/AIDS (Carter, 2008; Johnson, 2007). Therefore, the literature denotes the social and religious norms implicated with negative attitudes towards homosexuality among the study participants. These cultural norms might help explain the results on the AAS avoidant item scores.

Students' HIV-KQ-18 Scores and Significance

Overall, the results from the HIV-KQ-18 questionnaire demonstrated a low average knowledge score for male and female students. Particularly, both male and female students answered considerably lower on items regarding the specific modes of HIV transmission. The majority of male and female students believed HIV is transmitted by deep kissing (Q9). Similarly, a large percentage of students also scored low on vertical transmission items. For instance, the majority of both male and female students agreed that HIV is not transmitted by oral or anal sex (Q4 and Q17). These study results correspond with the current literature, which demonstrates a gap in knowledge among Ethiopian youth regarding the varied modes of HIV transmission (Alemu et al., 2004; Cheri, Mitkie, Ismail, & Berhane, 2005; Yerdaw et al., 2002).

One cross-sectional study in particular reported similar results. Yerdaw et al. (2002) demonstrated low HIV transmission knowledge among high school students in Northeastern Ethiopia; 83% of high school students believed HIV is transmitted via a toothbrush and saliva. Similarly, Cheri et al. (2005) reported comparable results among high school students in Addis Ababa. Their results demonstrated low knowledge levels regarding the various modes of HIV transmission. As demonstrated by the selected literature, a clear knowledge gap exists between the modes of HIV transmission and

young Ethiopians. Although the selected research corroborates the current study results, the majority of the cited articles were based upon a high school student population, which would be of a younger age than the participants of this study. Therefore, further research is needed among the specific demographic of post-secondary students in Ethiopia.

Relationship between AAS Avoidant Scores and Lower HIV-KQ-18 Scores

The regression analysis demonstrated a significant relationship between HIV-KQ-18 scores and avoidant AAS scores. As predicted from the initial hypothesis, HIV knowledge levels decrease by almost one point for every one-point increase in avoidance AAS scores. That is, both male and female students who identified higher with negative AAS avoidant item scores achieved a lower score on HIV knowledge levels. The literature suggests similar findings, whereby increased negative attitudes and stigmatic viewpoints towards HIV/AIDS correlate with lower knowledge levels regarding the transmission and progression of the virus (Medel-Anonuevo, 2005; Rahlenbeck, 2004; Tavoosi, Zaferani, Enzevaei, Tajik & Ahmandinezhad, 2004; Walusimbi & Okonsky, 2004).

A study conducted in Uganda among university students found similar results regarding HIV/AIDS knowledge levels and attitude scores (Walusimbi & Okonsky, 2004). The authors found a significant negative linear relationship between fearful AIDS attitudes and lower HIV/Knowledge scores (Walusimbi & Okonsky, 2004).

Correspondingly, a cross-sectional study conducted in Rwanda revealed health practitioners who identified higher with positive attitudes also scored higher on the HIV knowledge questionnaire (Rahlenbeck, 2004). According to Medel-Anonuevo (2005),

HIV literacy programs on HIV transmission and knowledge were found to change negative attitudes among young Ethiopians. The current study did not find a significant relationship between empathetic attitudes; although the literature suggests correlating factors between changes in negative attitudes and increased HIV literacy.

Significance of HIV-KQ-18 Scores between Male and Female Students

The results of the independent t-test demonstrated no significant difference in HIV knowledge scores between male and female students. However, these results contradict the initial literature review and hypothesis generated. The majority of the research demonstrated a gender dichotomy in the HIV knowledge levels among young Ethiopians. However, when examined more closely, the literature review focused on the rural context of HIV knowledge rather than the urban perspective. For instance, the selected studies and governmental statistics from the review were largely based on the agrarian populations of Ethiopia (Alene et al., 2004; HAPCO, 2008). According to Berhane et al. (2001), the rural population starkly differs on various social and health indicators in comparison to the urbanized centers of Ethiopia. Correspondingly, a recent demographic survey demonstrated a 100% gross enrollment rate (GER) for young boys and girls residing in urban dwellings (Rose, 2003). The GER measures the proportion of students enrolled in school to the total population of the corresponding school age (Kenya Institute for Public Policy Research and Analysis, 2001). Although 100% GER was reported, it is difficult to decipher the exact numbers who graduated. However, Rose reported a sizable gender difference in enrollment rate between rural areas in comparison to urbanized cities. For example, only 41.4% of girls were enrolled in primary school in

comparison to 62.7% boys (Rose, 2003). This difference in education may help explain the differences in HIV/AIDS knowledge between genders in rural settings. Kassie, Mariam and Tsui (2008), state that HIV knowledge is considerably higher for urban women (65.5%), in comparison to their rural counterparts (28.0%). Therefore, as enrollment rates vary in rural areas, literacy and HIV knowledge levels drastically change between rural and urban women.

HAPCO (2008) reports on the increased correlation of wealth and economic stability among the demographic characteristic of urban tertiary students, in comparison to the rural youth of Ethiopia. World Bank (2010b) associates the increased economic status of individuals with their level of education. Moreover, the World Bank (2010b) states only 2.4% of the intended age cohort (18-24 years) frequents a higher-level institution in Ethiopia. According to Yizengaw (2007), more than 71% of post-secondary students come from Ethiopian households in the top income quintile. Correspondingly, LMICs such as Mozambique and Nigeria reported similar statistics, whereby the majority of tertiary student's families were from a higher socioeconomic status (Hoang Linh & Viet Thuy, 2010; World Bank, 2010b)

The urban/rural dispersion of Ethiopia demonstrates the majority of the population (85%) reside in rural communities and live below the poverty line (Oxfam, 2010). The initial literature review for this study focused on the rural population; stark differences were found between characteristics of the rural population and study participants. The initial literature review suggested lower HIV knowledge levels among rural Ethiopian females in comparison to their male counterparts (Alene et al., 2004;

HAPCO, 2008). In contrast, the study results demonstrated no significant difference in HIV knowledge levels among the male and female tertiary students. These conflicting results could be associated with the contextual differences in socioeconomic status among rural populations and the specific study participants. Therefore, the subsequent section will highlight HIV knowledge levels among the specific population of tertiary students residing in urban centers.

According to the reviewed literature, several studies have compared HIV knowledge levels among both male and female students residing in urban and affluent societies to rural communities (Harding, Anadu, Gray, & Champeau, 1999; Nachege, Lehman, Hlatshwayo, Mothopeng, Chaisson, & Karstaedt, 2005; Tavoosi et al., 2004). For example, the cross-sectional study conducted by Nachege et al. found no significant gender difference in HIV knowledge levels among South Africans residing in urban centers. Although, the study participants were not students, the findings suggest a trend in comparable knowledge levels between middle-income male and females residing in urban centers. The study conducted by Harding et al. surveyed Nigerian university students regarding their HIV knowledge levels. The authors concluded gender was not a significant variable in determining HIV knowledge levels. Despite the dearth of Ethiopian literature, the selected studies suggest gender similarities in knowledge levels among urban residents and university students in Africa.

In summary, the results illustrated gender differences in demographic characteristics such as English language proficiency and relationship status. There were no differences between the two groups in HIV/AIDS attitude (empathy or avoidance)

scores. The groups were comparable in relation to HIV knowledge levels, whereby both male and female students scored low on the knowledge of sexual modes of HIV transmission. The subsequent section will discuss the socialization of gender and the implication of urban living on traditional gender roles in an increasing urbanized Ethiopia.

Connection to Theoretical Framework

As described in the initial literature review, the Social Theory of Power and Gender outlines the social construct of gender as three integrative dimensions of labor, power and cathexis (Connell, 1987). According to Regassa and Yusufe (2009), the increasing trend of rural to urban migration is changing the traditional labor roles in eastern Africa. For instance, the Ethiopian DHS survey found a comparable proportion of men and women in urban employment, whereby “...no significant difference was found in the proportion of men and women working in the professional, technical, or managerial jobs” (UNFPA, 2008, p.28). Thus, while a change in location has occurred, there has not been a corresponding change in the employment status of women in relation to men. However, the shifting trend from rural to urban migration has generated an increase in media exposure among women. According to Cherinet and Mulugeta (2002), young women in urban centers reported an increased utilization and proficiency with ICT in comparison to their rural counterparts. This suggests an increased English literacy secondary to the increased use of ICT. Correspondingly, several studies have highlighted the correlation between HIV literacy and media exposure. For example, a study conducted among Ethiopian students found various forms of media to be the most

identified source of HIV knowledge (Cheri et al., 2005). Therefore, female Ethiopian students in urban communities are likely to have an increased access to information about HIV/AIDS due to increased media exposure. This might help account for the lack of a difference between the knowledge levels of urban male and female students as compared to rural males and females.

Yet, despite these progressive advancements, the enduring disparity of power roles continues to persist in modern day Ethiopia. Regassa and Yusufe (2009) report an increase in incidences of marginalization and segregation among recent female migrants to urban cities. These reports align with Connell's theoretical dimension of cathexis, which outlines the power disparity in gendered relationships. Similarly, the cathexis role among young Ethiopians continues to denote risky sexual behavior among male Ethiopians, which adversely affects HIV rates among female Ethiopians (Adamu et al., 2003; Astatke et al., 2000; Molla et al., 2008). For example, the reviewed literature reported increased occurrences of multiple sexual partners among young male Ethiopians, whereas female were more likely to report monogamous relationships (Mulatu et al., 2000; Wouhabe, 2007). These findings corroborate the demographic data, which found male students to have higher rates of sexual activity and being single in comparison to female students.

Limitations

According to the reviewed research, the AAS and HIV-KQ-18 met the required criteria for validity and reliability in psychometric scale properties (Carey & Schroder, 2002; Froman & Owen, 1997). Although, the AAS was internally consistent ($\alpha=0.76$),

the literature suggests a cronbach's alpha above 0.80 increases the correlative effect between items and sets a gold standard in scale constructs (Sundin & Horowitz, 2002).

The HIV-KQ-18 was created as a tool to capture the general knowledge of HIV/AIDS in a succinct manner. However, according to Carey and Schroder (2002) it is not considered a tool to assess extensive HIV/AIDS knowledge. Carey et al. (1997) created the HIV-KQ-45, which preceded the HIV-KQ-18 scale. The questionnaire is a 45 item scale that further captures the comprehensive knowledge of HIV/AIDS in comparison to the brief HIV-KQ-18. For example, in the creation of the HIV-KQ-18 the authors exclude the various modes of HIV transmission (vector, blood products and mother to child) in order to focus on the sexual transmission of HIV (Carey & Schroder, 2002). However, for the purpose of this study the HIV-KQ-18 was chosen for its feasibility and brevity, which enabled the college and university students to complete the scale in an appropriate time. Furthermore, the HIV-KQ-18 focuses on the specific modes of sexual transmission, which is most salient among the target population of tertiary students.

Upon further appraisal, the sampling and design strategy denoted certain study limitations. At the college, the instructors primarily informed the students of the study. Therefore, a possible power gradient could have influenced the students to participate in the study. Yet, despite the college instructors' initial involvement, the administration of the survey was conducted in an enclosed room absent of any authoritative figures at both sites. The study employed a non-probabilistic sampling frame, by recruiting participants as a convenient sample. However, according to Hulley et al. (2001) this form of

sampling frame introduces a volunteer bias among participants. Similarly, the questionnaires were self-administered; therefore, social desirability cannot be excluded in the systematic biases of the study.

Although, the current study results yields important cues as to the knowledge and attitudes of tertiary students, the intent is not to generalize as the sample was not representative among the Ethiopian population. The purpose of the study was to capture a gendered viewpoint of HIV/AIDS among post-secondary students in an urban setting. Future research is needed to assess the HIV knowledge levels at multi-site post-secondary institutions in Ethiopia.

The statistical analysis demonstrated limitative factors, which constrained the final results of the study. For example, the demographic questionnaire enabled students to either write yes, no or non-applicable (NA) in regards to their sexual status. Unfortunately, in providing an NA option, the response resulted in a loss of 25% of the female sample size. Therefore, it is hard to assess the representative nature of sexual status among the female group, as it resulted in a loss of valuable data. Furthermore, the demographic questionnaires could have included further informative variables such as urban/rural status and income. Although, the demographic data provided ethnic origin it is hard to assess the specific urban or rural routes of their cultural heritage.

Conclusion

In summary, the discussion chapter highlighted key findings from the demographic and statistical analysis. The review of the literature demonstrated correlative indicators between HIV knowledge levels and increased ICT usage and urban

environments. However, further research is needed regarding the specific target population of post-secondary students and gendered HIV knowledge levels. The subsequent chapter will outline the specific implications of study findings vis-à-vis the current literature and will also provide final remarks.

Chapter 6: Implications, Conclusion and Reflection

This chapter will further discuss the study results in light of their specific nursing implications at a global health perspective. The ACLELRA model will be used to suggest certain knowledge translation initiatives according to the specific study findings and the student target population (Lavis et al., 2006). Final conclusions will be made to highlight key findings of the study and future areas of research. A self-reflective summary on the experience of collecting data at an international level will also be provided.

Implications

Overall, no significant difference between male and female students in their HIV knowledge test scores was found. This finding illustrates the need to have further observational studies that assess the specific gendered knowledge of HIV/AIDS among urban post-secondary students. As demonstrated in the literature review, the majority of the existing literature focused on rural youth instead of urban students. Therefore, future studies directed towards an urban student population would help compare and contrast the findings from this study.

This result is insightful in directing the content and delivery of HIV/AIDS educational resources. Because both genders scored similarly on the HIV knowledge questionnaire, the actual content of the materials for men and women could be the same. For instance, the educational content regarding the various sexual modes of HIV transmission could be the same regardless of the student group. The methods of delivery, however, could be reflective of cultural and social norms: separate sessions could be conducted with men and women to encourage open discussion. Program evaluation and cost-analysis research could then explore the cost-effectiveness of providing the same educational content for both male and female post-secondary students.

The results demonstrated the importance of addressing the avoidant HIV/AIDS attitudes towards people living with HIV/AIDS, especially among homosexual and promiscuous individuals. Brown, Trujillo and Macintyre (2003) highlight the need to firstly address the avoidant attitudes towards HIV/AIDS in order to change the HIV knowledge of a given population. Brown et al. suggest a multi-pronged approach not only centered upon HIV education but also focused on coping skill acquisition, counseling and demystifying HIV/AIDS misconceptions.

The box-plot diagrams (see Figure 1) conducted as part of the analysis revealed responses that were outside the general range of student responses. For example, analysis revealed that a minority of male students scored much lower on the HIV knowledge scores than did the majority of the other male subjects. These outliers suggest important phenomena for future research. For example, what accounts for these differences in knowledge levels? A mixed-method research design would be a useful method in exploring the qualitative experience among this minority group, which otherwise could not be measured by only quantitative methods. A mixed-method study would be advantageous in capturing the contextual meaning of these particular students and help explain their paradigm and context.

The results from the study revealed low knowledge levels on the various modes of HIV transmission among both male and female students. These salient findings demonstrate the need to address this knowledge gap among a known population vulnerable to risky sexual behavior. Despite the association of high socio-economic status with knowledge level among university students, the study results suggest a clear disconnect between students' academic knowledge and their awareness of the various modes of sexual transmission. Presumably, high socio-economic status and education are often associated with increased HIV/AIDS knowledge (Yerdaw et al.,

2002; Alemu et al., 2004). However, the findings of the study demonstrated lower transmission knowledge among post-secondary students. Therefore, the implications for nursing practice should focus on public health campaigns, which target the specific population of post-secondary students and their low knowledge on HIV transmission. The subsequent section outlines specific public health initiatives targeting post-secondary students.

The ACLELRA framework outlines the importance in assessing the specific climate of the intended research user (Lavis et al., 2006). For instance, HAPCO (2010) recommends interactive HIV/AIDS media programs as tailored initiatives to engage Ethiopian youths within an urban setting. Furthermore, a systematic review by Bertrand O'Reilly, Denison, Anhang and Sweat (2006) analyzed various strategies of HIV/AIDS communication programs and found the use of media devices a positive outcome for HIV transmission knowledge among a specific African student population. From a knowledge translation standpoint, Lavis et al. (2006) indicate an integrative model (push, pull, and exchange) in order to create large-scale knowledge platform for countrywide initiatives. As described by Lavis et al. a multi-level approach would be a productive strategy in addressing the gap in HIV/AIDS knowledge among post-secondary students in Ethiopia. For example, this urbanized population of post-secondary students would profit from various media initiatives, such as radio campaigns, email reminders and mobile message updates on HIV preventative measures. At the institutional level, academic faculty and peer-student facilitators are needed to facilitate an environment of active dialogue on HIV and the specific modes of transmission.

Conclusion

The knowledge and attitudes of HIV/AIDS are salient predictors in mitigating the high rates of HIV among young Ethiopians. The literature review highlighted increased sexual risk

behaviors among the specific population of urban male and female students. Although the initial literature review demonstrated varying gender knowledge among the rural population, the subsequent literature review revealed similarities in HIV knowledge levels between both genders. In congruence with this study results no significant knowledge difference was found between male and female students. The literature suggests the possible interaction in socioeconomic status among rural populations and the stark differences among the urban student population. However, male and female students in both sections scored low on HIV knowledge levels regarding the various modes of sexual transmission. These findings instill the need to incorporate tailor specific HIV/AIDS prevention programs among the specific urban student population.

Self-Reflective Journey

Completing graduate education is a journey of many experiences, both challenging and exhilarating. The added dimensions associated with conducting research at an international level added further complexity to this experience. The opportunity to collect data at an international level has taught me indispensable truths that extend far beyond a didactic learning approach. When looking back on this experience, one key component that was crucial in completing my data collection was the importance of maintaining an open and flexible frame of mind. I was living in a new environment with different cultural and social norms. I needed to be respectful of differences, and aware of my actions and resultant consequences. I realized the significance of firstly building relationships at the local level and then collaborating together with numerous partners for a shared goal.

I had the wonderful experience to stay with an Ethiopian family who graciously introduced me to key members of the community. The opportunity to live with a local family in southern Ethiopia helped me learn the tacit mores of the region, which were imperative in relationship building with the stakeholders of the community. This quickly contributed to my learning the importance of gaining access and acceptability before introducing my “research agenda”. For example, many of my first couple of weeks was spent sharing in traditional Ethiopian coffee ceremonies with the local members of the community or practicing customary greetings in the Amharic language. This enabled me to start the beginning stages of relationship building and dialoguing with both the college and the university.

During my stay in Ethiopia, I realized how much my western thinking mind was fixated on the outcome-oriented completion of my research rather than embracing an open process. At the time, I found this was a great challenge for me to overcome. However, now looking back I

made a conscious decision to embrace the unexpected and adapt to my surrounding environment. For example, it took me longer than anticipated to meet with the authorizing officials in Ethiopia. I did not realize that the majority of the officials were unavailable due to Ethiopia's upcoming campaign elections. As a result, I was unable to collect my data according to my predetermined schedule. Yet, this seemingly unexpected u-turn was the most memorable and enriching of my experiences in Ethiopia. Because of this "delay", I was able to meet with local young women and men who shared with me their viewpoints on HIV/AIDS. They also shared with me the current issues regarding sexual behavior in this particular community. My passion for understanding the knowledge and attitudes about HIV/AIDS of youth in Ethiopia was brought to the level of the individual. I felt my work could make a difference at the global level and at the individual level.

Due to the sexual content and taboo nature of the questionnaire, it was imperative to reach trust building and mutual respect in order to receive access with the college and university. I made it a priority to meet with the academic officials and find a mutual process to collect the data in a culturally sensitive manner. For example, due to the sexual content of the scales, it was suggested that male and female students be provided separate classrooms. This intervention helped facilitate students to answer the questions with more openness and to freely ask questions regarding the questionnaire content. I felt that I was truly capturing their perspective, one that may not have been captured in a method that distanced me from them as individuals.

As a novice researcher interested in global health, this experience has taught me the invaluable lesson of establishing a flexible and open approach in research while maintaining rigor. Collecting my thesis data in Ethiopia has enabled me to look beyond the ascribed "research plan" and strive for the implicit nuances which brings richness and a tacit viewpoint to

one's data. After a successful thesis defense, I plan to share my research results with the college and university in Ethiopia. I hope to continue to build upon this international relationship with future collaborations and follow-up research with the college and university.

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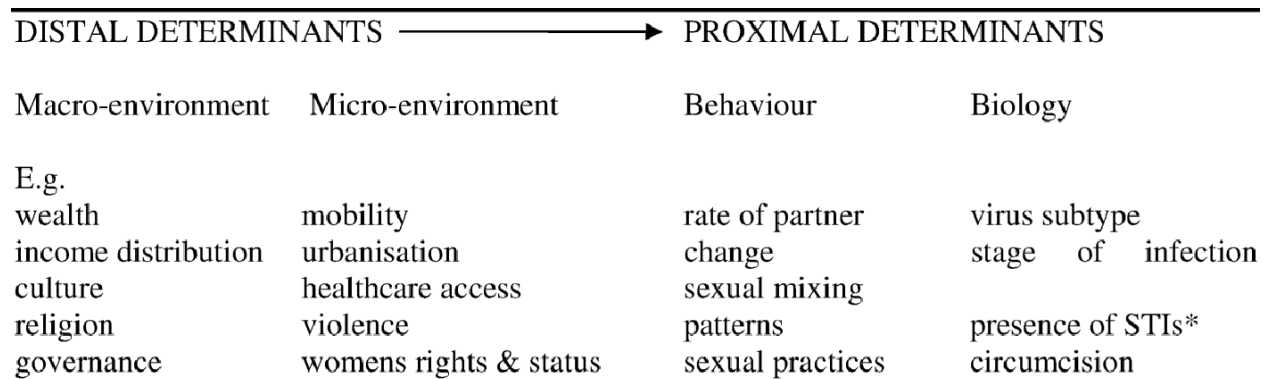
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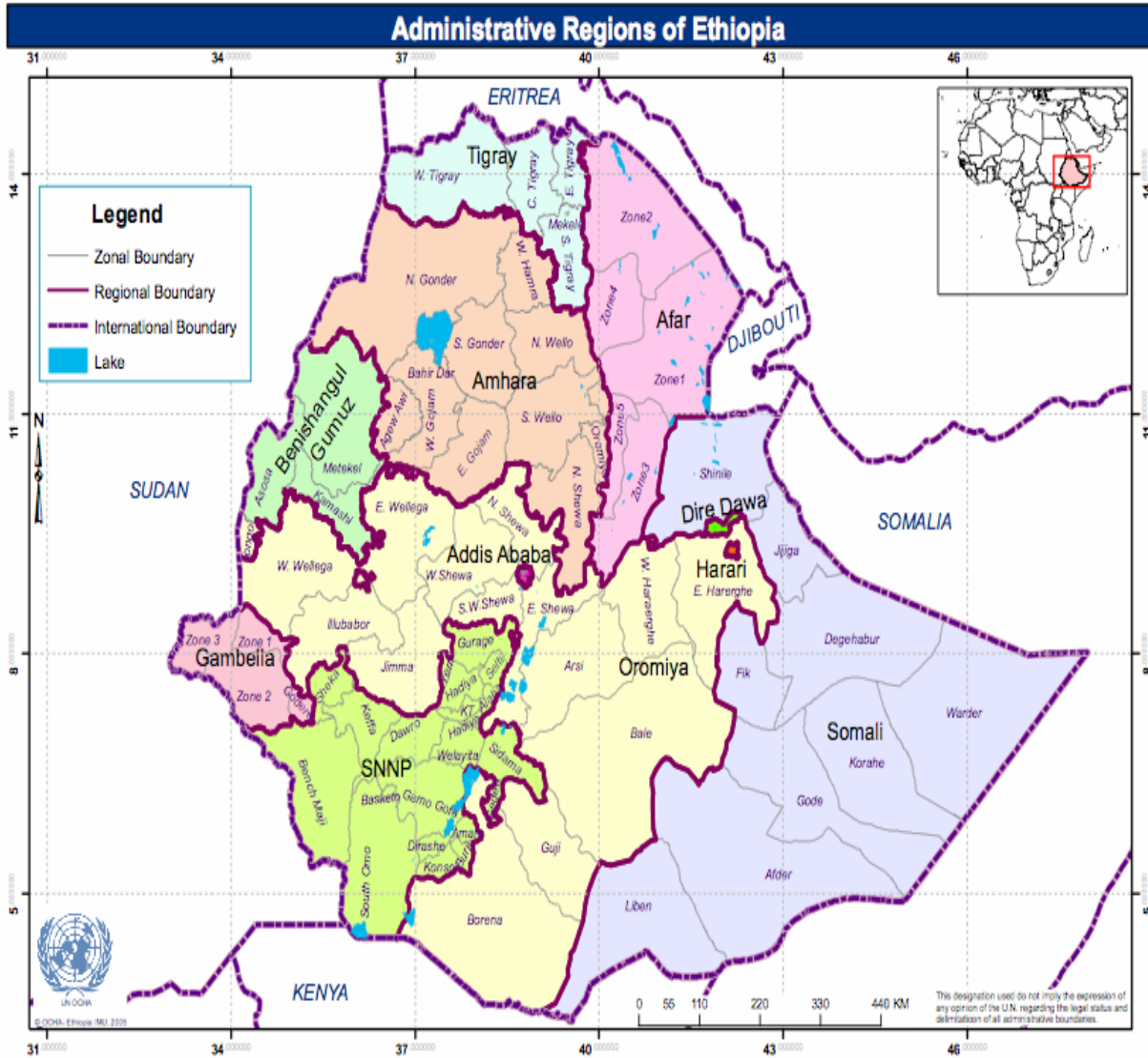
Appendix A



*STI = Sexually transmitted infection.

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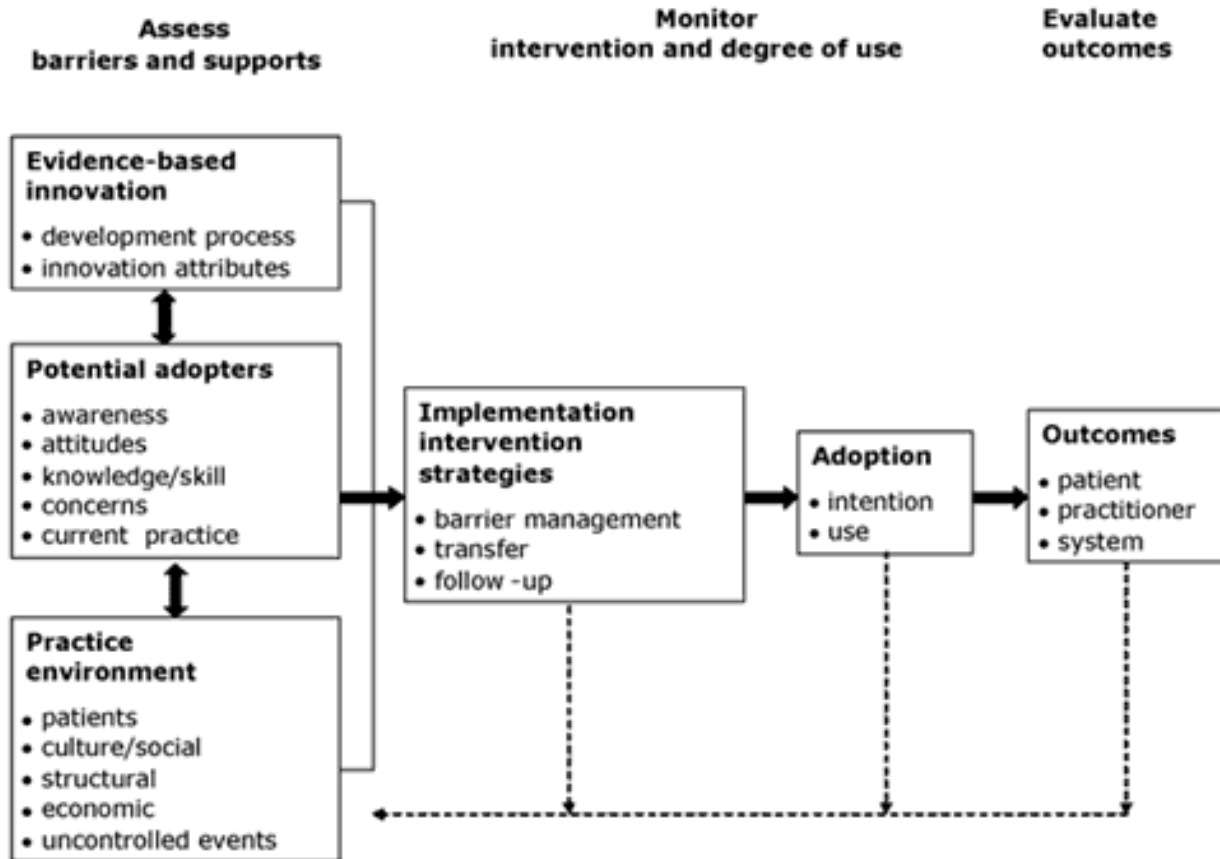
Appendix B



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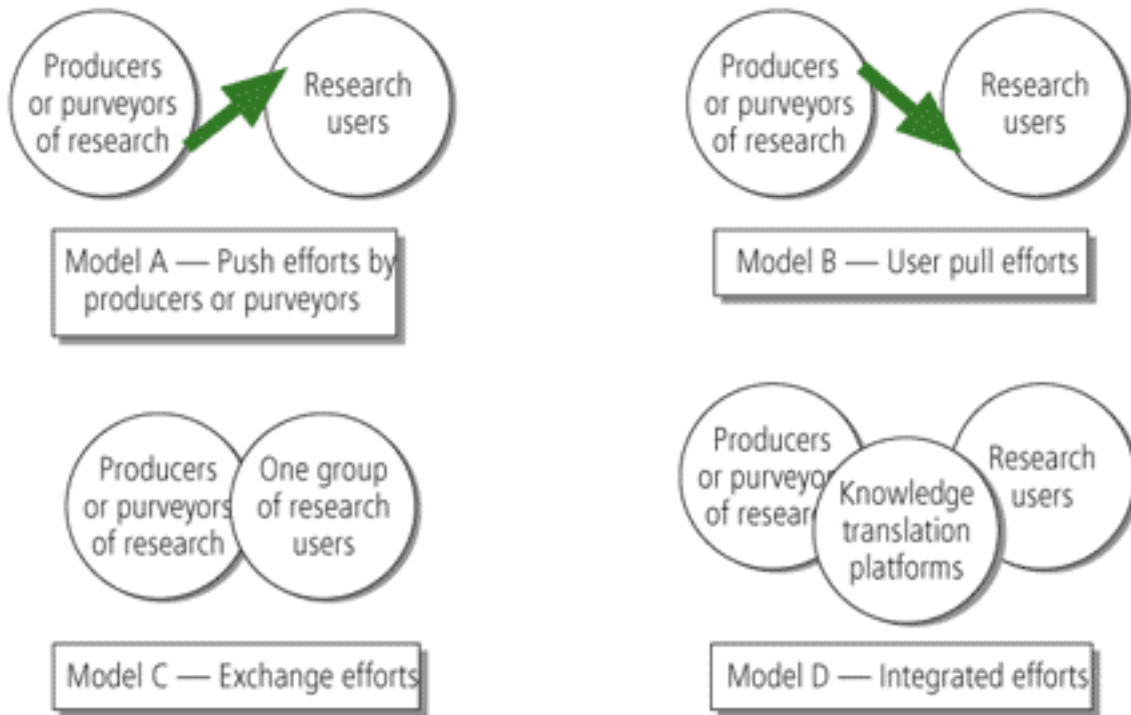
Appendix C



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Appendix D

Fig. 2. Models for linking research to action



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Appendix E

Demographic Data
Fill out or circle those that apply

Male____
Female____

Age:_____

Ethnic origin:_____
Language spoken:_____

Religion:_____

Occupation:_____

1. Sexually active

- 1.1 Yes_____
- 1.2 No_____
- 1.3 N/A_____

2. Marital Status

- 2.1 Single:_____
- 2.2 Dating:_____
- 2.3 Married:_____
- 2.4 Divorced:_____
- 2.5 Separated:_____
- 2.6 Widow:_____

3. Education

- 3.1 Elementary:_____
- 3.2 Secondary:_____
- 3.3 Preparatory;_____
- 3.4 College:_____
- 3.5 University:_____

4. Program:_____

Appendix F

Brief HIV Knowledge Questionnaire (HIV-KQ-18)

Instructions: Check mark the correct response

Item(s)	True	False
1. Coughing and sneezing DO NOT spread HIV. (T)		
2. A person can get HIV by sharing a glass of water with someone who has HIV.(F)		
3. Pulling out the penis before a man climaxes/cums keeps a woman from getting HIV during sex. (F)		
4. A woman can get HIV if she has anal sex with a man. (T)		
5. Showering, or washing one’s genitals/private parts, after sex keeps a person from getting HIV. (F)		
6. All pregnant women infected with HIV will have babies born with AIDS. (F)		
7. People who have been infected with HIV quickly show serious signs of being infected. (F)		
8. There is a vaccine that can stop adults from getting HIV. (F)		
9. People are likely to get HIV by deep kissing, putting their tongue in their partner’s mouth, if their partner has HIV. (F)		
10. A woman cannot get HIV if she has sex during her period. (F)		
11. There is a female condom that can help decrease a woman’s chance of getting HIV. (T)		
12. A natural skin condom works better against HIV than does a latex condom. (F)		
13. A person will NOT get HIV if she or he is taking antibiotics. (F)		
14. Having sex with more than one partner can increase a person’s chance of being infected with HIV. (T)		
15. Taking a test for HIV one week after having sex will tell a person if she or he has HIV. (F)		
16. A person can get HIV by sitting in a hot tub or a swimming pool with a person who has HIV. (F)		
17. A person can get HIV from oral sex. (T)		
18. Using Vaseline or baby oil with condoms lowers the chance of getting HIV. (F)		

Retrieved from Carey, P. M., & Schroder, K. (2002). Development and psychometric evaluation of the brief HIV knowledge questionnaire. *AIDS Education Prevention, 14*(2), 172-182.

Appendix G

AIDS Attitude Scale (AAS)

INSTRUCTIONS: Circle the response that best corresponds to how strongly you agree or disagree with the statement. The categories of response are Strongly Disagree (SD), Moderately Disagree (MD), Disagree (D), Agree (A), Moderately Agree (MA), and Strongly Agree (SA).

Item (s)	SD	MD	D	A	MA	SA
1. Most people who have AIDS have only themselves to blame.	SD	MD	D	A	MA	SA
2. Most people who have AIDS deserve what they get.	SD	MD	D	A	MA	SA
3. Hospital patients who are HIV positive should not be put in rooms with other patients.	SD	MD	D	A	MA	SA
4. If I had to have contact with someone with AIDS, I would worry about putting my family and friends at risk of contracting the disease.	SD	MD	D	A	MA	SA
5. Young children should be removed from the home if one of the parents is HIV positive.	SD	MD	D	A	MA	SA
6. I think patients with AIDS have the right to the same quality of care as any other patient.	SD	MD	D	A	MA	SA
7. It is especially important for hospital patients with AIDS to be treated in a caring manner.	SD	MD	D	A	MA	SA
8. I think people who are IV drug users deserve to get AIDS.	SD	MD	D	A	MA	SA
9. I think women who give birth to babies who are HIV positive should be prosecuted for child abuse.	SD	MD	D	A	MA	SA
10. Homosexuality should be illegal.	SD	MD	D	A	MA	SA

Item (s)	SD	MD	D	A	MA	SA
11. I feel more sympathetic toward people who get AIDS from blood transfusions than those who get it from IV drug abuse.	SD	MD	D	A	MA	SA
12. A homosexual hospital patient's partner should be accorded the same respect and courtesy as the partner of a heterosexual patient.	SD	MD	D	A	MA	SA
13. Hospital patients with AIDS should be treated with the same respect as any other patient.	SD	MD	D	A	MA	SA
14. If I found out that a friend of mine was a homosexual, I would not maintain the friendship.	SD	MD	D	A	MA	SA
15. I am worried about getting AIDS from social contact with someone.	SD	MD	D	A	MA	SA
16. I am sympathetic toward the misery people with AIDS experience.	SD	MD	D	A	MA	SA
17. I would like to do something to make life easier for people with AIDS.	SD	MD	D	A	MA	SA
18. I would do everything I could to support people with AIDS.	SD	MD	D	A	MA	SA
19. Children or people who get AIDS from blood transfusions are more deserving of treatment than those who get it from IV drug abuse.	SD	MD	D	A	MA	SA
20. I would be worried about my child getting AIDS if I knew that one of his teachers was a homosexual.	SD	MD	D	A	MA	SA
21. I have little sympathy for people who get AIDS from sexual promiscuity.	SD	MD	D	A	MA	SA

Retrieved from Froman, R. D., Owen, S. V., & Daisy, C. (1992). Development of measure of attitudes towards persons with AIDS. *Journal of Nursing Scholarship*, 24(2), 149-152.

Table 1: Demographic Results among Male and Female Students

Variable	Total (n, %)	Male, n (%)	Female, n (%)
Sex	227(100.0)	101 (44.5)	126 (55.5)
Age Cohort (yrs)			
18-21	186 (82.0)	79 (78.2)	107 (84.9)
22-25	33 (14.5)	17 (16.8)	16 (12.7)
26-30	8 (3.5)	5 (5.0)	3 (2.4)
*Total	227	101	126
Ethnic Origin			
Amhara	79 (39.8)	24 (27.0)	55 (50.5)
Oromo	31 (15.7)	17 (19.1)	14 (11.1)
Tigray	12 (6.1)	6 (6.7)	6 (5.5)
Gurage	25 (12.6)	11 (12.4)	14 (12.8)
Wolaita	14 (7.1)	10 (11.2)	4 (3.7)
Kembata	21 (10.6)	7 (7.9)	14 (12.8)
Sidamo	16 (8.1)	14 (15.7)	2 (1.8)
Total	198	89	109
Religion			
Orthodox	114 (53.0)	42 (42.8)	72 (61.5)
Protestant	74 (34.4)	38 (38.8)	36 (30.8)
Muslim	22 (10.2)	18 (18.4)	4 (3.4)
Catholic	5 (2.3)	0 (0.0)	5 (4.3)
Total	215	98	117
Education			
University	107 (47.1)	48 (47.5)	59 (53.2)
College	120 (52.9)	53 (52.5)	67 (46.8)
Total	227	101	126
Sexually Active			
Yes	61 (36.5)	43 (51.2)	18 (21.7)
No	106 (63.5)	41 (48.8)	65 (78.3)
Total	167	84	83

(Table 1 continued)

Relationship			
Single	159 (70.0)	83 (82.2)	76 (60.3)
Dating	53 (23.3)	14 (13.9)	39 (31)
Married	9 (4.0)	0 (0.0)	9 (7.1)
Divorced	2 (0.8)	0 (0.0)	2 (1.6)
Separated	4 (1.8)	4 (4.0)	0 (0.0)
Total	227	101	126
Number of Languages Spoken			
1	134 (59.0)	89 (70.6)	45 (44.6)
2	56 (24.7)	24 (19.0)	32 (31.7)
>3	37 (16.3)	13 (10.3)	24 (23.8)
Total	227	126	101

* Totals are different because of missing variables.

Table 2: Number and Percentages of Correct Answers in HIV Knowledge Items (HIV-KQ-18) among Male and Female Students

HIV Knowledge Scores	Male	Female
Correct Answers: n(%)	n=101	n=126
1. Coughing and sneezing do not spread HIV. (T)*	82(81.2)	114(90.5)
2. A person can get HIV by sharing a glass of water with someone who has HIV. (F)*	91(90.1)	110(87.3)
3. Pulling out the penis before a man climaxes keeps a woman from getting HIV during sex. (F)	71(70.3)	82(65.1)
4. A woman can get HIV if she has anal sex with a man. (T)	14(13.9)	7(5.6)
5. Showering, or washing one's genitals/private parts, after sex keeps a person from getting HIV. (F)	92(91.1)	116(92.1)
6. All pregnant women infected with HIV will have babies born with AIDS. (F)	78(77.2)	104(82.5)
7. People who have been infected with HIV quickly show serious signs of being infected. (F)	83(82.2)	108(85.7)
8. There is a vaccine that can stop adults from getting HIV. (F)	91(90.1)	114(90.5)
9. People are likely to get HIV by deep kissing, putting their tongue in their partner's mouth, if their partner has HIV. (F)	40(39.6)	52(41.3)
10. A woman cannot get HIV if she has sex during her period. (F)	86(85.1)	97(77.0)
11. There is a female condom that can help decrease a woman's chance of getting HIV. (T)	86(85.1)	104(82.5)
12. A natural skin condom works better against HIV than does a latex condom. (F)	28(27.7)	34(27.0)
13. A person will not get HIV if she or he is taking antibiotics. (F)	81(80.2)	96(76.2)
14. Having sex with more than one partner can increase a person's chance of being infected with HIV. (F)	88(87.1)	115(91.3)
15. Taking a test for HIV one week after having sex will tell a person if she or he has HIV. (F)	72(72.3)	102(81.0)
16. A person can get HIV by sitting in a hot tub or a swimming pool with a person who has HIV. (F)	70(69.3)	90(71.4)

(Table 2 continued)

17. A person can get HIV from oral sex. (T)	42(41.6)	51(40.5)
18. Using Vaseline or baby oil with condoms lowers the chance of getting HIV. (F)	59(58.4)	47(37.3)

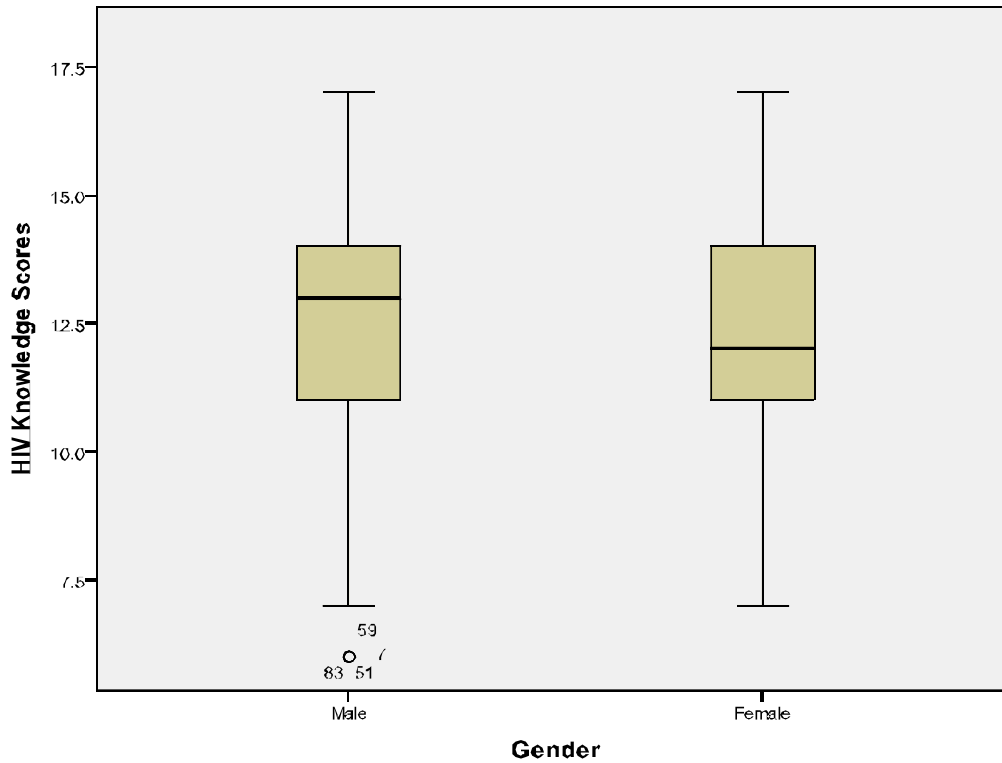
* True and False

Table 3: Mean(SD) of HIV/AIDS Attitudes (AAS) among Male and Female Students

Aids Attitude Scale: Mean(SD)	Male n=101	Female n=126
1. Most people have AIDS have only themselves to blame.*	3.5(1.7)	3.7(1.5)
2. Most people who have AIDS deserve what they get.*	3.3(1.7)	3.4(1.6)
3. Hospital patients who are HIV positive should not be put in rooms with other patients.*	3.1(1.8)	2.7(1.8)
4. If I had to have contact with someone with AIDS, I would worry about putting my family and friends at risk of contracting the disease.*	2.1(1.4)	2.3(1.6)
5. Young children should be removed from the home if one of the parents is HIV positive.*	1.9(1.5)	1.8(1.5)
6. I think patients with AIDS have the right to the same quality of care as any other patient.	5.3(1.3)	5.3(1.4)
7. It is especially important for hospital patients with AIDS to be treated in a caring manner.	5.0(1.5)	5.0(1.6)
8. I think people who are IV drug users deserve to get AIDS.*	2.7(1.5)	3.1(1.6)
9. I think women who give birth to babies who are HIV positive should be prosecuted for child abuse.*	3.2(1.8)	3.2(1.7)
10. Homosexuality should be illegal.*	5.0(1.6)	5.3(1.4)
11. I feel more sympathetic toward people who get AIDS from blood transfusions than those who get if from IV drug abuse.	4.0(1.8)	4.6(1.7)
12. A homosexual hospital patient's partner should be accorded the same respect and courtesy as the partner of a heterosexual patient.	3.8(1.6)	3.7(1.7)
13. Hospital patients with AIDS should be treated with the same respect as any other patient.	4.5(1.7)	4.5(1.8)
14. If I found out that a friend of mine was a homosexual, I would not maintain the friendship.*	3.9(1.9)	4.3(1.8)
15. I'm worried about getting AIDS from social contacts with someone.*	2.2(1.6)	2.0(1.5)
16. I am sympathetic toward the misery people have with AIDS experience.	5.0(1.4)	4.8(1.6)
17. I would like to do something to make life easier for people with AIDS.	5.1(1.3)	5.5(5.7)
18. I would do everything I could to support people with AIDS.	5.0(1.5)	5.0(1.4)
19. Children or people who get AIDS from blood transfusions are more deserving of treatment than those who get it from IV drug abuse.*	3.6(1.8)	4.1(1.8)
20. I would be worried about my child getting AIDS if I knew that one of his teachers was a homosexual.*	3.1(1.8)	3.0(1.7)
21. I have little sympathy for people who get AIDS from sexual promiscuity.*	3.3(1.6)	3.5(1.7)

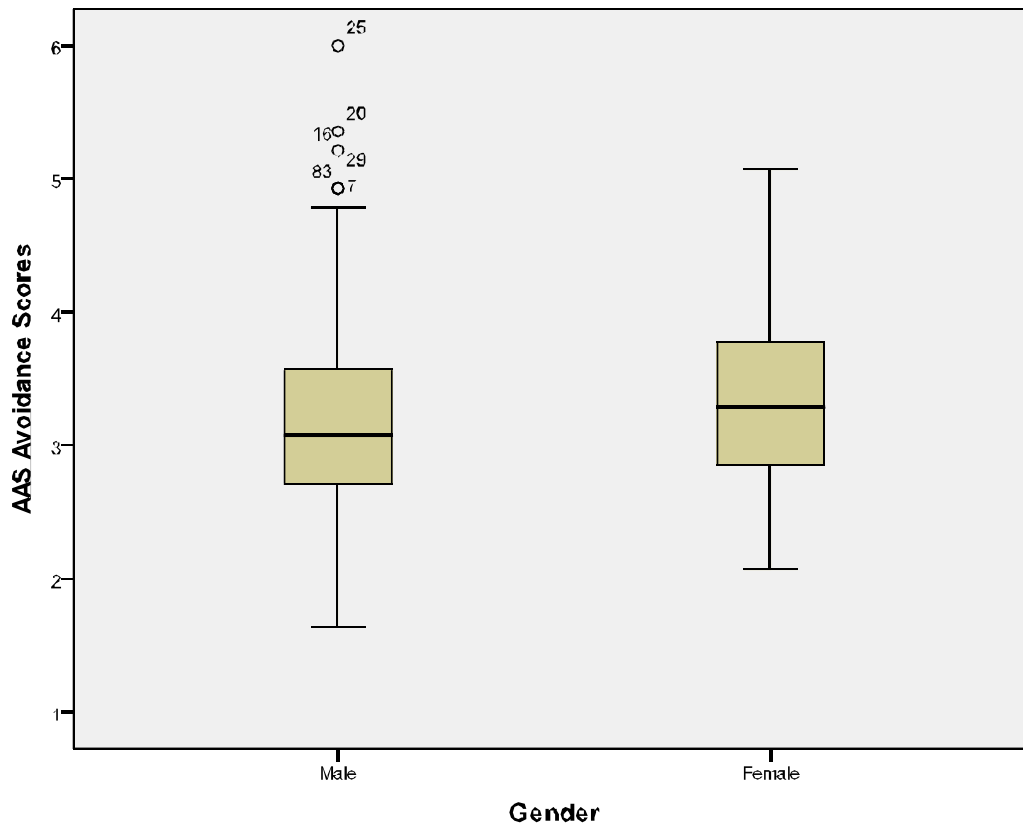
* Avoidant Aids Attitude Items

Figure 1: HIV Knowledge Scores (HIV-KQ-18) among Male and Female Students



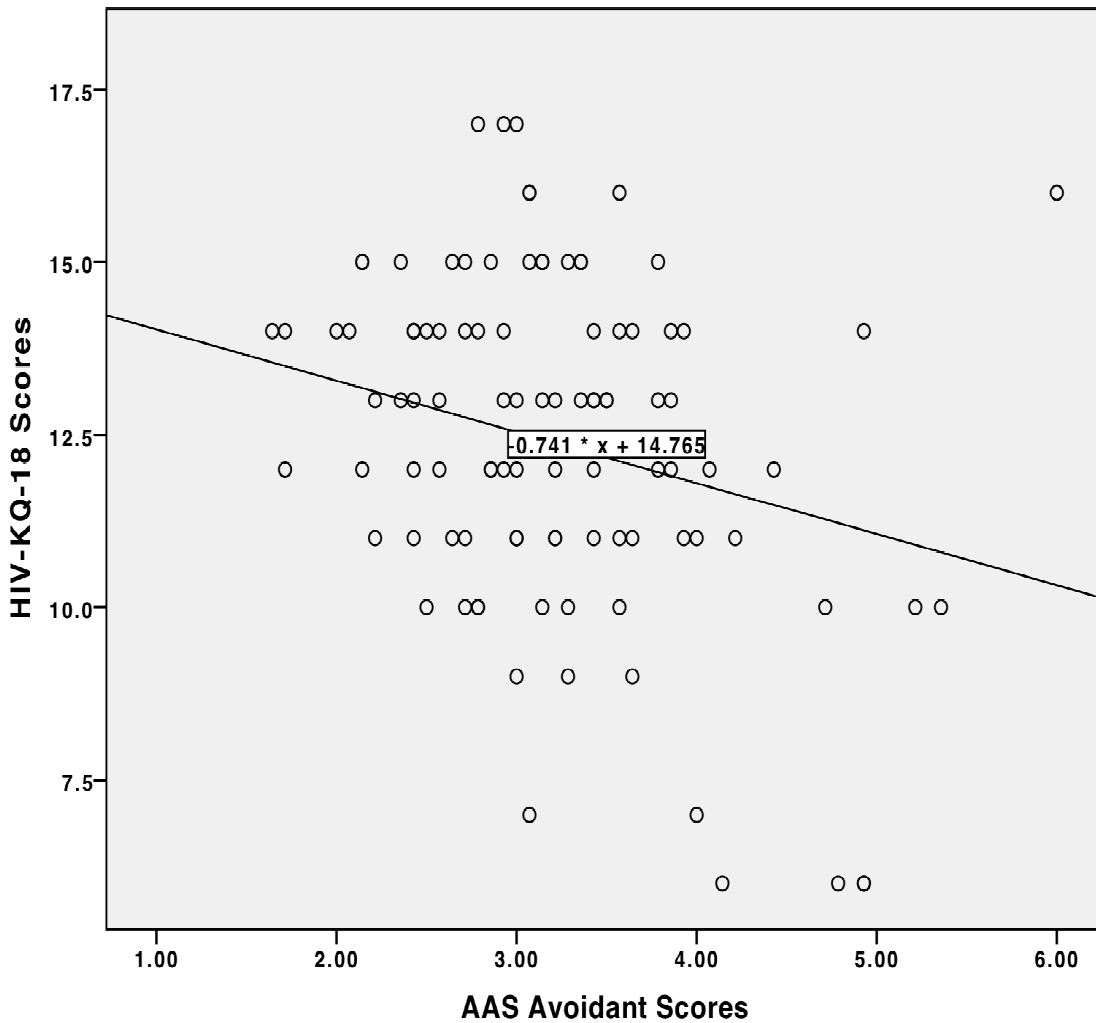
Note. The box-plot diagram illustrates that female students achieved a lower median score between the lower and upper quartiles. However, male students scores demonstrate an increased number of outliers outside the minimum lowest value of HIV knowledge scores.

Figure 2: AAS Avoidant Scores among Male and Female Students



Note. The box-plot diagram illustrates a lower median score among the male group in comparison to the female group. However, the male group box demonstrates outliers outside the maximum range values.

Figure 3: Regression Coefficients for HIV Knowledge (HIV-KQ-18) and AAS Avoidant Scores



Note. The best fit line demonstrates a negative relationship between HIV knowledge scores and avoidant attitude scores (AAS). Therefore, as avoidant attitude scores increase, HIV knowledge levels decrease.

