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Predictors of HIV-Related Risky Sexual Behaviors among High School Students: Socioecological Perspective

Gizachew Kebede Bassore
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Walden University

College of Health Sciences and Public Policy

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Gizachew Kebede Bassore

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Walden University
2022

Abstract

Predictors of HIV-Related Risky Sexual Behaviors Among High School Students:

Socioecological Perspectives

by

Gizachew Kebede Bassore

MPH, University of Roehampton, United Kingdom, 2017

MSc, National University of Ireland, Galway, 2005

BSC, Public Health, Jimma Institute of Health Sciences, 1991

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Public Health

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Abstract

An increase in risky sexual behaviors among high school students in Ethiopia has led to an increase in risk for contracting human immunodeficiency virus (HIV) among this population. A knowledge gap exists regarding the predictors of HIV-related risky sexual behaviors among high school students in the predominantly rural and underserved area of southern Ethiopia. The socioecological model was the theoretical framework for this research. A quantitative cross-sectional design was employed to examine the association between a set of independent variables, including personal, parental, religious factors, and risky sexual behaviors among a sample of high school students. Primary data were collected using a self-administered questionnaire from 374 participants using a stratified random sampling technique. Descriptive statistics, bivariate, and multivariate logistic regressions were computed using SPSS Version 25. The prevalence of risky sexual behavior among the school adolescents was 30.04/1,000 population. The associations between HIV comprehensive knowledge and place of residence and risky sexual behavior were not statistically significant. A statistically significant association was found between condom use self-efficacy and risky sexual behavior, $P = 0.048$, $OR = 2.23$, 95% CI [1.007, 4.925] when the covariates were held constant. After controlling for covariates, maternal monitoring ($P = 0.027$, $OR = 2.84$, 95% CI [1.011, 8.004]) and frequent participation in religious activities ($P = 0.03$, $OR = 0.240$, 95% CI [0.094, 0.612]) significantly predicted lower odds of risky sexual behavior. The research findings could lead decision makers to address the determinants of risky sexual behaviors to address increasing HIV infections, which could lead to positive social change in the study area.

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Dedication

I dedicate this research to my late father, Kebede Bassore, mother, Ashure Kabeto, and uncle, Tesfaye Kabeto. They not only raised and nurtured me but also instilled life dreams to aspire and achieve big.

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Chapter 1: Introduction to the Study

Introduction

Despite substantial progress achieved in reducing the burden of human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS), it continues to be a major public health and social challenge across the globe. Worldwide, HIV/AIDS appears to affect youth and adolescents disproportionately, and Ethiopia, located in the horn of Africa, has been one of the hardest-hit countries by the multiple impacts of HIV/AIDS in the past three decades.

In 2018, there were an estimated 770,000 HIV-related deaths and 1.8 million people who were newly infected globally (The Joint United Nations Program on HIV/AIDS [UNAIDS], 2018; World Health Organization[WHO], 2019). Even though HIV affects all population groups worldwide, there has been a notable disparity in geographic and demographic characteristics of the affected populations underscoring the important role of socioeconomic inequalities in HIV/AIDS outcomes worldwide (Magadi, 2016). For instance, of the 1.8 million new HIV infections reported globally in 2018, about 1,170,000 (65%) were from Sub-Saharan African countries (UNAIDS, 2018). From these new infections in Sub-Saharan African countries, 800,000 (68.4%) were from the eastern and southern sub-region of the continent, which accounts for the highest-burden of HIV/AIDS in the African continent (UNAIDS, 2018). The current review of sustainable development goal 3 (SDG3), however, highlighted a gradual decline of incidence of HIV in Sub-Saharan Africa among adults aged between 15 and 49

from 339 per 100,000 in 2010 to 214 per 100,000 people in 2017 (United Nations[UN], 2019).

Young people in the age group of 15-24 accounted for 594,000 (33%) of an estimated 1.8 million new infections that occurred in 2018 globally (UNAIDS, 2018). The adolescence period is characterized by decisions that are often reactionary to satisfy immediate needs, which increase their engagement in risky practices including sexual behaviors. The fact is that the wider social and environmental factors that surround the transitional development of the youth appear to influence their sexual behavior and increase their vulnerability to HIV infections (Kharsany & Karim, 2016; Pettifor et al., 2018).

In 2017, an estimated 720,000 people were living with HIV/AIDS in Ethiopia (Federal HIV/AIDS Prevention and Control Office [FHAPCO], 2018; Kibret et al., 2019). The most recent Ethiopian demographic and health survey (EDHS) report highlighted a substantial variation in geographical and demographic characteristics in the HIV prevalence rate in the country. For instance, the 2016 EDHS, a national population-based survey, revealed that HIV prevalence in Gambella regional state and Addis Abeba and Dire Dawa city administrations were substantially higher when compared with other national regions (Central Statistical Authority[CSA] & ICF, 2017).

Notwithstanding a consistent disparity in gender, geography, and population groups, the overall HIV prevalence among the population aged 15-49 has shown a substantial decline in Ethiopia. The prevalence declined from 3,300 per 100,000 in 2000 to 900 per 100,000 populations in 2016 at the national level (CSA & ICF, 2017).

Similarly, the antenatal-based sentinel HIV surveillance highlighted that the prevalence declined from 12,400 per 100,000 in 2001 to 1,700 per 100,000 populations in 2014 among the adolescents aged 15-24 years in the country (Ethiopian Public Health Institute[EPHI], 2015). The burden of HIV-related death rate also declined from 149.8/100,000 in 2005 to 11.7/100,000 populations in 2018 (Deribew et al., 2019; UNAIDS, 2018). The decline in the burden of mortality was also heterogeneous, with some geographic areas of Ethiopia still experiencing a higher death rate. However, empirical data that shows this variation in mortality across different regions in the country of Ethiopia is lacking because of weak vital event registration systems in the country.

The Ethiopian government's accelerated multidisciplinary HIV interventions in the past two decades appear to have influenced a reduction in HIV/AIDS prevalence (Planning commission & United Nations Ethiopia, 2015). This multidisciplinary approach was a response to address the social determinants of HIV/AIDS, which commenced in 1998 with systematically engaging all the government sector offices, donors, civil society organizations, women organizations, faith-based organizations, and people living with HIV/AIDS. FHAPCO and Federal Ministry of Health [FMoH] provided strong leadership in guiding the interventions that reduced the HIV prevalence in the country (Planning Commission & United Nations Ethiopia, 2015).

There are significant remaining challenges in the control of HIV/AIDS and ending the pandemic in the country. One of the challenges appears to be the increasing trend of new infections in clusters of geographic areas and among key populations

(female sex workers and prisoners) in Ethiopia (Assefa et al., 2019; Girum et al., 2018; Kibret et al., 2019). Moreover, there is emerging evidence of increasing risky sexual behaviors among young adolescents in secondary schools, which is consistent with the onset of their sexual behavior (UNAIDS, 2018; Wana et al., 2019). Likewise, a lower level of comprehensive HIV knowledge among young adolescents aged 15-24 years and higher levels of discriminatory attitudes towards people living with HIV/AIDS may continue to place a substantial challenge in the efforts to end the pandemic (Assefa et al., 2019).

In Ethiopia, the available evidence from the national survey only provides a crude estimate of HIV-related behavioral outcomes and its determinants at the national and regional levels of the country. Nevertheless, such crude prevalence estimates at the national and regional levels in Ethiopia need interpretation with caution as it may mask the notable spatial and population differences at the lower (zonal and district) levels of the country (Idele et al., 2014). There exist 55 ethnic groups in the southern regional state of Ethiopia who have their own distinct cultural beliefs, norms, and values. The fact is that cultural beliefs and attitudes of people could affect their access to and utilization of HIV/AIDS services, and their health and behavioral outcomes (Napier et al., 2014). Therefore, the crude national and regional level HIV prevalence estimates may not reflect the actual magnitude of the problem and behavioral outcomes in different parts of the southern regional state of Ethiopia.

The HIV/AIDS prevalence appeared to increase, albeit its decline at the national level, in the southern nations regional state of Ethiopia. According to CSA and ICF

(2017), the HIV/AIDS prevalence increased from 200 per 100,000 in 2005 to 400 per 100,000 populations in 2016 in southern nations and nationalities regional state of Ethiopia. The increase in the HIV prevalence may partly be a result of increasing risky sexual behaviors among adolescents (Wana et al., 2019). Additionally, there is evidence that adolescents in the age group of 15-24 years were affected disproportionately by HIV infections. For instance, the 2014 reports on antenatal care sentinel surveillance in Ethiopia revealed the HIV prevalence of 1700 per 100,000 in the age group of 15-24, which is still high (EPHI, 2015). Geremew et al. (2018), in their systematic review and meta-analysis of HIV prevalence among pregnant women, also reported a pooled HIV prevalence of 5,740 per 100,000 populations in Ethiopia.

The previous studies that examined the determinants of risky sexual behaviors among young adolescents and high school students mainly focused on the major cities of Ethiopia. There is a knowledge gap on the determinants of HIV-related risky behaviors among high school adolescents in the Kembata zone, which is one of the densely populated, predominantly rural, and underserved areas located in the central part of southern nations regional state in Ethiopia.

The purpose of this study was to examine the association between a set of independent variables, including personal, parental, religious, and the outcome of risky sexual behaviors among a sample of high school students at Angacha district in southern Ethiopia. The examination of the broader determinants of risky sexual behavior among high school students is expected to provide important evidence to decision-makers to

design effective interventions that protect the youth from HIV in the underserved and predominately rural area of southern Ethiopia, leading to positive social change.

Background

Ethiopia developed its HIV/AIDS policy in 1998 almost a decade after the first HIV case was reported, and the already fragile health system was overwhelmed by the increasing number of cases. The policy provided a framework to guide a holistic approach to control the HIV pandemic and promote the health of people living with the virus (Federal Democratic Republic of Ethiopia [FDRE], 1998). The policy also envisaged addressing the broader social and structural determinants of HIV/AIDS by systematically engaging all governmental and non-governmental organizations (FDRE, 1998). It appeared that interventions that addressed the behavioral, biomedical, and structural determinants of HIV/AIDS in different settings were successful in reducing HIV infections, related mortality, and its social impacts (UNAIDS, 2018).

The government of Ethiopia has been implementing high impact interventions in its multidisciplinary HIV/AIDS response plan (FMoH, 2015). It included interventions that address both behavioral and structural determinants of the disease. For instance, the interventions that addressed the structural determinants of HIV/AIDS include (a) strengthening the health system; (b) improving access to and utilization of HIV/AIDS services; (c) mainstreaming of the HIV response in the development plan of all government sectors; (d) policies that empower women and youth; (e) policies that protect the rights of people living with HIV/AIDS; (f) economic and psychosocial support for the people living with HIV/AIDS, and (g) mobilizing more internal and external resources to

the program (FMoH, 2015; FDRE, 1998). The biomedical interventions against the HIV pandemic included (a) behavior change information, education, and communication with the priority given to the high-risk population including women and youth; (b) prevention and control of other sexually transmitted diseases to accelerate the control and prevention of HIV/AIDS; (c) HIV screening and testing; (d) sterilization and disinfection in the health care settings to reduce HIV infections related to health care; (e) HIV/AIDS surveillance, notification, and reporting; (f) Medical treatment of cases; and (g) research and development to strengthen the evidence base for the prevention and control of the pandemic (FDRE, 1998).

The above interventions have resulted in reductions in HIV incidence from 3,300 per 100,000 in 2000 to 900 per 100,000 in 2016 among general populations (CSA & ICF, 2017; FHAPCO; 2018; Kibret, 2019); and from 12,400 per 100, 000 in 2001 to 1,700 per 100,000 populations in the age group of 15-24 years in Ethiopia in 2014 (EPHI, 2015). HIV-related mortality has also shown a notable decline in the country from 149.8/100,000 in 2005 to 11.8/100,000 populations in 2018 (Deribew et al., 2019; UNAIDS, 2018), with the trend of mortality reductions summarized in Table 1 below.

Table 1*Trend of HIV-Related Death Rate in Ethiopia, 1990–2018*

Year	HIV-related deaths per 100,000 population	Source
1990	22.6	Deribew et al., 2019
1995	81.6	Deribew et al., 2019
2000	145.8	Deribew et al., 2019
2005	149.8	Deribew et al., 2019
2010	64.3	Deribew et al., 2019
2015	27.2	Deribew et al., 2019
2016	24.2	Deribew et al., 2019
2017	16.6	Kibret et al., 2019
2018	11.7	UNAIDS, 2018

In 2017, Ethiopia was listed among eleven countries (Austria, Bahamas, Cambodia, Denmark, Ethiopia, France, Italy, Nepal, Netherlands, Portugal, and Spain) globally that achieved a benchmark incidence prevalence ratio of 0.03, which indicates a decline in the rate of new infections and progress in the coverage of treatment for people living with the virus (UNAIDS, 2018). Furthermore, Ethiopia is one of the few countries that achieved the HIV/AIDS-related targets of millennium development goals (MDGs). According to FMOH (2015), the country has achieved the MDG targets of halting and reversing the pandemic by reducing HIV infections and death among adults by 90% and 50%, respectively, when compared with the 2000 rates. Nevertheless, the progress made in reducing the HIV/AIDS-related mortality was not paralleled with reducing new HIV infections and risky sexual behaviors among adolescents (Assefa et al., 2019; FHAPCO, 2018). An increasing trend of new HIV infections was observed after 2008 among all age groups in general and adolescents in particular (Deribew et al., 2019; Girum et al., 2018).

Kibret et al. (2019) also reported an increase of new HIV infections by 3,748 in 2017 from the number in 2016. Moreover, the HIV prevalence increased from 200 per 100,000 in 2005 to 400 per 100,000 populations in 2016 in southern nations regional state (CSA & ICF, 2017).

Despite the fact that in 2014, the UNAIDS and global partners set the 90-90-90 target to reduce HIV new infections in 2020 globally (Levi et al., 2016; Assefa et al., 2019), there is evidence to suggest resurgence of HIV new infections in Ethiopia (Assefa et al., 2019; Girum et al., 2018; Wana et al., 2019). An increasing trend of new HIV infections was observed after 2008 among all age groups in the country, yet a higher incidence was observed among adolescents (Deribew et al., 2019; Girum et al., 2018). Kibret et al. (2019) also reported an increase of 3,748 new HIV infections in 2017 compared to the number of new cases infection in 2016. Additionally, the HIV prevalence increased from 200 per 100,000 in 2005 to 400 per 100,000 populations in 2016 in the southern regional states (CSA & ICF, 2017).

A recent review that aimed to assess the program progress and challenges in the 90-90-90 fast track targets of HIV/AIDS found that Ethiopia is not yet on track to reduce HIV new infections and discriminatory attitudes (Assefa et al., 2019). The 90-90-90 fast track targets include (a) 90% of the people living with the HIV/AIDS should know their HIV status; (b) 90% of those who know their HIV status should be on treatment; and (c) 90% should reach a virus suppression level (Assefa et al., 2019). Ethiopia being not in the track reflects the gaps in the interventions against HIV/AIDS which are the result of government complacency in the past achievements, significant reductions in the funding

for HIV/AIDS from donors, and weak school-based sexual health programs that may account for the increasing new HIV infections in the country (Assefa et al., 2019; FHAPCO, 2018; Federal Ministry of Education [FMoE], 2015; Wana et al., 2019).

Young adolescents appeared to particularly be vulnerable to HIV infections because of the complex interactions of social determinants of health surrounding their sexual life. The upstream determinants of health include social policies and cultural values that create and maintain socioeconomic position among individuals and population groups (Solar & Irwin, 2010). Likewise, the proximal determinants of health include biological and behavioral factors that influence the health outcomes of the individuals and population groups (Solar & Irwin, 2010). The fact is that both upstream and proximate social determinants of health interact to notably influence the health behavior of the population groups (Edwards & Collins, 2016; Solar and Irwin, 2010). It is known that health risks and outcomes are not evenly distributed in the population. The social determinants of health may cause a social gradient where population groups have differential access to and utilization of health care, material conditions, social support, and behavioral options. Consequently, these populations become more vulnerable to engage in risky health behaviors and have poorer health and behavioral outcomes (WHO Commission on Social Determinants of Health, 2008).

Further, the interaction of proximate and upstream determinants of health could create inequalities in the health and behavioral outcomes of adolescents, which in turn, could increase their vulnerability to HIV infections (Edwards & Collins, 2016; Friel & Marmot, 2011). Additionally, there is a growing concern that young people may be left

behind with the HIV pandemic because of the poorly targeted interventions, including HIV testing and a steady decline of HIV-related mortality among these populations when compared with the older age groups (UNAIDS, 2016).

Comprehensive HIV knowledge is of paramount importance for adolescents to understand its mode of transmission and take the needed healthy actions. After three decades of interventions, the level of comprehensive HIV knowledge among adolescents in the age group of 15-24 remains appallingly low from the 2010 target of 95 % of that was agreed upon during multilateral discussion at the United Nations in 2001 (United Nations General Assembly [UNGASS], 2002; Idele et al., 2014). While they have a higher rate of HIV infection, adolescent girls, however, have a consistently lower rate of comprehensive HIV knowledge when compared to the young boys of the same age (Idele et al., 2014). For example, the EDHS revealed that the disparity at the level of comprehensive HIV knowledge at the national level and in southern regional state, one of the administrative regions in Ethiopia, remains unacceptably low (CSA & CSF, 2017). It appeared that 1746 (39.6%) adolescent boys and 1492 (24.3%) of girls in the age group of 15-24 from the survey participants had comprehensive knowledge about HIV/AIDS at the national level (CSA & ICF, 2017). Similarly, in the southern region, only 849 (35.8%) boys and 516 (15.7%) of girls among the survey participants in the same age group had a comprehensive HIV knowledge (CSA & ICF, 2017). Furthermore, at the national level, only 1370 (39.4%) and 1868 (14.7%) of survey participants in urban and rural areas respectively had comprehensive knowledge about HIV in Ethiopia (CSA &

ICF, 2017). The survey did not report the urban-rural disparity in a comprehensive HIV knowledge in the southern regional state of Ethiopia.

Findings from the EDHS revealed a very high risky sexual behavior among adolescents. For instance, the 2016 EDHS revealed that only 203 (50.5%) of men and 38(21.8%) of women, in the age group of 15-24, who had sexual intercourse with a casual partner reported using condoms in the last 12 months before the survey (CSA & ICF, 2017). A study in western Cameroon, Kisumu district of Kenya, and Eastern Cape of South Africa reported adequate understanding about HIV transmission and prevention among high school students yet also lower condom use (Adeboye et al., 2016; Nubed & Akoachere, 2016; Ochieng et al., 2011). A similar survey in Uganda reported that 672 (42.8%) of women and 479 (57%) men in the age group of 15-24 had sexual intercourse with a casual partner using condoms in the last 12 months. Likewise, 45.7% of women and 53.3 % of men had comprehensive knowledge about HIV (Ugandan Bureau of Statistics & ICF, 2018). The findings suggest that the prevalence of condom use in Uganda is relatively higher when compared with similar survey findings in Ethiopia. Such inequities in HIV health behaviors appear to be associated with social determinants of health surrounding their sexual life, such as place of residence, level of education, income, and employment status (Idele et al., 2014; Friel & Marmot, 2011).

To better understand and explain the progress and challenges of the HIV pandemic and the influence of social determinants of health, it is imperative to understand the sociopolitical and economic context of Ethiopia. Ethiopia, the oldest independent and the 2nd most populous country in Africa, has a projected population of

108,113,150 in 2020, of which 50.6% are males (CSA, 2013; Central Intelligence Agency [CIA], n.d.). The population in the age group of ≥ 15 years who can read and write constitute about 52%, while the adolescents in the age group of 15-24 years constitute 20.6% of the total population. It has one of the fastest-growing population with a birth rate of 31.6/1000 population and fertility rate of 4.3 per women in 2017 (World Bank, 2019). Similarly, the majority (83.9%) of the population lives in the rural area of the country. There are three dominant religions in the country where Orthodox Christians, Islam, and Protestants constitute 43.5%, 33.9%, and 18.6%, respectively, while traditional indigenous beliefs constitute 3.7% of the population (CSA, 2010).

Ethiopia has a federal parliamentary political system constituting nine regional states (Oromia, Amhara, Southern Nations and Nationalities, Tigray, Somali, Afar, Benishangul Gumz, Gambella, and Harari) and two city administrations (Addis Abeba and Dire Dawa). The country has about 80 ethnic groups with a very diverse culture and values. According to CSA (2010), the major ethnic groups are Oromo (34.4%), Amhara (27%), Somali (6.2%), Tigre (6.1%), and Sidama (4%). Of the 80 ethnic groups, 56 of them live in the southern nations and nationalities regional state. Kembata is one of the ethnic groups located in the south-central part of the southern regional state where this study was conducted. The ethnic diversity could also imply distinct cultural beliefs and values of each ethnic group, which could affect their access to and utilization of HIV/AIDS services and related behavioral and health outcomes (Napier et al., 2014).

Even though the country achieved one of the fastest-growing economies in the past ten years, largely because of the massive government investment, it still remains one

of the poorest countries in the world due both to rapid population growth and low starting base of economic growth. According to WHO (2016), the human development index (HDI), which indicates the overall improvement in socioeconomic achievement, remains one of the lowest in the world. Moreover, 29.6% of its population remains below the absolute poverty line, and 25.2% of the youth in the age group of 15-24 remains unemployed. Ethiopian economy largely depends on hand-to-mouth agriculture, which accounts for about 35% of the GDP and employs about 85% of the labor force in 2017. The agriculture sector also contributes about 81% of the total export earnings of the country (CIA, n.d.). The summary of key socioeconomic indicators is presented below in Table 1.

Table 2*Key Health and Socioeconomic Indicators of Ethiopia*

Indicator	Percentage/ratio/number
Total population (2020 est)	108,113,150
Youth (15-24 yrs)	20.6%
Population growth rate (2020 est)	2.56 births/1000
Birth rate	31.6 births/1000
Death rate	5.9 deaths/1000
Urban population	21.7%
GDP (2019 est)	92 billion USD
GDP per Capita (2017 est)	2,200 USD
Population living below the absolute poverty line (2014)	29.6%
Human development index rank	174
Gender inequality index rank	129
Unemployed youth (15-24 yrs)	25.2%
Youth dependency ratio	70.6%
Literacy rate among adults ≥ 15 yrs	51.8 percent
Total health expenditure as percentage of GDP	4.88%
Maternal mortality ratio (2018 est)	401/1000 LBs
Life expectancy at birth (2016 est)	65.5 (both sexes)
HIV adult prevalence (2018 est)	1%
People living with HIV/AIDS (2018 est)	690,000

Source: CIA, n.d.

In this study, I examined the determinants of risky sexual behaviors among high school students at the Angacha district of the Kembata zone in the southern nations and nationalities regional state of Ethiopia. The study generates important evidence to fill the knowledge gap in the literature as the previous studies only focused on identifying the predictors of risky sexual behavior in major urban areas in Ethiopia and other resource-poor settings. Further, the available evidence from the national surveys in Ethiopia only reported national and regional level estimates of behavioral outcomes related to HIV. Such a crude estimate may mask the existing disparities in health and behavioral outcomes in a culturally diverse part of southern Ethiopia. Therefore, this study

investigated the personal, parental, and religious determinants of risky sexual behavior among high school students in the study area.

Problem Statement

Adolescents in Ethiopia are at increased risk of HIV infection because of their biological and socioeconomic conditions, which disproportionately affect their engagement in risky sexual behaviors. There has been recent evidence of increasing HIV-related risky behaviors among high school students in Ethiopia. In their cross-sectional study of Adama town in central Ethiopia, Wana et al. (2019) reported that 95.7% of students reported knowing that HIV could be transmitted through unsafe sex. However, this knowledge among students was not associated with safer sexual practices. For instance, 110 (47.3%) students who indicated having had a sexual experience did not use condoms during their first sexual encounter. In Wana et al.'s study, age, peer pressure, substance use (khat, cigarette, and alcohol), and access to social media were significant predictors of risky sexual behavior. A similar research in western Cameroon, Kisumu district of Kenya, and Eastern Cape of South Africa reported adequate understanding about HIV transmission and prevention among high school students and low condom use (Adeboye et al., 2016; Nubed & Akoachere, 2016; Ochieng et al., 2011). In another study in the United States, parental monitoring predicted decreased risky sexual behaviors (Mahat et al., 2016).

Nevertheless, the studies in Ethiopia and other resource-poor countries were focused mainly on urban areas and did not adequately investigate the personal, parental, and religious factors that could predict risky sexual behaviors among high school students

in predominantly rural areas like Kembata zone. Therefore, this study aims to fill the knowledge gap in the literature with a particular focus on the underserved and predominantly rural area of Kembata in southern Ethiopia.

Purpose of the Study

The purpose of this study was to examine the association between a set of independent variables, including personal (comprehensive HIV knowledge, condom use self-efficacy, and place of residence), parental (parental monitoring and communication), religious (frequency of participation in religious activities), and outcome of risky sexual behaviors, among a sample of high school students at Angacha rural district, Kembata zone, in southern Ethiopia. Primary data from high school students were collected on the broader risk factors and outcome variables to examine suggested associations (Creswell, 2014). The examination of the broader determinants of risky sexual behavior among high school students could provide important evidence to decision makers for designing effective interventions that protect youth from HIV in underserved and predominately rural areas of southern Ethiopia, leading to positive social change.

Research Questions and Hypotheses

The following were the main research questions and hypotheses of the study:

RQ1: Is there an association between comprehensive HIV knowledge and the sexual behavior of students?

H_0 1: There is no statistically significant association between comprehensive HIV knowledge and the sexual behavior of students.

H_{a1} : There is a statistically significant association between comprehensive HIV knowledge and sexual behavior of students.

RQ2: Is there an association between condom use self-efficacy and the sexual behavior of students?

H_{02} : There is no statistically significant association between condom use self-efficacy and the sexual behavior of students.

H_{a2} : There is a statistically significant association between condom use self-efficacy and the sexual behavior of students.

RQ3: Is there an association between the place of residence and the sexual behavior of students?

H_{03} : There is no statistically significant association between the place of residence (urban vs. rural) and the sexual behavior of students.

H_{a3} : There is a statistically significant association between the place of residence and the sexual behavior of students.

RQ4: Is there an association between parental monitoring and the sexual behavior of students?

H_{04} : There is no statistically significant association between parental monitoring and the sexual behavior of students.

H_{a4} : There is a statistically significant association between parental monitoring and the sexual behavior of students.

RQ5: Is there an association between the frequency of participation in religious activity and the sexual behavior of students?

H₀₅: There is no statistically significant association between the frequency of participation in religious activities and the sexual behavior of students.

H_{a5}: There is a statistically significant association between the frequency of participation in religious activities and the sexual behavior of students.

Theoretical and Conceptual Framework

The theoretical framework for this research was the socioecological model, which was later developed into a theory in the 1980s (Bronfenbrenner, 1994; Kilanowski, 2017). Theories provide a basic conceptual framework to examine the association between the independent and dependent variables. Theories also establish the basis for the explanation of the research questions (Creswell, 2014). The socioecological model posits that behavior is affected by the interaction between the characteristics of the individual, the community, and the environment (Bronfenbrenner, 1994; Richard et al., 2011). In the socioecological model, behavior is viewed as affected by both different levels of ecological influences and an outcome of interest (Bronfenbrenner, 1974, as cited in McLeroy et al., 1988; Salazar et al., 2010). Furthermore, Salazar et al. (2010) contended that using the socioecological approach in the study of risky sexual behavior among adolescents helps comprehend the broader determinants at different levels of the model apart from the individual characteristics.

Likewise, the model explains the determinants of health behavior or risk factors at three levels: micro, meso, and macro levels. The micro level of the model explains the individual characteristics and face-to-face reciprocal interactions in specific settings. At the same time, the meso system alludes to the individual's interrelations among the

various settings they are involved (Bronfenbrenner, 1974, as cited in McLeroy et al., 1988). The focus of this research was on the micro and meso levels of the socioecological model to examine the association of the broader determinants of risky sexual behavior among high school students. More specifically, I only focused on the underlined variables in the micro level (comprehensive HIV knowledge, condom use self-efficacy, place of residence, and parental monitoring and communication) and meso level (frequency of participation in religious activities).

Table 3

Levels of Socioecological Model, Characteristics, and Related Variables

Level of the socioecological model	Characteristics	Constructs/Variables
Micro level	Intrapersonal factors	Age, sex, knowledge and beliefs (comprehensive HIV knowledge), attitude, condom use self-efficacy, grade level, place of residence
	Interpersonal factors	Parental education status, income, ownership of radio, television, communication with parents, parental monitoring
Meso level	Community and environmental factors	Peer relationship, participation in religious activities, frequency of participation in religious activities, access to social media, TV films, chewing khat, drinking alcohol, access to health services, participation in the HIV clubs
Macro level	Policy-related issues	Availability of school AIDS policy/guidelines, financing of school HIV interventions, policy on access to condoms, policy support to people living with HIV

Nature of the Study

In this study, I employed a quantitative approach using a cross-sectional study design to answer the research questions. The quantitative research method is grounded in postpositivist philosophical assumptions (Babbie, 2011). The quantitative approach in epidemiological studies helps examine associations between various independent variables and one outcome, thereby answering the research questions (Babbie, 2011; Creswell, 2014). For instance, in this quantitative study, the association between independent variables related to personal (comprehensive HIV knowledge, condom use self-efficacy, and place of residence), parental (parental monitoring), and religious characteristics (frequency of participation in the religious activity) of students were examined with the dependent variable (protected or unprotected sex; Creswell, 2014). The measurement of the variables provides empirical data that can be analyzed and meaningfully interpreted (Creswell, 2014). The cross-sectional design helps measure the risk and outcome variables at the same time and provides the prevalence estimate of risky sexual behaviors among the study population (Sedgwick, 2014).

Definition of Terms

The terms used in this study were defined as follows.

Antenatal care: The care given to pregnant women and adolescent girls by skilled health care professionals to ensure safer pregnancy and health condition for mother and baby. This care aims to identify risks and pregnancy-related concurrent infections and diseases to reduce risks and improve pregnancy outcomes (World Health Organization [WHO], 2016).

Comprehensive HIV knowledge: Knowing the consistent use of condom during sexual intercourse and having a faithful and reliable partner can reduce the risk of contracting HIV infection, knowing that a healthy-looking person can have HIV, and rejecting the two most common misconceptions about the transmission or prevention of HIV (Central Statistical Authority [CSA] & ICF International, 2016).

Condom use self-efficacy: The perceived capability of a person to obtain and use a condom for safe sexual practice (Bandura, 1995).

Disparity in health outcomes: Noticeable difference in health outcomes among countries, regions, and within the characteristics of population group (age, gender, place of residence, education), and others (Wilkinson & Pickett, 2010).

Health literacy: The knowledge and social skills that determine the motivation and ability to gain access to, understand and use information that promotes and maintains good health and behavioral outcomes (WHO, 1998).

Incidence prevalence ratio of HIV/AIDS: The number of new infections occurring per year in a population divided by the number of people living with HIV in the same population (Ghys et al., 2018; UNAIDS, 2016). This ratio is an indicator of the rate of new infections and coverage of antiretroviral treatment for people living with the virus.

Incidence rate: The number of new events in a defined population over a specific period (numerator) divided by the population at risk for the event at that time (Szklo & Nieto, 2014).

Pandemic: An epidemic occurring worldwide crossing international borders and usually affecting a large number of people (Last, 2001).

Parental monitoring and advice of adolescents: The knowledge, follow up, and supervision of adolescents' behaviors and activities that includes some restricting rules by parents and involves discussing behaviors and activities with the adolescents (Bronfenbrenner, 1994; Keijsers, 2016).

Prevalence rate: Measures the frequency of an existing outcome (new and old cases or events) at a given period (numerator) divided by the specific population at the same period (Szklo & Nieto, 2014).

Proximate determinants of health: Established or postulated risk factors that are proximal in time and/or distance before the outcome of interest. The causal pathway is defined to allow the assertion of the linkage between the last factor and the outcome (Last, 2001).

Risky sexual behavior: Unprotected sexual practice without consistent use of condoms, which could increase the chance of contracting HIV.

Sentinel surveillance: Surveillance based on selected population samples chosen to represent the relevant experience of particular groups. Antenatal care-based HIV sentinel surveillance, involving a limited number of carefully selected sites, has been used to estimate the prevalence of HIV among adolescents (Last, 2001; WHO, n.d.).

Social determinants of health: Socioeconomic circumstances under which people are born, grown, live, work, and age. These conditions are mostly responsible for the differences in health outcomes of population groups and inequities among and within countries (WHO, n.d.).

Social efficiency: An intervention that has a beneficial effect at the community or societal level (Getzen, 2013).

Social gradient of health: A socioeconomic condition in which a notable difference in health and behavioral outcomes exists between the most and least advantaged individuals or groups of a population that appears to be the result of unfair social and economic structures of society (Wilkinson & Pickett, 2010).

Social support: Social relationships with individuals or groups that provide supportive resources (emotional, instrumental, informational, and appraisal) that appear to be beneficial to the health and well-being of adolescents (Williams et al., 2004).

Upstream determinant of health: An established or postulated risk factor that is distal and untraceable in position in the causal pathway to the outcome of interest (Last, 2001).

Assumptions

In this study, I assumed that high school students in the study area would have access to the ongoing HIV/AIDS prevention and control program in the country and a basic knowledge about HIV/AIDS and where to obtain essential services and information when needed. Ethiopia is among countries that successfully reduced the HIV morbidity, mortality, and related socioeconomic impacts of the pandemic despite the recent increase in new infections and risky sexual behaviors among high school students. I also assumed that respondents would provide truthful and valid responses to all the questions so as not to affect the internal validity of the study. I maintained the anonymity and confidentiality

of the information to increase the truthfulness of the responses provided by the respondents.

Moreover, I assumed that the randomly selected respondents were representative enough to make valid inferences about the population of interest. I also assumed that the adequate sample size could ensure adequate statistical power for the study to enable it to detect the actual magnitude of change on the outcome variable because of the effect of independent variables. I assumed the questionnaire used was reliable. Further, I assumed that the primary data collected were accurate and complete to answer the research questions.

Scope and Delimitations

Delimitation includes restricting the scope and determining the boundaries of a study (Theofanidis & Fountouki, 2019). Hence, this study was limited to the problem statement, theoretical perspective, research questions, and variables selected. While unprotected sexual practice equally increases the risk of unwanted pregnancy and other sexually transmitted diseases, I was focused on examining the risk of acquiring HIV infection following risky sexual practices. Moreover, I focused on the micro and meso levels of the socioecological model to examine the predictors of risky sexual practice among high school students enrolled in Grades 9–12 at the selected high school during the time of the study. Additionally, I only used primary quantitative data obtained from the students to answer the research questions.

Limitations

This study was not without some limitations. First, cross-sectional studies cannot be used to infer causality because of the difficulty of determining the temporal sequence between the risk factors and the outcome. Hence, an attempt to infer the observed association between the independent and dependent variables of the study could lead to a temporal bias (Szklo & Nieto, 2014). Second, because premarital sex is not a socially desirable behavior in many cultures, some respondents may have concealed their experiences of exposure to a risky sexual behavior leading to a social desirability response bias, which in turn, results in a lower prevalence of risky sexual behavior in the study area. However, the use of self-administered questionnaire in this study should have reduced the social desirability bias as it provided privacy and anonymity of information for the respondents.

Third, the exposure factors not measured in this study at all levels of the socioecological model and unknown to me could have confounded the association between the independent and dependent variables, leading to a spurious relationship. Fourth, inaccurate responses to sensitive questions could also have caused a measurement bias, resulting in misclassification of the independent variables. Lastly, the present study only focused on unprotected heterosexual vaginal sex as a risky sexual behavior. Other modes of risky sexual behaviors that increase the vulnerability of adolescents to HIV infections were not included. Notwithstanding the above limitations, this research has a better external validity because of a larger sample. Further, this study contributes to the

knowledge base in the literature on the prevalence and predictors of risky sexual behavior among school adolescents in the underserved part of southern Ethiopia.

Significance

The evidence generated from the study can inform decision makers of the school, ministry of education, ministry of health, and civil societies to design effective sexual health promotion programs that could empower students to protect themselves from HIV and other sexual health-related problems. Moreover, the sexual health promotion programs at schools may have a ripple effect (positive externality) to positively impact the community for sustainable social change (Getzen, 2013; Laureate Education, 2015). For instance, students who are empowered with life skills to take healthy action on sexual health-promoting behaviors could also protect their community from HIV infections. Therefore, the outcome of the research is expected to benefit the students and the community at large.

Moreover, this study could help define the extent of HIV-related risk factors in the study area and inform action that contributes to addressing the social problem. The findings of the study could help in building knowledge and learning for all stakeholders involved in the HIV/AIDS response. Similarly, the findings of the study could also fill the knowledge gap in the field and provide the basis for further studies.

Summary

Despite notable achievements in reducing the incidence and prevalence of HIV/AIDS, this significant public health and social problem persists in Ethiopia. The HIV prevalence declined from 3,300 per 100,000 in 2000 to 900 per 100,000 in 2016 in

Ethiopia. Similarly, the HIV-related death rate declined from 145.8/100,000 in 2000 to 11.7/100,000 in 2018. Nonetheless, the gains Ethiopia made in the past two decades were heterogenous; some geographic areas and population groups continue to suffer the impacts of HIV/AIDS. Emerging evidence indicates that adolescents and young adults ages 15–24 are affected disproportionately by HIV infections because of socioeconomic and environmental conditions surrounding their sexual life. Previous studies in urban areas in Ethiopia and other resource-poor settings have highlighted increasing risky sexual behaviors among high school students. In this study, I examined the personal, paternal, and religious determinants that influence sexual behavior among high school students in a predominantly rural area of the southern region of Ethiopia.

Chapter 2 includes a detailed description of the origin and major theoretical propositions of the theory for this study. I also provide a detailed review of current literature on the related constructs/variables of interest and summarizes major themes in the literature related to this study.

Chapter 2: Literature Review

Introduction

The purpose of this study was to examine the association between a set of independent variables, including personal (comprehensive HIV knowledge, condom self-efficacy, and place of residence), parental (Parental monitoring and advice), religious (frequency of participation at religious activities), and the outcome of risky sexual behaviors among a sample of high school students at Angacha district in southern Ethiopia. The examination of the broader determinants of risky sexual behavior among high school students may provide important evidence to decision makers and help them design effective interventions that protect youth from HIV in the underserved and predominately rural area of southern Ethiopia, leading to positive social change. In Chapter 2, I provide a detailed description of the origin and major theoretical propositions of the selected theory, a detailed review of current literature on the related constructs/variables of interest, and a summary of the major themes in the literature related to this study.

Literature Search Strategy

In this study, I searched for current peer-reviewed literature related to socioecological predictors of risky sexual behaviors among high school students and adolescents. The sources for the literature included various electronic databases, government, and nongovernmental organization websites. The electronic databases for the current literature search included PubMed, Medline, EBSCO, CINAHL, Google Scholar, PsycINFO, and ProQuest Health and Medical Collection. The organizational

websites searched were WHO, CDC, UNAIDS, World Bank, United Nations sustainable development goals (SDGs), and Ethiopia Central Statistical Authority. Additionally, literature in this study included seminal works without limiting the date of publication. I also used literature from reference lists of published studies and other credible sources on the organizational websites.

I used the following terms in the literature search to identify related peer-reviewed journal articles: *predictors of risky sexual behaviors AND high school students, socioecological predictors of risky sexual practices AND students, socioecological model, ecological perspectives, ecological models, determinants of risky sexual behavior, religiosity AND risky sexual behavior among adolescents, Ethiopia, Africa, comprehensive HIV knowledge, attitude, and practices of HIV AND high school students, and parental monitoring AND sexual practices among students*. The literature review includes cross-sectional and longitudinal studies relevant to the topic under study.

Theoretical Foundation

In this study, I used a socioecological model as the theoretical framework. The theory posits that behavior is affected by interactions between the characteristics of the individual, the community, and the environment (Bronfenbrenner, 1994). The model explains the determinants of a health behavior or risk factors at three levels: micro, meso, and macro. The micro level of the model represents the intrapersonal and interpersonal factors; the meso level informs about the community factors that influence the individual behavior (Bronfenbrenner, 1994). The socioecological model recognizes the multiple

social and environmental influences and social determinants of health that shape individual behavior.

Historical Perspective of Socioecological Model

In the 1970s, Bronfenbrenner (1994) first introduced the concept of an ecological paradigm based on previous studies conducted to understand the effects of neighborhoods on child development. Later in 1989 and 1990, Bronfenbrenner (1994) developed the concept of ecological paradigm in human development into a theoretical concept of an ecological model. This theory proposes that human development occurs as a process in the interdependent interaction between the human organism and the immediate environment (Bronfenbrenner, 1994). Bronfenbrenner further highlighted that the human development process as an outcome appears to be a function of the reciprocal interplay between the environmental context and the intrapersonal and interpersonal characteristics of individuals.

Furthermore, individuals are part of larger social systems with multiple reciprocal influences in the system. The socioecological theory recognizes these reciprocated relationships between the individual and the environment that influence health outcomes (Sallis et al., 2008, as cited in Golden & Earp, 2012). Unlike the narrower view and scope of previous studies by developmental psychologists, the socioecological model acknowledges health outcomes as a result of multiple levels of influences in the environment (Bronfenbrenner, 1994).

Accordingly, the socioecological model, as a theory, provides a conceptual framework to examine the association between these influences (independent variables)

and the outcome (dependent variable) and help understand and explain the phenomenon of interest under study (Creswell, 2014). The socioecological model posits that behavior is affected by the interaction between the characteristics of the individual, the community, and the environment (Bronfenbrenner, 1994; Richard et al., 2011). In this instance, the socioecological model recognizes that multiple social and environmental influences shape individual behavior.

The socioecological perspective has received considerable interest in the current view of inequalities in the population health outcomes as a result of social determinants of health. Unlike previous research approaches that have examined health-related outcomes as a result of influence from individual-level characteristics, the socioecological model provides a framework to examine the behavior of individuals in their socioecological context (DiClemente et al., 2005). The model provides essential knowledge of multiple levels of influences associated with risky sexual behaviors among adolescents (Rizvi et al., 2020).

McLaren and Hawe (2005) further highlighted the inextricable reciprocal relationship between the social context and the behavior of the individual. The knowledge of the setting in which the behavior occurs could better predict the behavior compared to individual characteristics (McLaren & Hawe, 2005). Furthermore, multiple levels of influences appear to shape an individual's behavior, and these influences include intrapersonal characteristics, interpersonal processes, and immediate community contexts (McLaren & Hawe, 2005; Richard et al., 2011).

The socioecological model explains the social determinants of health or behavioral outcomes at three levels: micro, meso, and macro. The micro level of the model includes intrapersonal and interpersonal characteristics. This level includes personal attributes that are proximal in the process of influencing and shaping the sexual behavior of adolescents (Muchimba, 2019; DiClemente et al., 2005; McLeroy et al., 1998; Bronfenbrenner, 1994). According to Bronfenbrenner (1994), intrapersonal factors include the personal characteristics that influence behavior and related health outcomes, including age, gender, knowledge, self-efficacy, beliefs, attitudes, skills, and spirituality (as cited in McLeroy et al., 1988). The intrapersonal level of the model provides a framework to understand the factors that influence the behavior of individuals. Designing interventions that modify the intrapersonal level influences can help the individual comply with the desired health behavior. Therefore, the intrapersonal level of the socioecological model demonstrates behavior as an outcome of the interaction with the personal characteristics and the social context in which the individual lives (Max et al., 2015; McLeroy et al., 1998). While the intrapersonal level determinants could directly influence the sexual behavior of adolescents, it also interacts with the other levels of the model to increase the risk of engaging in unsafe sexual practices.

Furthermore, the interpersonal level of the model refers to the influence of immediate family context on the behavior of adolescents. The interpersonal level includes family income, education status of parents, parental monitoring and advice to the adolescents, and adolescents' closeness and communication about sexual matters with parents. For instance, Mahat et al. (2016) found that close parental monitoring and advice

predicted lower odds of risky sexual behaviors among adolescents. Parental monitoring fosters adolescents' sexual development while providing acceptable discipline and setting limits of sexual behavior. A cross-sectional study in Ibadan, Nigeria, revealed that lower parental monitoring was associated with higher risky sexual behavior among high school students (Okhakhume, 2014).

The mesosystem of the socioecological model underscores the influence of membership of the adolescent in the existing social networks in the immediate community. For instance, adolescents who were more religious and frequently attended youth religious activities were less likely to engage in risky sexual behaviors (Lefkowitz et al., 2004, as cited in Haglund & Fehring, 2010). Moreover, the exposure of adolescents to some environmental factors, such as alcohol drinking, khat chewing, television entertainment, and social media, may increase their risk of engaging in risky sexual behavior. Hence, the micro level of the model explains the individual characteristics and face-to-face reciprocal interactions in specific settings. Similarly, a mesosystem explains the interrelation of individuals among various settings (Bronfenbrenner, 1974, as cited in McLeroy et al., 1988). My study specifically focused on the micro and meso levels of the socioecological model to examine the predictors of risky sexual behavior among adolescent high school students.

Therefore, the socioecological model was the appropriate choice to examine and explain the determinants of various levels of influences on students' risky sexual behavior. Some previous studies, though most conducted in developed countries, have been conducted to examine adolescents' risky sexual behavior using the framework of

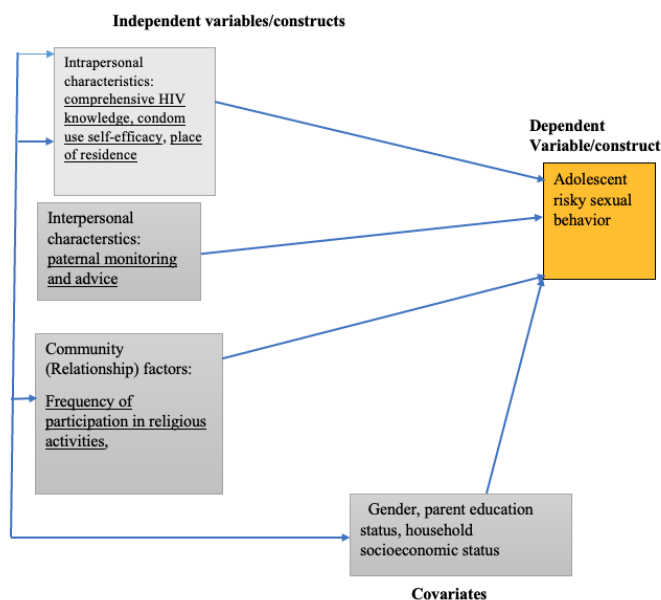
socioecological perspectives (DiClemente et al., 2005; Khuzwayo & Taylor, 2018; Latkin & Knowlton, 2005; Lee et al., 2014; Muchimba, 2019; Rizvi et al., 2020; Salazar et al., 2010). The research questions and hypotheses in this study build on this existing theory. I would expect the independent variables (HIV comprehensive knowledge, condom use self-efficacy, place of residence, parental monitoring, and frequency of participation in religious activities) to influence the dependent variable (unprotected sex) among high school students (Creswell, 2014).

Conceptual Framework

As Figure 1 illustrates, the conceptual framework shows the complex interactions of the broader determinants at different levels that influence adolescents' sexual behavior, as described in Bronfenbrenner's socioecological model. The conceptual framework provides insight into how particular constructs relate to one another. The framework clarifies the presumed association among variables and provides a roadmap to examine these associations (Dine et al., 2015; Rudestam & Newton, 2015). The conceptual framework is aligned with the problem statement, the theoretical framework, and the research questions.

Figure 1

Conceptual Framework Depicting the Hypothesized Relationship Between the Constructs of the Socioecological Model



Drawn from the socioecological model chosen for this study, the constructs in this conceptual model were used to examine the associations between the independent and dependent variables (Imenda, 2014). Moreover, the conceptual framework included key external variables that affect the association between the independent and dependent variables of interest. Dine et al. (2015) further noted that the conceptual framework includes key variables (covariates) that influence the hypothesized association between the independent and dependent variables.

Literature Review

HIV/AIDS Situation in Ethiopia

HIV is a viral disease that targets the immune system and weakens an individual's defense mechanism against various infections and cancers. The infected person develops

AIDS, the most advanced form of the disease. In 2-15 years, if untreated, AIDS manifests in the form of cancers, certain infections, and severe clinical illnesses (WHO, 2019).

HIV/AIDS does not have a vaccine nor cure to date. According to WHO (2019), at the end of 2018, HIV has claimed more than 32 million lives so far, and about 37.9 million people were living with the virus globally. Heterosexual contact is the dominant mode of HIV transmission in Ethiopia. The index cases of HIV and AIDS in Ethiopia were reported in 1984 and 1986, respectively (FMoH, 2005, as cited in Hladik et al., 2006).

Ethiopia, located in the horn of Africa, is one of the hardest-hit countries in Sub-Saharan Africa by the multiple impacts of HIV/AIDS in the past three decades. In Ethiopia, HIV/AIDS was reported during the civil war that ravaged the health systems and socioeconomic conditions of the country. The emergence of HIV/AIDS has further overwhelmed the health system and socioeconomic conditions of the country (FDRE, 1998; WHO, 2016). In 2003, the HIV prevalence reached an estimated 4,400/100,000 populations with a substantial geographic and gender disparity in the burden of the disease (WHO, 2016).

Access to essential sexual health services appears to be an important social determinant of HIV/AIDS among adolescents (Agaba et al., 2016). After toppling the fascist region in 1991, the government implemented 20 years of health sector development program (HSDP) in four series to strengthen the health system and improve the health outcomes of its citizens. The government action on accelerated expansion of primary health care facilities, training of mid-level human resources for health development, improved spending on health, and community empowerment initiatives in

the past two decades have remarkably contributed to access to and use of HIV/AIDS services across the country. For instance, the human resource for health density increased from 0.84 in 2008 to 1.3/1000 population in 2013, which could have improved the access and availability of essential HIV/AIDS services to the vulnerable population (FMoH, 2015).

Ethiopian Health System

The health service in Ethiopia is organized into three-tier systems at different administrative levels in the country: (a) primary level health care (health post, health center, and primary care hospital) at district level; (b) secondary level health care (General hospital) at zone level; and (c) tertiary level health care (specialized hospital) at regional state administrative levels of the country. A health center with five satellite health posts constitutes a primary health care unit (PHCU), which is the most accessible structure of the health system to the population at the grassroots level. Further, Ethiopia designed and implemented a health extension program (HEP), an essential package of health services implemented under PHCU, which focuses on disease prevention and health-promoting interventions at the household level in the rural areas of the country (FMoH, 2015). In this program, prevention and control of HIV and other sexually transmitted diseases (STIs) is one of the packages of basic health services delivered house to house and schools by the female health extension workers (HEWs).

As a mechanism to ensure the equitable distribution of population health outcomes across the populations in the country, HEP was effective in improving the health service utilization by empowering and linking the communities and primary health

care facilities (FMoH, 2015). More specifically, the HEP appeared to contribute to improving HIV knowledge and demand for testing in rural communities (Assefa et al., 2019; Seyoum et al., 2016). However, its effectiveness in empowering school adolescents' knowledge and skills in the areas of sexual and reproductive health has been limited (FHAPCO, 2018; FMoE, 2015).

Federal HIV/AIDS prevention and Control Office (FHAPCO), established in 2002, is mandated to coordinate and direct HIV/AIDS policy in Ethiopia. The office systematically engages all the sector offices and civic organizations for multidisciplinary HIV/AIDS response. It also coordinates resource mobilization from internal and external sources.

The efforts by the Ethiopian government to improve access to and use of basic health services, including HIV/AIDS, have yielded significant results in improving the population health outcomes in the past two decades. For instance, the life expectancy at birth improved from 45 years in 1997 to 65.5 in 2016, and morbidity, mortality, and disability from the major communicable diseases substantially declined in the past two decades (WHO, 2016; FMoH, 2015). After HIV/AIDS policy development and implementation of multiple and integrated interventions against the pandemic, the HIV prevalence declined from 3,300 per 100,000 in 2000 to 900 per 100,000 in 2016 among general populations (CSA & ICF, 2017; FHAPCO; 2018; Kibret, 2019); and from 12,400 per 100,000 in 2001 to 1,700 per 100,000 populations in the age group of 15-24 years in Ethiopia in 2014 (EPHI, 2015).

The decline in HIV/AIDS prevalence and mortality, however, was not accompanied by a similar decline of new HIV infections across different geographical regions and populations in the country (Assefa et al., 2019). For instance, in the southern national state of Ethiopia, there was an increase in HIV prevalence from 200 per 100,000 in 2005 to 400/100,000 populations in 2016 in the period (CSA, 2017). Moreover, there is evidence of increasing risky sexual behaviors among high school adolescents in urban areas in Ethiopia (Wana et al., 2019). The available evidence in the prevalence of risky sexual behaviors among high school students comes mostly from major cities of the country. Likewise, the 2016 EDHS results on HIV-related behavioral outcomes were reported in crude rates at the national and regional levels, which may not reflect the actual magnitude of the problem in the ethnically diverse populations with distinct cultural beliefs and norms in the southern region of the country.

Comprehensive HIV Knowledge

HIV knowledge and health literacy are closely linked. Health literacy has long been identified as one of the social determinants of health and health inequities across population groups. The 9th global conference on health promotion recognized health literacy as a bedrock to achieve the health-related SDG3 in 2030, as it appears to enable individuals to engage in health-promoting decisions and actions (WHO, 2017). The declaration envisages empowering individuals to develop knowledge and skills that enable them to address and tackle the determinants of their health. Steinberg (2005) argues that health literacy is a critical resource during adolescence as the knowledge and

skills gained during this period appear to determine their future health and wellbeing (as cited in Khajouei & Saleh, 2017).

A cross-sectional study that aimed to assess the health literacy level of high school students in Iran highlighted that only 29% of students had adequate health literacy (Khajouei & Saleh, 2017). Khajouei and Saleh (2017) also found an association between the level of health literacy and risky behaviors among high school students. Furthermore, Fleary et al. (2018), in their systematic review, found a strong association between health literacy and adolescent health behavior. Similarly, Park et al. (2017), in their cross-sectional and prospective study that examined the association between health literacy and health behaviors in New York City, found that the urban students with a lower level of health literacy were more likely to engage in risky sexual behavior. The findings underscore the need to strengthen school education to improve the knowledge of high school students to achieve better behavioral and health outcomes among urban students (Park et al., 2017). Additionally, Swenson et al. (2010) emphasized the role of health literacy in addressing the disproportionate HIV infections among African American adolescents as the HIV knowledge deficit was persistent among these groups. The findings underscore the importance of health literacy as a prerequisite to developing a comprehensive HIV knowledge that could protect adolescents from engaging in risky sexual behaviors.

HIV comprehensive knowledge is at the core of health literacy that could protect the youth from engaging in risky sexual practice. As a modifiable risk factor, improving comprehensive HIV knowledge has been targeted to curb the HIV pandemic among

adolescents. In 2001, United Nations, at its multilateral discussions, declared to achieve 95% of adolescents in the age group of 15-24 have the knowledge and skills that enable them to reduce their risk to HIV infection (UNGASS, 2002). Despite the recognition of HIV knowledge as an important protective factor against risky sexual behavior, the progress made has been unacceptably low to sustain the achievements gained in controlling the pandemic nationally and globally (UNAIDS, 2018). The fact is that lower HIV knowledge appears to influence adolescents to engage in risky sexual behaviors (Bartlett & Shelton, 2010, as cited in Collado et al., 2015).

The available evidence suggests that HIV risky behaviors among adolescents are increasing in Ethiopia. For instance, a cross-sectional study that included all pre-college schools in Adama city, in central Ethiopia, highlighted that 90% of students know about the mode of HIV transmission, and only 38.9% know that condom use can prevent HIV (Wana et al., 2019). Their study also revealed that 110(31.8%) students appear to engage in sexual activity while only 47.3% of them used condoms in their last sexual engagement before the survey (Wana et al., 2019). Similarly, only 37(33.3%) reported consistent use of condoms during sexual intercourse. Additionally, Kassa et al. (2016), in their cross-sectional study among Jiga high school students in Northern Ethiopia, reported that about 64% of students had comprehensive HIV knowledge, while 48 (16%) of them ever had sexual intercourse. Among those who ever had sex, 44 (83.3%) of high school students did not use condoms during their last sexual intercourse, respectively (Kassa et al., 2016). Furthermore, a cross-sectional study in 14 high schools in eastern Ethiopia reported that 677 (24.5%) of students had a comprehensive HIV knowledge

(Oljira et al., 2013). Thus, the studies indicated a lower level of comprehensive HIV knowledge contributing to risky sexual behavior among high school students in Ethiopia.

Different factors predicted risky sexual behaviors among high school students in the two studies in Ethiopia. Wana et al. (2019) identified age, peer pressure, substance use, and access to social media as significant predictors of risky sexual behavior in Adama city, Ethiopia. Similarly, lower comprehensive HIV knowledge, age, and drinking alcohol predicted risky sexual behavior among Jiga high school students in the Northern part of Ethiopia (Kassa et al., 2016). Besides a lower HIV protective knowledge among high school students in urban areas, the study also highlighted the importance of intrapersonal and environmental factors in increasing the vulnerability of high school students to engage in HIV-related risky sexual behaviors.

Moreover, the 2016 EDHS highlighted that only 1746 (39.6%) adolescent boys and 1492 (24.3%) of girls in the age group of 15-24 had comprehensive knowledge about HIV/AIDS at the national level (CSA & ICF, 2017). Similarly, in the southern region, only 849 (35.8%) boys and 516 (15.7%) of girls among the survey participants in the same age group had a comprehensive HIV knowledge (CSA & ICF, 2017). The urban-rural disparity of comprehensive knowledge among girls and boys appears to be unacceptably high. According to CSA (2017), only 19% and 37% of girls and boys in the age of 15-24, respectively from the rural area had a comprehensive HIV/AIDS knowledge. It appears that similar gender disparity was also observed in the engagement of risky sexual practice. For instance, from those who had sexual intercourse with a casual partner, 48% and 33% of girls and boys, respectively, did not use condoms during

their last sexual intercourse (CSA & ICF, 2017). The survey only reported gender as the determinant for risky sexual behavior for this particular age group.

In eastern and southern Africa, where the pandemic placed disproportional health and socioeconomic impact compared to other regions, the level of comprehensive knowledge about HIV/AIDS among adolescents remains very low. Awotidebe et al. (2014), in their cross-sectional survey in rural South Africa among high school students, found higher odds of consistent condom use among those with higher comprehensive HIV knowledge. The study also revealed that from those students who had sexual intercourse, 50 (46.7%) did not use condoms, and gender difference in condom use was not statistically significant (Awotidebe et al., 2014). Moreover, peer pressure and lower comprehensive HIV knowledge influenced their engagement in risky sexual practice (Awotidebe et al., 2014).

In addition, another cross-sectional study that aimed at identifying predictors of risky sexual behavior among high school students in Eastern Cape, South Africa, found that from those who reported sexual engagement in the previous 12 months, 155(72.8%) did not use condoms (Adeboye et al., 2016). In their study, living status, family closeness, and alcohol consumption were associated with risky sexual behavior, while higher HIV knowledge was not associated with risky sexual behavior (Adeboye et al., 2016). The other study that assessed the knowledge, attitude and practice (KAP) of HIV/AIDS among four high school students in the same province found that 40.3% of students had comprehensive HIV knowledge. Likewise, 58.1% and 68.4% of them ever had sexual intercourse and used condoms during their last sexual practice with a casual

partner, respectively (Adeboye et al., 2016). In their study, those with a higher comprehensive knowledge were about three times more likely to practice safer sex. However, age and gender did not appear to influence their comprehensive HIV knowledge (Adeboye et al., 2016). Ajide and Balogun (2018) in their study in Ibadan, Nigeria, reported similar findings that students with a higher comprehensive HIV knowledge have lower intention to engage in risky sexual behavior. Thus, a higher comprehensive HIV knowledge appears to help school adolescents engage in safer sexual practices. There is also mounting evidence of an association between increasing HIV comprehensive knowledge and a decline in HIV infection rates in areas characterized by high HIV prevalence (Oginni et al., 2017; UNAIDS, 2018).

Conversely, higher HIV knowledge may not always guarantee safer sexual practices among adolescents. Cross-sectional studies in Uganda, Cameroon, Nigeria, and Kenya found that adolescents appear to engage in risky sexual behavior despite having higher comprehensive HIV knowledge (Badru et al., 2020; Gonzalez et al., 2019; Nubed & Akoachere, 2016; Ochieng et al., 2011). For instance, in Cameroon, while they had higher comprehensive HIV knowledge, from those students who ever had sexual experience, 89(45.7%) of them did not use condoms in the last three sexual intercours before the survey (Nubed & Akoachere, 2016). These findings underscore the influence of other social drivers (social determinants of health) on the sexual behavior of adolescents to engage in risky sexual behaviors (Auerbach et al., 2011; Dean & Fenton, 2010, Khuzwayo & Taylor, 2018). The findings also indicate that individual behavior does not occur in a vacuum even though it appears to increase their vulnerability to

engage in risky sexual behavior and acquire the HIV infection (Dean & Penton, 2010; Small & Luster, 1994).

Condom Use Self-Efficacy

Self-efficacy refers to a person's judgment of his confidence or capability to perform a certain desired behavior (Bandura, 1995; Burrell et al., 2018). Lack of competence to perform a desired sexual behavior may be among the many factors that could account for an individual's vulnerability to engage in risky sexual behavior. Locke and Latham (1990) argued that perceived self-efficacy could empower individuals with a stronger commitment to engage in the desired behavior, even during difficult life circumstances (as cited in Bandura, 1995).

A considerable body of research had shown the association between perceived condom use self-efficacy and sexual behavior of adolescents concerning HIV/AIDS prevention and control (Bandura, 1995). Bogale et al. (2010), in their study that examined the psychosocial determinants of condom use among illiterate rural females in northwestern Ethiopia, noted that higher self-efficacy was associated with the actual use of condoms during their last sexual intercourse. Another cross-sectional study among high school students in western Ethiopia highlighted that higher self-efficacy was associated with the intention for consistent condom use among males (Girma et al., 2004). Nevertheless, according to Bandura (1995), females need to demonstrate higher self-efficacy than males to say no to unwanted sexual activity because of their increased vulnerability to risky sexual behavior and related health outcomes. In addition,

Gebreselassie et al. (2013) also reported higher self-efficacy associated with the intention for condom use among Grade 11 and 12 students.

Conversely, other studies reported an unprotective effect or indirect association of self-efficacy against risky sexual behavior. A cross-sectional study that assessed the predictors of risky sexual behaviors in Botswana found that higher self-efficacy was associated with risky sexual behavior of adolescents (Latemo & Mokgathe, 2013). Likewise, Louw et al. (2012), in their cross-sectional study in South Africa, revealed that higher perceived self-efficacy among male adolescents appears to predict the difficulty of getting condoms and coercive sex. For instance, the study in central South Africa found that higher self-efficacy among adolescents was negatively associated with risky sexual behaviors among adolescents (Abousselam et al., 2016).

Moreover, Gloppen et al. (2010), in their systematic review, noted that the direct protective effect of self-efficacy against risky sexual behavior was inconclusive. But self-efficacy appeared to mediate the effect of communication with peers about sex and negotiation about safer sex, which in turn, increased the intention for condom use among adolescents. Hence, the inconsistencies and methodological issues in previous studies highlight the need for the current study to bridge the knowledge gap in the literature. The fact is that the above studies used various scales of self-efficacy measurement, which could affect its observed predictive association with risky sexual behavior (Bandura, 1995; Forsyth & Carey, 1998). From the perspective of reducing the risk of HIV infection, though not the only factor, the self-efficacy of adolescents to say no for unsafe sex with the regular or casual partner remains critically important. The fact is that no

sexual intercourse without condoms appears to be safe as relationships during adolescence are often short and not with a single sexual partner (Rosenthal et al., 1991).

Place of Residence

The existing disparity in HIV/AIDS and sexual health-related behavioral outcomes across various regions of the world explicitly underscores the importance of the place of residence in shaping individual behavior and its outcomes. In the recent decades, there has been an increasing consensus that place of residence appears to be an important social determinant of health-related behaviors as it limits or exposes individuals to make unhealthy choices that include engaging in risky sexual behavior (Muchimba, 2019; Odimegwu & Somefun, 2017; Rew et al., 2011; Short & Mollborn, 2015). The fact is that the place of residence of individuals appears to create health in facilitating access to and utilization of services and health information through social and economic amenities (Arcury et al., 2005; Khuzwayo & Taylor, 2018).

The evidence in previous studies regarding the association between the place of residence and adolescents' sexual behavior found inconsistent. Berhan and Berhan (2015), in their systematic review and meta-analysis that examined the association between socioeconomic status and risky sexual behavior among male youth, asserted a significant association between urban residence and risky sexual behavior of youth in the age group of 15-24 years. In their study, condom use in the urban areas among male youth in the age group of 15-19 and 20-24 years ranged from 40% to 51%, respectively (Berhan & Berhan, 2015). Similarly, Wana et al. (2019), in their cross-sectional study, asserted a higher prevalence of risky sexual behaviors among high school students in

urban areas. However, this study had limitations as it did not include students from the rural area for the purpose of comparison. Further, while the 2016 Ethiopia demographic and health survey reported a notable variation in HIV prevalence among urban and rural population (2.9% versus 0.4%), respectively, it did not report the influence of place of residence specific to adolescents in the age group of 15-24 years (CSA, 2017).

Besides, a cross-sectional study among the youth in Vietnam asserted a significantly lower intention for condom use among urban residents compared to those from rural areas (Ngoc Do et al., 2020). Boyce et al. (2019), in their systematic review of determinants of infectious diseases in Sub-Saharan countries, found that a rapidly growing population, high population density, poverty, urban slums, rural-urban migration, and access to other substances may increase risky sexual behavior and HIV infections in urban areas.

Conversely, other studies reported higher risky sexual behavior among youth in rural areas compared to the urban ones. For instance, a cross-sectional study on the magnitude of risky sexual behaviors among high school students in Aman town of western Ethiopia highlighted that students from the rural area were about two times as likely to engage in risky sexual behaviors compared to the urban ones (Nigussie et al., 2020). From those students who reported risky sexual behavior, 76(71.7%) were from rural areas (Nigussie et al., 2020). Likewise, a similar research in two states of Nigeria (Benue and Ekiti, selected as high and low HIV prevalence states, respectively) revealed that a significantly higher number of youths from the rural areas of the states engaged in risky sexual behavior (Folayan et al., 2015). In the same study, it was found that more

women from rural areas of the states engaged in the transactional sex (Folayan et al., 2015).

Additionally, a cross-sectional study in Eastern Cape of South Africa among Grade 11 students in two rural settings reported a significantly higher prevalence of risky sexual behavior among rural students (Wild et al., 2010). In this study, adolescents from rural areas were more likely to initiate sex earlier and were less likely to consistently use condoms compared to those in the urban area (Wild et al., 2010). Likewise, Kangmennaang et al. (2019), in their analysis of multiple indicator surveys conducted in Ghana, Central African Republic, and Eswatini, found that adolescents from the rural settings had significantly higher odds of inconsistent condom use compared to their urban counterparts.

As part of the global efforts to end the HIV pandemic by 2030, the current HIV prevention interventions in the national road map 2018-2020, Ethiopia, prioritized protecting adolescents (FHAPCO, 2018). However, the school programs remain limited in scope, lack life skills-based sexuality education, and access to essential services, including access to condoms (FHAPCO, 2018). Given the demographic context of Ethiopia, where the majority of the population resides in the rural part of the country, the increasing risky sexual behavior among the sexually active group of the population in rural areas signifies a serious public health concern. Unless the interventions are reoriented to the rural areas, the increase in risky sexual behavior may contribute to the resurgence of the HIV incidence in the country. Wild et al. (2010) highlighted the

importance of interventions against HIV/AIDS that reduce risky sexual behaviors among youth in rural settings.

Moreover, the major focus of the current interventions in Ethiopia appears to be at most at-risk populations (MARPs) in hot spot geographic areas with a high prevalence of HIV/AIDS to reduce new infections (FHAPCO, 2018). Unless the program reorients and reinvigorates interventions for adolescents in the schools, the increasing trend of risky sexual behaviors in these population groups may place a substantial challenge in ending the pandemic by 2030. The evidence from previous studies that evaluated the school-based HIV prevention interventions in the United States and Sub-Saharan countries highlighted that the programs were effective in improving HIV knowledge, delaying sexual initiation, and improving self-efficacy skills of refusal or condom use (Fonner et al., 2014; Kirby et al., 1994; Ma et al., 2014).

According to the Federal Democratic Republic of Ethiopia Ministry of Education (FMoE, 2015), the secondary school enrolment rate has grown fivefold in the last two decades with an immense achievement in narrowing the gender parity index from 0.80 and 0.46 in 2009/10 to 0.94 and 0.85 in 2013/14. Such a growth rate in enrolment presents both an opportunity and a challenge for HIV control and prevention. However, the education sector development program V, in its road map 2015/16-2019/20, did not outline any clear strategy to reverse the growing risky sexual behavior to reduce HIV infection among the school adolescents. It appears that strengthening school-based sexual education could be a feasible and effective strategy to reaching adolescents from the rural areas with the potential positive spillover effects (externalities) for out-of-school

adolescents and the community at large (Benjamin-Chung et al., 2017; Heywood et al., 2004).

Parental Monitoring

The interpersonal characteristics in the socioecological model represent the immediate family environments, including adolescent-parent relationships, parental monitoring, and the socioeconomic variables of the family that directly and indirectly influence the adolescent sexual behavior. The family remains the foundation of adolescent development as parents play a magnificent role in shaping the behavior, health, and social outcomes of their children. Many scholars agree that positive parenting plays a remarkable impact in the developmental paths of the adolescents (Kim-Spoon et al., 2012; Voisin et al., 2017; Whittle et al., 2014). Moreover, the adolescence period appears a critical time to learn pro-social behaviors, which are primarily shaped by the parents. Merilena (2015) contends that adolescent unhealthy behaviors primarily represent an unsuitable family environment. The fact is that parents form the adolescent personality to shape and prepare them as a responsible future adult. In addition, while parents and peers appear to influence both risky and protective behavioral outcomes among adolescents, parents remain to play a central role in reinforcing behavioral development that is protective against risky sexual behaviors and associated health risks (Wang et al., 2015).

Adolescence is a period where rapid biological and psychosocial changes take place. The change during this period may be characterized by increased decision making, experimentation, and pressure from parents and peers to behave in a particular way.

These changes could often result in conflicts and place a notable challenge in the smooth parent-adolescent relationship. Branje (2018) argued that conflicts that arise during adolescence due to rapid biological and psychosocial changes could help a parent-adolescent relationship to adapt more reciprocal and egalitarian relationships to engage diverging views and to manage a range of emotions flexibly. Such kind of interdependent and more equal parent-adolescent relationship could result in adolescence with higher emotional regulation skills, increased self-esteem, autonomous decision making, self-confidence, improved communication skills, and reduced problem behaviors (Branje, 2018; Kobak et al., 2017). The findings highlight the salient impact of positive parent-adolescent relationships in the health and behavioral outcomes of adolescents as it facilitates the transmission of positive sexual values and social skills to their adolescents (Buhi & Goodson, 2007, as cited in Suwarni et al., 2015; Davila et al., 2017; Sidze & Defo, 2013).

However, the parents should appear as role models for the anticipated pro-social behavior from their adolescents, including sexual behavior. The parents' behavior, attitude, and values as role models could dictate the behavior of adolescents because of their prolonged exposure to their parents (Coleman & Hendry, 1990, as cited in Hurd et al., 2009). The parents not only monitor their adolescents but also demonstrate positive relationships, take accountability for their mistakes, and have respect for others.

More specifically, parents need to set a role model to their adolescents in avoiding any extramarital sexual relationship, which in turn, could shape the sexual behavior of adolescents in their later age. The fact is that adolescents form the desired behavior

through observation from their significant others, primarily their parents. The monitoring and emotional support provided to the adolescents may be effective when the parents can build a constructive relationship and showcase as role models to their adolescents (Okigbo et al., 2015; Oluyemi et al., 2017). Therefore, supportive, exemplary discipline, and egalitarian relationships underscore the important foundation in increasing the effectiveness of parental monitoring of adolescents and reduce their exposure to risky sexual behavior.

Several research findings in the previous studies support the positive impact of parental monitoring on the sexual health and behavioral outcomes of youth (Keijsers et al., 2016; Mahat et al., 2016; Tuason et al., 2017). However, only a few empirical studies tested this association in Ethiopia. For instance, in the cross-sectional study among high school students in northeast Ethiopia indicated a significant association of positive and authoritative parent-adolescent relationships with lower odds of risky sexual behavior (Yimer & Ashebir, 2019). In the same study, it appears that there was an increased odds of risky sexual behavior of adolescents when the parents' knowledge was poor about where and with whom the students spend their time outside the home (Yimer & Ashebir, 2019). Likewise, a cross-sectional study in Gondor city, in northwestern Ethiopia, revealed that students who reported perceived absence of parental monitoring were about 12 times as likely to engage in risky sexual behaviors (Kasahun et al., 2017). The authors suggested engaging all stakeholders, including parents, the health system, policymakers, and schools, to improve the sexual health of adolescents in high schools.

Further, previous studies suggested the salient impact of transparent parent-adolescent communication and monitoring on sexual matters and its implications to improve their sexual health. In their cross-sectional study in northwest Nigeria, Oluyemi et al. (2017) noted that parent communication and monitoring appear to predict lower odds of risky sexual behavior among high school students. Likewise, cross-sectional studies among African American high school students in a resource-poor urban setting in Chicago (the United States) and Mexico found high parental monitoring and communication to decrease the odds of behavioral health risks, including risky sexual behavior (Davila et al., 2017; Voisin et al., 2017). Similarly, a longitudinal study among high school students highlighted increasing risky sexual behaviors with lower parental monitoring (Wang et al., 2015).

Moreover, Dittus et al. (2015), in their meta-analysis of risky sexual behaviors among adolescents in northern America and western European countries, revealed that higher parental monitoring was associated with delayed initiation of sex and increased condom use. Though most studies in this meta-analysis were cross-sectional and the pooled effect size was small, the authors suggested strengthening provider-initiated parental monitoring activities to enhance the sexual and reproductive health of adolescents (Dittus et al., 2015). Therefore, some cross-sectional studies (Crosby et al., 2015; Kasahun et al., 2017; Yimer & Ashebir, 2019), longitudinal study (Wang et al., 2015), and meta-analysis (Dittus et al., 2015) highlighted that high parental monitoring was associated with decreased odds of risky sexual behavior among adolescents.

Nevertheless, other studies reported adolescent-related characteristics (gender and information disclosure to parents) and community factors affecting the effectiveness of parental monitoring, underscoring the salient reciprocal influence of social determinants of health. For instance, a cross-sectional study conducted among black African youth in South Africa reported that effective parental monitoring was associated with neighborhood quality and maternal social support, which in turn, predicted decreased risky sexual behavior of youth (Goodrum et al., 2017). Though the study provided important insight into the reciprocal influence of community factors on parental monitoring, it may lack external validity because of a small sample of adolescents participated in the study. Likewise, the gender of adolescent and parent and adolescent disclosure of information appear to influence the effectiveness of parental monitoring. Traditionally, parental monitoring appears to be stronger on girls than boys because of their vulnerability to multiple health-related risks (Davila et al., 2017). In their cross-sectional study in the United States, Villarreal & Nelson (2018) found that girls with less maternal monitoring were more likely to experience risky sexual behaviors of higher internalizing symptoms influencing disclosure of information to their parents. In addition, a Mexican study among high school students also reported higher parental monitoring among females and more sexual communication with males associated with decreased risky sexual behavior (Davila et al., 2017).

The study findings highlight unique and context-specific approaches to build the knowledge and skills of parents to monitor adolescents and improve their sexual health. However, the findings of these studies need to be interpreted cautiously as most of the

studies were conducted in developed countries where the measurement and the context of sexual behavior may be different from the African context. While parental monitoring appears to influence the adolescent risky sexual behaviors positively, less research has been conducted in Ethiopia in general and in the southern region in particular.

External Religious Practice

As described earlier, behavior, from socioecological perspective, is influenced by the reciprocal and multiple levels of determinants in the social context. The principles of religion are often embedded in the culture and norms of a particular society, and it affects the behavior of individuals in subtle ways (Mathur, 2012). According to Haglund and Fehring (2010), group membership and religious teachings in religious practices require members to adhere and endorse religious attitudes on sexual morality. Those religious teachings and group norms in the social network are believed to offer an increased level of social support (Haglund & Fehring, 2010), and reinforce social control measures on adolescent sexuality and risky sexual behaviors (Osafo et al., 2014).

Religion has multiple dimensions that are rooted in the theories of religion that emerged in the early 1900s. According to Wach (1994), religion could be categorized into three major dimensions that include (a) theoretical, which refers the doctrinal adherence; (b) cultic, which refers to one's level of devotional practice and worship; and (c) sociological, which refers to the social involvement in religious fellowship activities (as cited in Pearce et al., 2017). Pearce et al. (2017), for measurement purpose, further classified religion into five dimensions that included religious beliefs, religious exclusivity, external practice, personal practice, and religious salience. I focused on the

sociological aspect (external practice), which emphasizes the social involvement in religious practices, group membership, attendance of religious services, and its benefit on the health and sexual behaviors of adolescents.

The external religious practice appears to influence the adolescent sexual practice through social support benefits from group membership and practice in the religious community network (Pearce et al., 2017). The group members in the network provide reciprocal social support resources (emotional, informational, instrumental, appraisal, and companionship), which in turn, enhance self-esteem, social skill, and self-efficacy of adolescents to cope with life challenges (Agbaria et al., 2017; Rostosky et al., 2004; Williams et al., 2004). Rostosky et al. (2004) added that the social integration of adolescents with low-risk peers in the religious community might serve to bolster the prosocial sexual behaviors and reduce their vulnerability to related problems.

Additionally, the research evidence from South Africa suggests that 60% of adolescents discussed sexual matters with their social ties (Harling et al., 2018). Asrese and Mekonnen (2018), in their study of social network correlates of risky sexual behaviors among high school adolescents, highlighted that the discussion about sexual issues among increasing network size was protective against risky sexual behaviors. Therefore, besides to reinforcing sexual morality that focuses on abstinence, adolescents' regular participation in religious activities could provide increasing social support that could protect them from risky sexual behaviors (Agbaria et al., 2017; Cerqueira-Santos & Koller, 2016; Haglund & Fehring, 2010; Manlove et al., 2008; Tuason et al., 2017).

In Ethiopia, few studies have examined the protective effect of religiosity (external religious practice) against risky sexual practice among adolescents. Cross-sectional studies that were conducted among high school students in western and northeast Ethiopia highlighted that frequent participation in religious activities resulted in reduced risky sexual behaviors compared to non-regular participants (Kassahun et al., 2019; Tolera et al., 2019). Moreover, high school students who were not regularly attending religious activities were three times as likely to initiate sexual activity at their early age (Kassahun et al., 2019). The other study in the North Shewa zone, Oromia regional state of Ethiopia, revealed that adolescents who had higher religious connectedness were more likely to have a single sexual partner with consistent condom use (Handebo et al., 2018). However, in this study, religiosity (external practice) was measured with the other four dimensions of religion, and the summary result was categorized into high and low religious connectedness. Therefore, it is difficult to conclude the separate influence of the external religious practice on the risky sexual behaviors in this particular study.

Another cross-sectional study among adolescents in the Lagos state of Nigeria found that participation in religious activities predicted lower odds of casual sex without condoms among males (Wusu, 2011). In the same study, adolescent girls who regularly attended religious activities were more likely to engage in unprotected sex and have more than one sexual partner (Wusu, 2011). This study finding highlighted the differential impact of gender and the increased vulnerability of adolescent girls even in the social networks that appeared to be protective against risky sexual behaviors for adolescent

males. Ugoji (2014), in their cross-sectional study among high school students in Delta State, Nigeria, reported that frequent participation in religious activities was protective against risky sexual behaviors. A longitudinal study among high school adolescents in rural settings in the south-central area in the United States revealed that those who engaged in risky sexual behaviors had significantly lower participation in religious activities (Rew et al., 2011).

Nevertheless, the other cross-sectional study that examined the role of external religious practice among high school students in seven states of Brazil revealed no difference in frequency of participation in religious activity and risky sexual behavior among the group that already initiated sexual intercourse (Cerqueira-Santos & Koller, 2016). In the same study, however, external religious practice was associated with the lower odds of sexual debut among high school students (Cerqueira-Santos & Koller, 2016). In summary, more of the studies related to external religious practice and adolescent sexual behavior elsewhere showed its protective effect against risky behaviors, including risky sexual behavior. The authors suggested the implications of engaging religious institutions to reduce the increasing rates of risky sexual behaviors and related health problems among adolescents (Handebo et al., 2018; Kassahun et al., 2019; Tolera et al., 2019; Rew et al., 2011; Ugoji, 2014; Wusu, 2011). In the southern regional state of Ethiopia, where there exist 55 ethnic groups with their distinct cultural values and beliefs, studies that examined the influence of the external religious practice on the risky sexual behavior of adolescents are not available which highlighted the knowledge gap in the literature to conduct this study.

Demographic Variables

In the previous literature, gender and socioeconomic status of parents (educational status and wealth index) were identified as potential confounding factors in the association between other independent variables and risky sexual behavior.

Gender

The impact of HIV appears to be heterogeneous across different demographic factors, including gender. In Ethiopia, in 2016, adolescent women in the age group of 15-24 account for 57.5% of the prevalent cases and 68% of HIV new infections (Girum et al., 2018). In the same year, new HIV infections among adolescent girls in the age group of 15-24 were 44% higher compared to their male counterparts (Girum et al., 2018; UNAIDS; 2017). Previous studies reported persistent gender disparity in the factors that increase the vulnerability of adolescents to engage in risky sexual behaviors in Ethiopia. For instance, adolescent females were more likely to have lower comprehensive HIV knowledge compared to their male counterparts (CSA & ICF, 2017).

Moreover, in their study that examined gender and risky sexual behavior among youth in Nigeria, Odimegwu & Somefun (2017) found that only 16% of females used condoms in their last sexual intercourse compared to 43% of males. The fact is that the persistent gender inequality and power imbalances in the sexual relationship appear to influence female adolescents and make them more vulnerable to engage in risky sexual behaviors and its negative health outcomes including HIV infections (Haberland, 2015). The prevailing cultural beliefs about gender roles and their socioeconomic position appear to notably influence their access to information and reproductive health services,

which in turn, increases their vulnerability to risky sexual behavior and HIV infection (Haberland, 2015; Moore, 2006, as cited in Letamo, 2011).

Additionally, previous studies have highlighted gender variations in the protective role and effectiveness of parental monitoring and religiosity (external religious practice) against risky sexual practices of adolescents. For instance, Villarreal and Nelson (2018) noted a gender variation in lower maternal monitoring where more female adolescents engaged in risky sexual behaviors compared to their male counterparts. Likewise, in the four waves of longitudinal study among the Bahamas high school students between 2008/9 and 2011, it appeared that lower odds of risky sexual behaviors for male adolescents were associated with higher parental monitoring. While only perceived peer influence predicted higher odds of risky sexual practice among female counterparts (Wang et al., 2015). A cross-sectional study among adolescents in Lagos, Nigeria, highlighted that frequent participation in religious activity among females was associated with unprotected sex and having multiple sexual partners (Wusu, 2011). However, Rostosky et al. (2004), in their review of longitudinal studies on the impact of religiosity and risky sexual behavior, noted that frequent participation in religious activity was associated with delaying sexual debut among adolescent females. Ostensibly, HIV new infections appear to disproportionately affect adolescent girls and are gendered for various cultural, social, economic reasons in Africa (Kangmennaang et al., 2019). According to Haberland (2015), sexual health programs that addressed gender issues effectively reduced HIV infections and related problems among adolescents.

Parental Socioeconomic Status

The parental socioeconomic status includes the parent educational attainment and household wealth index variables. The socioeconomic status of the adolescent family has been identified as a significant determinant of risky sexual behavior among adolescents in previous studies. But the findings appeared to be inconclusive in different countries. For instance, a comparative cross-sectional study among users and non-users of youth reproductive health service in Ethiopia found that family income was not associated with youth risky sexual behavior after fitted in the multivariate logistic regression model (Fetene & Mekonnen, 2018). In the study conducted among high school students in two rural settings in South Africa, higher family socioeconomic status was associated with increased risky sexual behaviors among males but with lower odds of risky sexual behavior among females (Wild et al., 2010). Likewise, analysis of multiple indicator survey in Ghana, Central African Republic, and Eswatini revealed that risky sexual behavior was associated with lower socioeconomic status among adolescent females across the three countries (Kangmennaang et al., 2019).

Conversely, Isiugo-Abanihe and Oyediran (2004), in their study that analyzed Nigeria DHS only for adolescent females in the age group of 15-24 highlighted that those from the family of higher socioeconomic status were more likely to use condoms compared to those from lower socioeconomic class (20% versus 12.8%), respectively. Additionally, the study among the United States adolescents reported that adolescent females from college-level educated families had higher odds of using condoms during their last intercourse compared to those from non-educated ones (Santelli et al., 2000). A

meta-analysis conducted from studies carried out in 26 developing countries on risky sexual behaviors among male youth revealed that those from higher socioeconomic status had higher odds of engaging in risky sexual behavior (Berhan & Berhan, 2015). The finding contradicts the previous studies that identified poverty as a primary social determinant of risky sexual behavior and HIV infection in developing countries, warranting further research (Magadi, 2016).

Summary and Conclusions

Evidence from the recent studies suggests that HIV new infections and risky sexual behavior among adolescents are on the rise in Ethiopia. However, the available evidence on the predictors of HIV-related risky sexual behaviors among high school adolescents is mostly limited to the major cities in Ethiopia. More specifically, the national survey reports on the HIV prevalence and related behavioral outcomes among adolescents in the age group of 15-24 were in crude rates. The crude rates of HIV-related behavioral outcomes may not reflect the real magnitude of the problem in the southern regional state of Ethiopia. The fact is that the diverse ethnic groups with their distinct cultural values and beliefs in the region could have varying access to and utilization of HIV/AIDS prevention and control services. Moreover, the recent EDHS reported an increase in HIV new infections in the southern regional state despite its decline at the national level in Ethiopia. In addition, there is a paucity in the literature in parental and religious factors and their association with risky sexual behavior of adolescents in the area selected for this study.

The purpose of this study was to examine the association between a set of independent variables, including personal (comprehensive HIV knowledge, condom use self-efficacy, and place of residence), parental (parental monitoring and communication), religious (frequency of participation in religious activities) and the outcome of risky sexual behaviors among a sample of high school students at Angacha rural district in southern Ethiopia. The literature review, which included cross-sectional and longitudinal studies, was conducted on the main constructs of this study to understand the available evidence and the existing knowledge gap in the field. The evidence from this research contributes to bridging the knowledge gap in the literature and help decision-makers design effective interventions to strengthen the control of the HIV pandemic and enhance the social change effect in the study area.

Comprehensive HIV knowledge is of paramount importance for adolescents to understand its mode of transmission and take the needed healthy actions. The evidence from the current literature suggests a lower level of comprehensive HIV knowledge as one of the predictors of risky sexual behaviors among adolescents. Likewise, there exists gender and geographic disparity in the level of comprehensive knowledge among adolescents, which in turn, increased their vulnerability to engage in risky sexual behaviors. However, higher HIV knowledge may not always guarantee safer sexual practices among adolescents highlighting the salient influence of other social-ecological factors in risky sexual behaviors.

Moreover, the available evidence on condom use self-efficacy and risky sexual behavior of adolescents suggests that higher self-efficacy predicted the actual use of

condoms among males and intention to use condoms among female adolescents.

Nevertheless, the available evidence in the association between condom use self-efficacy and risky sexual behaviors appears to be inconclusive which may be because of methodological differences and other socioecological influences.

Further, the place of residence remains one of the salient determinants of HIV-related behavioral outcomes among adolescents particularly in resource-poor settings. The available evidence in western part of Ethiopia and other African countries suggests that adolescents from rural areas appear to engage more in risky sexual behaviors compared to urban ones highlighting the need to reorient HIV services to reach the rural adolescents in the demographic context of these countries.

In addition, several research findings in the previous studies support the positive impact of parental monitoring on the sexual health and behavioral outcomes of youth. Longitudinal studies among high school students highlighted increasing risky sexual behaviors with lower parental monitoring. However, only a few studies examined the protective effect of parental monitoring against risky sexual behaviors among adolescents in Ethiopia implying the need for this study.

The external religious practice (participation in religious activities) appears to influence the adolescent sexual practice through social support benefits from group membership and practice in the religious community network. In the previous studies, frequent participation of adolescents in the religious activities predicted delayed sexual initiation or lower odds of unprotected sexual intercourse. However, a gender difference in its protective effect was also reported. In the southern region of Ethiopia, studies that

examined the influence of the external practice on the risky sexual behavior of adolescents are not available which highlighted the knowledge gap in the literature to conduct this study.

In this study, I used a socioecological model as a theoretical framework. The theory posits that behavior is affected by the interaction between the characteristics of the individual, the community, and the environment (Bronfenbrenner, 1994). The model explains the determinants of health behavior or risk factors at three levels: Micro, meso, and macro levels. The micro-level of the model represents the intrapersonal and interpersonal factors while the meso level informs about the community factors that influence the individual behavior (Bronfenbrenner, 1994). The socioecological model recognizes the multiple social and environmental influences and social determinants of health that shape individual behavior.

This study employed a quantitative approach using a cross-sectional study design to answer the research questions. Using the quantitative approach, I examined the association between the independent variables (comprehensive HIV knowledge, condom use self-efficacy, place of residence, parental monitoring, and frequency of participation in religious activities) and the dependent variable, risky sexual behavior. A sample of 403 students were selected using a stratified random sampling technique from Angacha high school students. After collecting the data using a self-administered questionnaire, descriptive and inferential (bivariate and multivariate) statistical analysis was conducted using SPSS to answer the research questions.

One of the limitations is that cross-sectional studies cannot be used to infer causality because of the difficulty of determining the temporal sequence between the risk factors and the outcome (Sedgwick, 2014; Szklo & Nieto, 2014). Hence, an attempt to infer the observed association between the independent and dependent variables of the study could lead to a temporal bias (Szklo & Nieto, 2014). Moreover, the fact that premarital sex is not a socially desirable behavior in many cultures, the respondents of this study may hide their experience of exposure to a risky sexual behavior leading to a social desirability response bias (Krosnick & Presser, 2009). The non-disclosure of their sexual experience by adolescents could result in a lower prevalence of risky sexual behavior which may not reflect the actual situation in the study area. Nederhof (1985) contends that the use of self-administered questionnaires could reduce the effects of social desirability bias.

Chapter 3 presents detail descriptions about the research methodology, research questions/hypotheses, research setting and participants, sample size and participant selection procedures, instrumentation, data collection, and data analysis plan.

Chapter 3: Research Method

Introduction

The purpose of this study was to examine the association between a set of independent variables, including personal (comprehensive HIV knowledge, condom use self-efficacy, and place of residence), parental (parental monitoring and communication), and religious (frequency of participation in religious activities) factors and the outcome of risky sexual behaviors among a sample of high school students at Angacha rural district in southern Ethiopia. Primary data from high school students was collected on the broader risk factors and outcome variables to examine suggested associations (Creswell, 2014). The examination of the broader determinants of risky sexual behavior among high school students provides important evidence to decision makers for designing effective interventions that protect the youth from HIV in the underserved and predominately rural area of southern Ethiopia, leading to positive social change. In Chapter 3, I present detailed descriptions of the research methodology, research questions/hypotheses, research setting and participants, sample size and participant selection procedures, instrumentation, data collection, and data analysis plan.

The following were the research questions and hypotheses for this study.

RQ1: Is there an association between comprehensive HIV knowledge and the sexual behavior of the student?

H01: There is no statistically significant association between comprehensive HIV knowledge and sexual behavior of the student.

Ha1: There is a statistically significant association between comprehensive HIV knowledge and the sexual behavior of the student.

RQ2: Is there an association between condom use self-efficacy and the sexual behavior of the student?

H02: There is no statistically significant association between condom use self-efficacy and the sexual behavior of the student.

H02: There is a statistically significant association between condom use self-efficacy and the sexual behavior of the student.

RQ3: Is there an association between the place of residence and the sexual behavior of the student?

H03: There is no statistically significant association between the place of residence (urban vs. rural) and the sexual behavior of the student.

Ha3: There is a statistically significant association between the place of residence and the sexual behavior of the student.

RQ4: is there an association between parental monitoring and the sexual behavior of the student?

H04: There is no statistically significant association between parental monitoring and the sexual behavior of the student.

Ha4: There is a statistically significant association between parental monitoring and the sexual behavior of the student.

RQ5: Is there an association between the frequency of participation in religious activity and the sexual behavior of the student?

H05: There is no statistically significant association between the frequency of participation in religious activities and the sexual behavior of the student.

Ha5: There is a statistically significant association between the frequency of participation in religious activities and the sexual behavior of the student.

Research Design and Rationale

In this study, I employed a quantitative approach using a cross-sectional study design to answer the research questions. Using the quantitative approach, I examined the association between the independent variables (comprehensive HIV knowledge, condom use self-efficacy, place of residence, parental monitoring, and frequency of participation in religious activities) and the dependent variable, risky sexual behavior. Quantitative research methods can help study and explain social phenomena with scientific objectivity by deriving knowledge from logical predictions based on direct observation (Babbie, 2011; Rudestam & Newton, 2015). Moreover, the selection of the quantitative approach was informed by the purpose and research questions of this study to align its components (Nishishiba et al., 2014).

The ontological approach in quantitative research entails a philosophical assumption about the nature of social reality that emerges from objective findings of social phenomenon (Babbie, 2011). From an ontological perspective, the quantitative approach in epidemiological studies appears to be grounded on objectivity and postpositivist assumptions (Babbie, 2011; Creswell, 2014). The assumption in quantitative method of research depends on a systematic investigation of quantifiable data to measure an association between independent and dependent variables and test

hypotheses in response to research questions of interest (Bryman, 2012; Creswell, 2014; McCusker & Gunaydin, 2015). This deductive approach is used to objectively examine theoretically expected patterns between variables using quantifiable data (Babbie, 2011; Creswell, 2014).

Moreover, the collection and analysis of quantifiable data using standard scientific research procedures could lead to a valid generalization and replication of the study in different settings to advance knowledge in the discipline (Bryman, 2012; Creswell, 2014). Likewise, the detachment of the researcher from the subject matter in the quantitative approach helps maintain the objectivity and improve the anonymity of the respondents (Bryman, 2012; McCusker & Gunaydin, 2015). Further, the scores from measurement instruments used to gather objective data could help make valid interpretations and conclusions from the study results to draw inferences to the population (Bryman, 2012; Creswell, 2014).

The cross-sectional design helps measure the risk and outcome variables at the same time and provides the prevalence estimate of risky sexual behaviors among the study population (Sedgwick, 2014). Moreover, the cross-sectional design helps measure variations among study populations from the data collected at a single point in time (Bryman, 2014; Sedgwick, 2014). This design also helps to examine patterns of association between variables and provides a researcher with a consistent benchmark to compare the findings with other studies. Nevertheless, the cross-sectional design provides no information for causal inferences as the simultaneously collected data cannot show the temporal sequence of the events under study (Creswell, 2014; Fink, 2013; Sedgwick,

2014). Thus, the results only show the association between the independent and outcome (risky sexual behavior) in this study.

Furthermore, the use of a cross-sectional study design was appropriate with the available time and resources to conduct the study. Collecting a large amount of data about the exposure and outcome of the interest from a sample of the study population at a single point in time is faster and cheaper (Forthofer et al., 2007). Likewise, the cross-sectional design provides useful epidemiological information on the prevalence of risky sexual behavior among high school students within a shorter time compared to other designs (Setia, 2016). Therefore, the selected research design is appropriate to examine the hypothesized association between the study variables in this study.

Methodology

Study Setting and Population

The study population were high school students in Angacha district in the southern regional state of Ethiopia. The southern regional state is one of the federal states that constitutes southern, south-central, and southwestern parts of the country. Kembata is one of the ethnic groups in the region with an estimated 1.2 million populations located in the south-central part of the region. According to CSA (2010), 18.5% of the populations in Kembata live in an urban area, which is lower than the national average of 21.7%. The area is characterized by a high population density of 502 persons per km². The Kembata administrative area is a poorly developed and underserved area in the region, characterized by poor road networks and telecommunication facilities. The poor access to and use of these communication facilities may affect the health and behavioral outcomes

of the populations in general and adolescents in particular (Bauerly et al., 2019). Due to high unemployment and lack of job opportunities in the area, the youth appear to migrate mainly to the Republic of South Africa, illegally crossing several risky transnational borders looking for better opportunities (Adugna, 2019).

Angacha is one of the districts under the Kembata zone administration. Its capital city, Angacha, is located about 245 kilometers from Addis Abeba, the capital of Ethiopia. The district has an estimated population of 160,000 in 2020, which is predominantly protestant Christian and agrarian society. Despite recent government interventions on expansion of primary health care facilities, the modern health service use rate still remains low (FMoH, 2015). The target population for this study was high school students from Grades 9–12 in Angacha district. The target population at the time of data collection was 2,530, of which 33% were female students.

Sampling and Sampling Procedures

In this study, I employed a stratified random probability sampling technique to select the study samples among high school students. In stratified random probability sampling, the chances of selection are known for each strata and study unit, which provides the basis for the statistical inference from the sample to the study population (Creswell, 2014; Fowler, 2009). After determining the total sample size, it was stratified into the male and female population in the same proportion as they appear in the entire study population. According to Creswell (2014), proportional stratification of the sample, based on male and female students, ensures their representation.

One important step in epidemiological studies is determining the appropriate sample size for a particular study. Consideration of an adequate sample size appears to reduce the sampling error and help the study yield reliable information (Fowler, 2009; Hajian-Tilaki, 2011). Moreover, a larger sample size enables the study to have a greater precision to yield a real and meaningful difference (effect size) due to the influence of the independent variable on the outcome variable (Hajian-Tilaki, 2011; Smith, 2018; Sullivan & Feinn, 2012). Besides reducing the measurement error, a larger sample size is a strategy to increase the power of the study (Sullivan & Feinn, 2012).

Inclusion and Exclusion Criteria

All high school students who were currently in Grades 9 to 12 were included in the study. The following were the exclusion criteria for the adolescents in the sample: (a) married students; (b) students in grades below Grade 9 and above Grade 12; (c) out of school students; (d) students with visual impairment; (e) students with reported mental illness; and (f) students who were ill and could not respond to the self-administered questionnaire. The final sample size was determined based on the following considerations: (a) risky sexual behavior prevalence rate of 50%; (b) 95% confidence interval; and (c) 5% margin of error or 95% statistical power, which is related with the data analysis plan of the study (Creswell, 2014). Accordingly, the calculated sample size for this study was as follows:

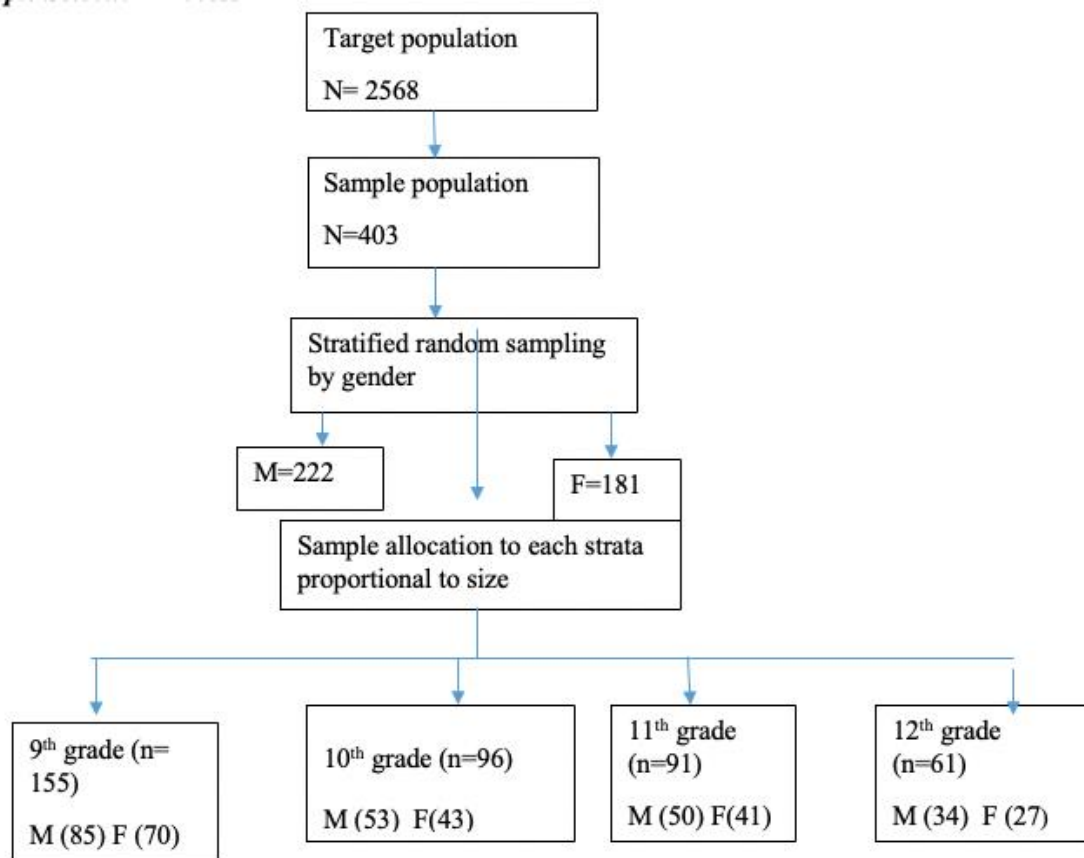
$$n = \frac{(z\alpha/2)^2 p (1 - p)}{d^2}$$

$$n = \frac{(1.96)^2 0.50 (1 - 0.50)}{(0.05)^2}$$

$$n = 384$$

I further calculated the sample size using Epi-Info Version 7.2 and OpenEPI, considering (a) student population of 1,908; (b) expected frequency of 50%; (c) 5% margin of error; and (d) design effect of 1.0 (CDC, n.d.; Dean et al., 2013). I considered the final sample size of 403 after adding 5% of the sample to compensate for possible nonresponse rate. Adding a given number of cases to the sample reduces a sampling error and improves the internal validity of the study findings (Fowler, 2009; Kelly et al., 2003). Likewise, the statistical power of 95% increases the chance of detecting the real effect size in the association between the exposure and an outcome of risky sexual behavior of students (Greenland et al., 2016).

Furthermore, the above sample was allocated proportionally to male and female students in the school to make the study more representative of the target population (Creswell, 2014; Larsen, 2008). Accordingly, 155 (44.7%) of the sample were female students. Then, the sample was proportionally allocated to the four strata (Grade 9 to 12) where grade levels with larger student numbers received a larger sample (Larsen & Lavrakas, 2008). Proportional allocation of a sample in stratified sample yields more precise and representative estimates in the study (Larsen, 2008). Finally, three classrooms from the stratum (each grade level) were randomly selected, and all eligible male and female students in the selected classrooms from Grades 9 to 12 were included in the sample. Additional classrooms from the strata were randomly selected until data for the required sample were collected.

Figure 2*Sample Selection Process***Procedures for Recruitment, Participation, and Data Collection**

The purpose and social change effect of the research were explained to the research participants. The clarity in the research purpose improves the respondents' understanding of the benefits and risks associated with the research and enable them to provide their informed consent (Couper & Singer, 2009). The participants were also provided the right to withdraw and return at any time during data collection after signing the consent form distributed. The variables/constructs of the study were clearly defined

and the English version questionnaire was translated into a local language (Amharic) to improve understanding and clarity, hence the response rate (Wolf, 2008).

Primary data were collected from the sample of students using self-administered close-ended questionnaires. The questionnaire was designed in English and translated into Amharic (local language) for data collection (Appendix A and B). The use of closed-ended self-administered questionnaires could offer more privacy and appear to improve respondents' willingness to provide information on sensitive issues like sexual health and related problems (Burkholder et al., 2016; Bowling, 2005). Besides to reducing interviewer bias, the use of self-administered questionnaires is less expensive and provides a quick mode of collecting data from a large sample of students (Burkholder et al., 2016). The primary data included were demographic information about student (age, grade level, HIV comprehensive knowledge, condom use self-efficacy skills, marital status, and place of residence), parental factors (parental monitoring of adolescent), religious factors (religion and frequency of participation in religious activities), and student risky sexual behavior (ever had sexual intercourse, risky sexual behavior (protected or unprotected sexual intercourse). Moreover, primary data were collected on covariates including gender of student and parental factors (education status of both parents and perceived socioeconomic status of the household). A qualified male and female facilitators, who are health workers with BSC and Masters degree in public health, were recruited and trained on the purpose, significance, definition of key terms, and data collection instrument to facilitate data collection. The facilitators, who were

recruited from Kedida Gamela district of the same zone, only involved in clarifying the concepts when the respondents needed it.

Instrumentation and Operationalization of Constructs

Instrumentation involves the process of instrument development and data collection. According to Creswell (2014), instrumentation and operationalization of the variables/constructs is one of essential steps for the rigorous data collection. The important steps in the operationalization of the instrument includes defining the variables and identifying their level of measurement to improve the internal validity and reliability in this study (Hsu & Sandford, 2010). The constructs/variables in this study were measured at categorical (nominal and ordinal), interval, and scale levels. The fact is that the measurement levels of the variables determine the type of statistical test to be used in the data analysis (Daniel, 2013). The response statements for variables on the self-administered questionnaire were short and concise to reduce measurement errors. Likewise, the sitting arrangements for the students were made conducive, and anonymity of the information was ensured to reduce socially desirable responses and measurement errors (Hsu & Sandford, 2010).

Accordingly, the independent and dependent variables/constructs of the study, level of measurement, validity and reliability (internal consistency), and developer(s) of the instrument are presented as follows.

Operationalization of the Variables

Independent Variables

Age of the student (age in years) was measured at interval level. Date of birth (DD/MM/YYYY). Grade was measured as an ordinal variable, and coded as 1 = 9, 2 = 10, 3 = 11, and 4 = 12. Ethnicity was measured as a nominal variable. 1 = Kembata, 2 = Hadiya, 3 = Amhara; and 4 = others. Place of residence was measured as a nominal variable, and coded as 1 = rural, and 2 = urban.

Comprehensive HIV knowledge was a composite variable measured at a dichotomous scale level using seven items. The participants were categorized as having high HIV comprehensive knowledge if they identify at least two of the major ways of HIV prevention (abstinence from premarital sex, having single faithful partner, and consistent use of condoms), and reject at least three common local misconceptions about HIV transmission (a healthy-looking person cannot have HIV, HIV can be transmitted by mosquito bite; HIV can be transmitted by supernatural means; and a person can be infected by sharing food with a person who has HIV). Each item was measured by 'yes,' 'no,' and 'do not know' responses. The response finally was coded as '1' for correct responses, and as '0' for 'no' and 'do not know' responses. Then, the responses were dichotomized as having 'low' and 'high' comprehensive HIV knowledge after considering a total benchmark score of five. The instrument was adapted from WHO in 2001 and used by CSA & ICF (in 2005, 2011, 2016 in Ethiopia Demographic and Health Surveys), Oljira et al. (2013), and Badru (2020). The validity and reliability of the score was not reported.

Condom use self-efficacy was measured at scale level using a five-point Likert scale that ranges from *strongly disagree* to *strongly agree*. Brafford and Beck (1991) developed the 28 items condom use self-efficacy scale (CUSES) and validated it among college students in the United States and its internal consistency (Cronbach's α) was 0.91. Barkley and Burns (2000) further modified CUSES consisting of 10 items and validated the instrument among multicultural college students in Florida, the United States. The instrument constitutes three components of self-efficacy measures: Assertiveness (4 items), fear of partner rejection (3 items), and intoxicant control (3 items). The instrument's reliability coefficients for the three factors were 0.76, 0.83, and 0.66 respectively (Barkley & Burns, 2000). After modifying the instrument to fit the Ethiopian cultural context, Shaweno and Tekletsedik (2013) validated a 9 items instrument (CUSES-Ethiopia) among multicultural college students in southern Ethiopia. According to Shewano and Tekletsadik (2013), the reliability coefficients (Cronbach's α) of the instrument for assertiveness, fear of partner rejection, and intoxicant control were 0.86, 0.86, and 0.92 respectively. Likewise, the validity for the three factors were 0.61, 0.65, and 0.85, respectively supporting the instrument's construct validity (Barkley & Burns, 2000; Shaweno & Tekletsadik, 2013). Finally, the score of CUSES of 30 was considered to dichotomize the student's condom use self-efficacy as low and high. It was coded as 0 = low self-efficacy (<30), 1 = high self-efficacy (\geq 30).

Table 4*Summary of Reliability and Validity Report of Condom Use Self-Efficacy Score*

Construct	Author	Year	Cronbach's alpha	factor	
				Assertiveness	Fear of partner rejection
Condom use self-efficacy	Barkly & Burns	2000	0.76	0.83	0.66
	Shewano & Tekletsedik	2013	0.86	0.86	0.92

Perceived parental monitoring was measured using five yes/no questions that include (a) the parent knowledge of the adolescent whereabouts, friends, and activities; (b) parent regular supervision of adolescent activities; (c) adolescent disclosure of information to parents; (d) parent and adolescent discuss on sexual matters; and (e) parent controls and limits the adolescent's freedom. For analysis, the scores were summed up and dichotomized into low and high parental monitoring (Low = 0 if <3 and high = 1 if ≥ 3).

Religious affiliation of the student was measured as a nominal variable, and coded as 1 = Protestant, 2 = Catholic, 3 = Orthodox, 4 = Muslim, 5 = other. Participation in religious activities was measured as an ordinal, and coded as 0 = no, 1 = yes. The instrument is adapted from the previous studies (Haglund & Fehring, 2010; Kassahun et al., 2019; Wusu, 2011). It was measured as follows: 1 = more than once a week, 2 = once a week, 3 = 1-3 times a month, 4 = less than once a month, or never. For analysis, the response was dichotomized and coded as participation in religious activities, No = 0

(infrequent participation with three times per month or less) and Yes = 1 (frequent participation with one or more times per week).

Outcome Variable

Risky sexual behavior was measured as a dichotomous nominal variable. Have you ever had a sexual intercourse? 0 = No, and 1 = yes. If yes, in the last 12 months you had sexual intercourse, did you or your partner consistently used condoms? 0 = No, and 1 = yes.

External Variables (Covariates)

Gender of the student was measured as a nominal variable, and coded as 0 = M and 1 = F. Socioeconomic status of the parent was measured using the proxy indicators of parent education and perceived socioeconomic status of the household. The education status of both parents was measured as an ordinal variable. Accordingly, for both parents, the education status was coded as 1 = unable to read and write, 2 = Primary school, 3 = high school, 4 = college graduate and above. Perceived socioeconomic status of the household was measured as ordinal and rated from 1 to 5, with poorest households rated as 1 and the richest rated as 5. For analysis, the first two (poorest and poor) were categorized as poor, the middle remains as the same category, the two highest categories (rich and richest) were categorized as rich, and coded as 1 = poor, 2 = middle, and 3 = rich (Yimer & Ashebir, 2019). The authors did not report the internal consistency (reliability) of the instrument.

Table 5

Summary of Constructs/Variables, Levels of Measurement, and Coding Methods

Construct/variable	Level of measurement	Coding
Age	Interval	Numeric
Sex	Nominal	0 = M; 1 = F
Grade	Ordinal	1 = 9th, 2 = 10th; 3 = 10th; 4 = 12th
Ethnicity	Nominal	1 = Kembata; 2 = Hadiya; 3 = Amhara; 4 = other
Place of residence	Nominal	1 = Rural; 2 = Urban
Comprehensive HIV knowledge	Ordinal	0 = low knowledge; 1 = high knowledge
Condom use self-efficacy	Scale, then ordinal	0 = low condom use self-efficacy 1 = high condom use self-efficacy
Parental monitoring	Ordinal	0 = low parental monitoring; 1 = high parental monitoring
Religious affiliation of the student	Nominal	1 = protestant; 2 = catholic; 3 = orthodox; 4 = Muslim, 5 = other
Participation in religious activities	Ordinal	0 = No; 1 = yes
Unprotected sexual behavior	Nominal	0 = No; 1 = yes
Parental education	Ordinal	1 = unable to read and write; 2 = elementary school; 3 = high school; 4 = college graduate and above
Socioeconomic status of the parents	Ordinal	1 = poor; 2 = middle; 3 = rich

Data Analysis Plan

The data was analyzed using the Statistical Package for Social Sciences (SPSS) version 25.0 (IBM® SPSS®) after it was cleaned and coded. The data was entered into SPSS. Data analysis was conducted to assess the research participation rate (response rate). The results of the data analysis are presented in chapter 4 which included the demographic characteristics of the research participants, the descriptive analysis of the

predictor variables, and the prevalence of risky sexual practice among high school students. Additionally, an inferential analysis and statistical results to evaluate the hypotheses are presented.

Threats to Validity

One of the threats to validity in this research includes the design of the study as it does not provide information on causality. The results from the cross-sectional design establish only the association between the independent and dependent variables (Fink, 2015; Szklo & Nieto, 2014). The study participants were randomly selected, and variables were clearly defined to reduce a systematic bias resulting from the selection and data collection procedures (Forthofer et al., 2007; Szklo & Nieto, 2014). Moreover, information bias was reduced by the clear definition of independent and dependent variables, which in turn, could reduce the misclassification of the exposure and outcome. The mode of administration of the questionnaire appears to be the other threat to the validity of the study. The use of structured, close-ended, and self-administered questionnaire in this study could reduce the interviewer related bias, and provides more anonymity for the respondents, thereby improving the response rate (Forthofer et al., 2007; Szklo & Nieto, 2014).

Moreover, data collection instruments validated in the previous studies were used to make useful inferences from the scores of quantifiable data obtained from the questionnaire (Creswell, 2014). The fact is that the items in the instrument measure not only the hypothesized construct but also have implications for public health practice (Creswell, 2014). Likewise, an adequate and proportional sample was included from male

and female students to reduce the threats to external validity and improve the inference of the findings (Fuller, 2010). In addition, appropriate statistical analytic procedures were applied to improve the internal validity of the findings (Creswell, 2014).

Ethical Procedures

Ethical approval was obtained from the Institutional Review Board (IRB) of Walden University, with an approval number 06-25-21-0769877, to access and collect data from the research participants. Ethics clearance and permission letter were obtained from the Ethics Review Committee of the Southern State Regional Health Bureau of Ethiopia (see Appendix C). A support letter was obtained from the Kembata zone education and health departments, and Angacha district education office to access the Angacha senior high school administration and research participants. A support letter was also obtained from the school to access the research participants (see Appendix D). Research participants were provided adequate information on the purpose and benefits of the research to obtain an informed consent. Parents or legal guardians signed a consent form for participants less than 18 years. For those students aged more than 18 years, a consent was obtained. Additionally, an implied consent (assent) was obtained from the students below 18 years old.

Further, research participants were provided adequate information on their right for refusal or early withdrawal from the study. They were informed that their refusal to participate in the study would not have any consequences in attending their class. Those participants who refused or withdrawn were given the right to participate if they decided before the data collection is completed. The data was collected using structured, close-

ended self-administered questionnaire, and student identifiers (name, ID, and address) were not included in the data tool to improve the anonymity and privacy of the information, which in turn, could improve the response rate on this sensitive research topic. Instead, unique code was provided for each stratum that was randomly selected to participate in this research. A convenient time free of class schedules in the afternoon was arranged, and students were provided 100 Eth Birr (about 2.5 USD) for their transport to avoid delay to reaching their home in the rural areas.

In addition, the staff members of the school did not have access to the questionnaire and classrooms during data collection. The data collected was kept confidential and stored with a secure password only accessed by the researcher. The data will be destroyed 5 years after the research work is completed. The study findings would be shared to department of health, education, and other stakeholders working on HIV/AIDS prevention and control in the zone to maximize its social change effect. The researcher has no conflict of interest in this study.

Summary

In summary, this study employed a quantitative cross-sectional design to examine the association between the HIV-related personal, parental, and religious factors and the outcome of risky sexual behaviors among high school students in southern Ethiopia. This chapter provided detailed descriptions about the research methodology, research questions/hypotheses, research setting and participants, sample size and participant selection procedures, instrumentation, data collection, data analysis plan, and ethical

procedures. In Chapter 4, I provide details on data collection, analysis and the results of this study.

Chapter 4: Results

Introduction

The purpose of this study was to examine the association between a set of independent variables, including personal (comprehensive HIV knowledge, condom self-efficacy, and place of residence), parental (Parental monitoring and advice), and religious (frequency of participation at religious activities) factors and the outcome of risky sexual behaviors among a sample of high school students at Angacha district in southern Ethiopia. The examination of the broader determinants of risky sexual behavior among high school students can provide important evidence to decision makers and help them design effective interventions that protect the youth in underserved and predominately rural areas of southern Ethiopia from contracting HIV, leading to positive social change.

The following were the research questions and hypotheses for this study.

RQ1: Is there an association between comprehensive HIV knowledge and the sexual behavior of the student?

H01: There is no statistically significant association between comprehensive HIV knowledge and the sexual behavior of the student.

Ha1: There is a statistically significant association between comprehensive HIV knowledge and the sexual behavior of the student.

RQ2: Is there an association between condom use self-efficacy and the sexual behavior of the student?

H02: There is no statistically significant association between condom use self-efficacy and the sexual behavior of the student.

H02: There is a statistically significant association between condom use self-efficacy and the sexual behavior of the student.

RQ3: Is there an association between the place of residence and the sexual behavior of the student?

H03: There is no statistically significant association between the place of residence (urban vs. rural) and the sexual behavior of the student.

Ha3: There is a statistically significant association between the place of residence and the sexual behavior of the student.

RQ4: is there an association between parental monitoring and the sexual behavior of the student?

H04: There is no statistically significant association between parental monitoring and the sexual behavior of the student.

Ha4: There is a statistically significant association between parental monitoring and the sexual behavior of the student.

RQ5: Is there an association between the frequency of participation in religious activity and the sexual behavior of the student?

H05: There is no statistically significant association between the frequency of participation in religious activities and the sexual behavior of the student.

Ha5: There is a statistically significant association between the frequency of participation in religious activities and the sexual behavior of the student.

Data Collection

The data were collected between the October 12 and October 21, 2021. The original planned sample size was 403. However, the planned sample of 155 that was proportionally allocated for the ninth-grade stratum was not achieved as new senior schools were opened within the district. Only 70 students participated from the ninth grade; the remaining sample of 85 participants allocated for this stratum was redistributed for the other grades (10-12) based on their population size to improve the external validity of this research. A total of 391 students participated in the study, of which 374 (95.7%) consented and completed the self-administered questionnaire.

Data Analysis

Using SPSS Version 25, descriptive analysis was conducted for both independent and dependent variables. Results are presented as percentages, mean, standard deviation, and range of scores to describe the characteristics of the study population. The Cronbach's alpha statistics were computed to check for the internal consistency of condom use self-efficacy. Moreover, a continuous variable (age) of the participants was analyzed to check the normality of the data using the Kolmogorov-Smirnov test (Ghasemi & Zahediasl, 2012; Pallant, 2016). A significant Kolmogorov-Smirnov test ($P < 0.05$) indicated the data were not normally distributed (Ghasemi & Zahediasl, 2012). Therefore, instead of an independent t test, a Mann-Whitney U, a nonparametric test, was used to compare the mean CUSES among male and female students (Daniel & Cross, 2013).

Further, a bivariate logistic regression analysis was conducted to examine the association between independent and dependent variables and evaluate the hypotheses. Then, a stepwise multivariate logistic regression was computed to infer the value of the dependent variable (risky sexual behavior) by controlling for gender, parent education, and perceived socioeconomic status of the parent (Creswell, 2014; Daniel & Cross, 2013; Frankfort-Nachmias & Leo-Guerrero, 2018). The results are presented in tables in this chapter. The findings of the statistical tests were interpreted using statistical significance, 95% confidence intervals, and effect size.

Results

Sociodemographic Characteristics of the Participants

Of the 391 school adolescents who participated in this study, 374 (95.7%) responded to the self-administrated questionnaire. The majority of students, 348 (93%), were in the age range of 15–19 years with a mean age of 17.6 (SD = 1.44; see Table 7). The median age of the participants was 18 years whereas the minimum and maximum ages were 15 and 23 years, respectively. A negative skewness value of -0.029 indicated the data distribution was slightly skewed to the left revealing non-normal distribution of data. Furthermore, the age variable was used to assess the normality of data distribution and determine the type of inferential test to examine the mean condom use self-efficacy score between the groups. As shown in Table 6, the Kolmogorov-Smirnov test was statistically significant ($P < 0.001$), indicating abnormally distributed data. An independent t test, a parametric test, was not used to compute the mean difference in condom use self-efficacy score between males and females. Therefore, Mann-Whitney U,

a nonparametric test, was computed to evaluate the mean difference in condom use self-efficacy score between the groups.

Table 6

Test of Normality

	Kolmogorov-Smirnova			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Age of the student	.210	374	.000	.926	374	.000

a. Lilliefors Significance Correction

Table 7

The Age Distribution of the participants, Angacha District, Southern Ethiopia

		Frequency	Percent	Valid percent	Cumulative percent
Valid	15	46	12.3	12.3	12.3
	16	36	9.6	9.6	21.9
	17	72	19.3	19.3	41.2
	18	140	37.4	37.4	78.6
	19	54	14.4	14.4	93.0
	20	18	4.8	4.8	97.9
	21	7	1.9	1.9	99.7
	23	1	.3	.3	100.0
	Total	374	100.0	100.0	

Age

N	Valid	374
	missing	0
Mean		17.56
Median		18.00
Std. deviation		1.44
Skewness		-.029
Std. error of skewness		.126
Kurtosis		.12
Std. error of kurtosis		.252
Minimum		15
Maximum		23

As depicted in Table 8, 217 (58.3%) of the research participants were male students, and 155 (44.7%) were female students. Moreover, 246 (65.8%) of the research participants were 10th- and 11th-grade adolescents. The majority of the research participants, 337 (90.1%), belong to the Kembata ethnic group, and 252 (67.6%) follow the protestant religion. Regarding the place of residence, 150 (40.1%) were from rural areas and 224 (59.9%) were from urban areas.

Table 8

Demographic Characteristics of Survey Participants, Angacha District, Southern Ethiopia

Construct/variable	Frequency	Percent	Valid percent
Gender			
M	217	58.0	58.3
F	155	44.4	44.7
Total	372	99.5	100
Grade			
9	53	14.2	14.2
10	114	30.5	30.5
11	132	35.3	35.3
12	75	20.1	20.1
Total	374	100	100
Ethnicity			
Kembata	337	90.1	90.1
Hadiya	12	3.2	3.2
Amhara	15	4.0	4.0
Others	10	2.7	2.7
Total	374	100	100
Place of residence			
Rural	150	40.1	40.1
Urban	224	59.9	59.9
Total	374	100	100
Religious affiliation			
Protestant	252	67.4	67.6
Catholic	29	7.8	7.8
Orthodox	55	14.7	14.7
Muslim	13	3.5	3.5
Others	24	6.4	6.4
Total	373	99.7	100

Note. Under gender, 2 responses were missing, and under religious affiliation, 1 response was missing.

Concerning the educational status of parents, 124 (33.3%) respondents reported their mothers cannot read and write; 98 (26.3%) reported their mothers completed primary level, 80 (21.4%) high school, and 71 (19%) college graduate and above.

Additionally, 152 (40.6%) respondents reported fathers as college graduates and above; 81 (17.1%) reported fathers who completed primary school level and 77 (20.6%) reported fathers who cannot read and write. In addition, 209 (55.9%) of the participants rated their perceived parent socioeconomic status as middle; 88 (23.5%) reported as rich and 77 (20.6%) rated their parents' socioeconomic status as poor (see Table 9).

Table 9

Sociodemographic Characteristics of Parents, Angacha District, Southern Ethiopia

Construct/variable	Frequency	Percent	Valid percent
Mother's educational status			
Cannot read and write	124	33.2	33.2
Primary school	98	26.2	26.3
High school complete	80	21.4	21.4
College graduate and above	71	19.0	19
Total	373	99.7	100
Father's educational status			
Cannot read and write	77	20.6	20.6
Primary school	81	21.7	21.7
High school complete	64	17.1	17.1
College graduate and above	152	40.6	40.6
Total	374	100	100
Perceived socioeconomic status			
Poor	77	20.6	20.6
Middle	209	55.9	55.9
Rich	88	23.5	23.5
Total	374	100	100

Note. Under mother's educational status, 1 response was missing.

Research participants were assessed on their level of knowledge of major HIV preventive measures and prevailing misconceptions about HIV in the study area. Accordingly, among 374 participants, 218 (58.4%) had low comprehensive HIV knowledge and 155 (41.6%) adolescents had high comprehensive HIV knowledge. Moreover, of 153 participants who had high comprehensive HIV knowledge, 90 (58.8%)

were male, while 63 (41.2%) were female (see Table 11). Likewise, a nine-item condom use self-efficacy score was used on a five-point Likert scale to assess participants' perspectives on assertiveness, fear of partner rejection, and intoxicant control components of the variable. Among 374 participants, 192 (51.3%) scored a high condom use self-efficacy score, and 182 (48.7%) scored a low condom use self-efficacy score on the scale. Perceived paternal monitoring of the adolescent was also assessed using five items. Among 374 participants, 251 (67.1%) reported high paternal monitoring, and among 274 participants, 270 (72.2%) reported high maternal monitoring. Of 335 participants, 269 (80.3%) reported frequent participation in religious activities (see Table 10).

Table 10

Personal, Parental, and Religious Characteristics of the Respondents, Angacha District, Southern Ethiopia

Construct/variable	Frequency	Percent	Valid percent
Comprehensive HIV knowledge			
Low	218	58.3	58.4
High	155	41.4	41.6
Total	373	99.7	100.0
Condom use self-efficacy score			
Low	182	48.7	48.7
High	192	51.3	51.3
Total	374	100	100
Father monitors student			
Low	123	32.9	32.9
High	251	67.1	67.1
Total	374	100	100.0
Mother monitors student			
Low	104	27.8	27.8
High	270	72.2	72.2
Total	374	100	100.0
Frequency of religious participation			
Low	66	17.6	19.7
High	269	71.9	80.3
Total	335	89.6	100.0

Note. Under comprehensive HIV knowledge, 1 response was missing, and under

frequency of religious participation, 39 responses were missing.

Table 11

Gender Versus Comprehensive HIV Knowledge of the Student, Angacha District, Southern Ethiopia

Gender		Comprehensive HIV knowledge of the student		Total
		Low	High	
Male	Count	126	90	216
	% within comprehensive HIV knowledge of the student	57.8%	58.8%	58.2%
Female	Count	92	63	155
	% within comprehensive HIV knowledge of the student	42.2%	41.2%	41.8%
Total	Count	218	153	371
	% within comprehensive HIV knowledge of the student	100.0%	100.0%	100.0%

Prevalence of Risky Sexual Behavior Among High School Students

Regarding sexual behavior, as depicted in Table 12, from the total of 373 participants, 163 (43.7%) reported they had experienced sexual intercourse. Those who have had sexual intercourse were asked whether they had consistently used condoms during sexual intercourse in the 12 months prior to the survey. Among 163 participants, 87 (53.4%) reported consistently using condoms during sexual intercourse, and 76 (46.6%) reported not consistently using condoms. This finding was in line with other studies in South Africa and Cameroon (Awotidebe et al., 2014; Nubed & Akoachere, 2016). However, the proportion was lower when compared with other study findings in Adama, Ethiopia, which was 66.7% (Wana et al., 2019); in Jiga high school in Northern Ethiopia, which was 83.3% (Kassahun et al., 2016); and in Eastern Cape, South Africa,

which was 72.8% (Adeboye et al., 2016). The prevalence of risky sexual behavior in the study site was 30.04/1,000 population.

Table 12

Characteristics of Participants by Exposure to Risky Sexual Behavior, Angacha District, Southern Ethiopia

		Frequency	Percent	Valid percent
Ever had sexual intercourse	No	210	56.1	56.3
	Yes	163	43.7	43.7
	Total	373	99.7	100.0
Engaged in unprotected sex	No	87	23.3	53.4
	Yes	76	20.3	46.6
	Total	163	43.6	100.0

Note. Under ever had sexual intercourse, 1 response was missing, and under engaged in unprotected sex, 211 responses were missing.

Analysis of Research Questions/Hypotheses

Bivariate and multivariate logistic regression was computed using SPSS version 25 to evaluate whether the association exists between independent variables (comprehensive HIV knowledge, place of residence, condom use self-efficacy score, parental monitoring, and frequency of participation in religious activities) and the dependent variable, unprotected sex. Mann-Whitney U test, a non-parametric test was conducted to evaluate whether a statistically significant difference exists between males and females in condom use self-efficacy score. Cronbach's Alpha was computed to assess the internal validity of responses of the items used to measure the condom use self-efficacy score of the respondents.

Table 13

Summary of the Constructs and the Inferential Statistics Used to Evaluate the Hypotheses

Research question	Independent variable	Dependent variable	Inferential statistics
1	Comprehensive HIV knowledge	Unprotected sex (no, yes)	Bivariate and multivariate logistic regression
2	Place of residence	Unprotected sex (no, yes)	Bivariate and multivariate logistic regression
3	Condom use self-efficacy score	Unprotected sex (no, yes)	Bivariate and multivariate logistic regression
4	Parental Monitoring	Unprotected sex (no, yes)	Bivariate and multivariate logistic regression
5	Frequency of participation in religious activities	Unprotected sex (no, yes)	Bivariate and multivariate logistic regression

Research Question 1

RQ1: Is there an association between comprehensive HIV knowledge and the sexual behavior of the student?

H01: There is no statistically significant association between comprehensive HIV knowledge and the sexual behavior of the student.

Ha1: There is a statistically significant association between comprehensive HIV knowledge and the sexual behavior of the student.

Using SPSS Version 25, bivariate logistic regression analysis was conducted to evaluate the hypothesis. One of the important assumptions to be met for analysis includes a binary outcome/dependent variable and a larger sample size. In this research, both

conditions were met. Accordingly, the association between HIV comprehensive knowledge and risky sexual behavior of the student was not statistically significant, $P = 0.562$, $OR = 1.209$, $95\% CI [0.636, 2.296]$. Therefore, I failed to reject the null hypothesis (see Table 21).

Table 14

Summary of Result for Research Question/Hypothesis 1

Independent variable	Dependent variable	Inferential test	P value	OR	Outcome
HIV Comprehensive Knowledge	Unprotected sex	Bivariate logistic regression	0.562	1.209	I failed to reject the null hypothesis

Research Question 2

RQ2: Is there an association between condom use self-efficacy and the sexual behavior of the student?

H02: There is no statistically significant association between condom use self-efficacy and the sexual behavior of the student.

H02: There is a statistically significant association between condom use self-efficacy and the sexual behavior of the student.

The reliability test was computed to assess the internal consistency of the five-point Likert scale that was used to assess the perspectives of the adolescents about their confidence to use condoms during sexual intercourse with a casual partner. As shown in Table 15, the Cronbach's Alpha is 0.79, 0.75, and 0.83 for the full sample, male, and female sub-samples of the high school students respectively indicating moderately high

reliability of the scale that is consistent with previous studies (Shewano & Tekletsedik, 2013; Barkley & Burns, 2000).

Table 15

Reliability Statistics for Condom Use Self-Efficacy Score

	Cronbach's alpha	Cronbach's alpha based on standardized items	N of items
Full sample	.786	.788	9
Male	.746	.750	9
Female	.834	.834	9

Then bivariate logistic regression was computed to determine if there was a statistically significant association between condom use self-efficacy score and risky sexual behavior of the student. As depicted in Table 21, the association between condom use self-efficacy score and risky sexual behavior of the student was statistically significant, $P = 0.025$, $OR = 2.296$, 95% CI [1.109, 4.752]. Therefore, I rejected the null hypothesis (see Table 21).

Table 16

Summary of Result for Research Question/Hypothesis 2

Independent variable	Dependent variable	Inferential test	P value	OR	Outcome
Condom use self-efficacy score	Unprotected sex	Bivariate logistic regression	0.025	2.296	I rejected the null hypothesis

Further analysis was conducted to determine if there was a difference in mean condom use self-efficacy score between male and female students. (see Table 17). A

Mann-Whitney U test revealed that the mean condom use self-efficacy score for males (Mdn = 3.44) was significantly higher than females (Mdn = 3.22), $U = 14523.5$, $P = 0.025$, $\eta^2 = 0.016$. However, the effect size was small.

Table 17

Mann-Whitney U Test for Comparing Mean Condom Use Self-Efficacy Score among Male and Female Students, Angacha District, Southern Ethiopia

Report

Mean

Gender of the student	Mean CUSES
Male	3.4444
Female	3.2222
Total	3.3333

Test Statistics^a

	Mean CUSES
Mann-Whitney U	14523.500
Wilcoxon W	26613.500
Z	-2.247
Asymp. Sig. (2-tailed)	.025

a. Grouping Variable: Gender of the student

Measures of Association (Effect Size)

	Eta	Eta squared
Mean CUSES * Gender of the student	.126	.016

Research Question 3

RQ3: Is there an association between the place of residence and the sexual behavior of the student?

H03: There is no statistically significant association between the place of residence (urban vs. rural) and the sexual behavior of the student.

Ha3: There is a statistically significant association between the place of residence and the sexual behavior of the student.

A bivariate logistic regression analysis was conducted to determine if there was a statistically significant association between the place of residence and the risky sexual behavior of the student. As depicted in Table 21, the association between place of residence and risky sexual behavior of the student was not statistically significant, $P = 0.431$, $OR = 1.283$, 95% CI [0.690, 2.385]. Therefore, I failed to reject the null hypothesis.

Table 18

Summary of Result for Research Question/Hypothesis 3

Independent variable	Dependent variable	Inferential test	P value	OR	Outcome
Place of residence	Unprotected sex	Bivariate logistic regression	0.431	1.283	I failed to reject the null hypothesis

Research Question 4

RQ4: is there an association between parental monitoring and the sexual behavior of the student?

H04: There is no statistically significant association between parental monitoring and the sexual behavior of the student.

Ha4: There is a statistically significant association between parental monitoring and the sexual behavior of the student.

Using SPSS, a bivariate logistic regression was computed to determine if there was a statistically significant association between parental monitoring and risky sexual behavior of the student. Data were collected for both parents' perceived monitoring of the student using dichotomous five items choices, then categorized as high and low paternal/maternal monitoring based on the benchmark score. The bivariate logistic regression result, as shown in Table 21, revealed that the association between the father's monitoring and risky sexual behavior of the student was not statistically significant, $P = 0.727$, $OR = 0.727$, 95% CI [0.336, 2.139]. However, the association between the mother's monitoring and risky sexual behavior of the student was statistically significant, $P = 0.003$, $OR = 2.540$, 95% CI [0.978, 6.593].

Table 19

Summary of Result for Research Question/Hypothesis 4

Independent variable	Dependent variable	Inferential test	P value	OR	Outcome
Parental (Mother) monitoring	Unprotected sex	Bivariate logistic regression	0.003	2.540	I rejected the null hypothesis

Research Question 5

RQ5: Is there an association between the frequency of participation in religious activity and the sexual behavior of the student?

H05: There is no statistically significant association between the frequency of participation in religious activities and the sexual behavior of the student.

Ha5: There is a statistically significant association between the frequency of participation in religious activities and the sexual behavior of the student.

Using SPSS, a bivariate logistic regression analysis was conducted to evaluate the hypothesis. As shown in Table 21 below, the association between the frequency of participation in religious activities and risky sexual behavior of the student was statistically significant, $P = 0.014$, $OR = 0.353$, 95% CI [0.153, 0.811].

Table 20

Summary of Result for Research Question/Hypothesis 5

Independent variable	Dependent variable	Inferential test	P value	OR	Outcome
Frequency of participation in religious activities	Unprotected sex	Bivariate logistic regression	0.014	0.353	I Rejected the null hypothesis

Table 21*Bivariate Logistic Regression for Predictor and Outcome Variables*

Step 1 ^a	B	S.E.	Wald	Df	P value	OR	95% CI for OR	
							Lower	Upper
Place of residence(1)	-.295	.375	.621	1	.431	1.283	.690	2.358
Comprehensive HIV knowledge of the student(1)	.011	.387	.001	1	.562	1.209	.636	2.296
Condom use self-efficacy score of the student(1)	.831	.371	5.011	1	.025	2.296	1.109	4.752
Father monitors the student(1)	-.165	.472	.122	1	.727	.848	.336	2.139
Mother Monitors the student(1)	.932	.487	3.666	1	.003	2.540	.978	6.593
Student frequently participates in religious activities(1)	- 1.042	.425	6.023	1	.014	.353	.153	.811
Constant	-.360	.391	.847	1	.357	.698		

a. Variable(s) entered on Step 1: Place of residence, Comprehensive HIV knowledge of the student, Condom use self-efficacy score of the student, Father monitors the student, Mother Monitors the student, Student frequently participates in religious activities.

Further, for the variables that showed a statistically significant association in the bivariate logistic regression model with the outcome variable, a risky sexual behavior, a stepwise multivariate logistic regression was computed by removing one statistically insignificant variable at a time in the modeling phase to determine the influence of the confounding variables.

As shown in Table 23, the Cox and Snell and Nagelkerke R square value indicated that the multivariate logistic regression model predicted between 27.4 % and 36.7% of the change in the dependent variable. Moreover, as shown in Table 24, the

Hosmer-Lemeshow test was not statistically significant ($P > 0.05$), revealing better goodness of fit of the model (Frankfort-Nachmias & Leo-Guerrero, 2018).

Table 22

Model Summary

Step	-2 Log likelihood	Cox & Snell R square	Nagelkerke R square
1	149.053 ^a	.274	.367

a. Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.

Table 23

Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	5.384	8	.716

Accordingly, in the multivariate logistic regression modeling, there was a statistically significant association between condom use self-efficacy score and sexual behavior of the student after controlling for the covariates gender, education status of the parents, and perceived socioeconomic status of the student, $P = 0.048$, OR = 2.227, 95% CI [1.007, 4.925]. Therefore, I rejected the null hypothesis. Moreover, the association between parent (mother) monitoring and the student sexual behavior remained statistically significant after gender, parent education, and perceived socioeconomic status was held constant in the multivariate regression model, $P = 0.027$, OR = 2.844, 95% CI [1.011, 8.008]. Therefore, I rejected the null hypothesis. Furthermore, after multivariate regression modelling, the association between frequency of participation in religious activities and the sexual behavior of the student remained statistically

significant after holding gender, parent education, and perceived socioeconomic status of the student constant, $P = 0.003$, $OR = 0.240$, 95% CI [0.094, 0.612]. Therefore, I rejected the null hypothesis. (see Table 24 below).

Table 24

Multivariate Logistic Regression Model for Predictor and Outcome Variables

Step 1 ^a	B	S.E.	Wald	Df	P value	OR	95% CI for OR	
							Lower	Upper
Condom use self-efficacy score of the student(1)	.801	.405	3.909	1	.048	2.227	1.007	4.925
Mother Monitors the student(1)	1.045	.528	3.921	1	.027	2.844	1.011	8.004
Student frequently participates in religious activities(1)	-1.426	.477	8.946	1	.003	.240	.094	.612
Gender of the student	.583	.408	2.043	1	.153	1.792	.805	3.988
Education level of the student's mother	-.152	.257	.352	1	.553	.859	.519	1.420
Education level of the student's father	-.160	.221	.520	1	.471	.852	.552	1.315
Perceived socioeconomic status of student's parent	-.615	.303	4.111	1	.043	.541	.298	.980
Constant	1.534	.801	3.670	1	.055	4.635		

a. Variable(s) entered on step 1: Place of residence, Comprehensive HIV knowledge of the student, Condom use self-efficacy score of the student, Father monitors the student, Mother Monitors the student, Student frequently participates in religious activities, Gender of the student, Education level of the student's mother, Education level of the student's father, Perceived socioeconomic status of student's parent.

Summary

The purpose of this study was to examine the association between a set of independent variables, including personal (comprehensive HIV knowledge, condom use self-efficacy, and place of residence), parental (parental monitoring and communication), religious (frequency of participation in religious activities) and the outcome of risky sexual behaviors among a sample of high school students at Angacha rural district in southern Ethiopia. The primary data were collected between the 12th to 21st of October 2021 from the participants.

Descriptive statistics, reliability test, Mann-Whitney U test, bivariate and multivariate logistic tests were computed to describe the sample and answer the research hypotheses.

The results of descriptive and inferential statistics were presented in this chapter using tables. The prevalence of risky sexual behavior among high school students was 30.04/1000 population. A statistically significant association existed between condom use self-efficacy score, maternal monitoring of the student, frequency of participation in religious activities and risky sexual behavior of the student. However, the association between comprehensive HIV knowledge, place of residence and father's monitoring and risky sexual behavior of the student were not statistically significant. It was found that the prevalence of risky sexual behavior in the study area was unexpectedly high.

Chapter 5 presents the interpretations of the study findings, limitations of the study, recommendations for practice and future research, implications for social change, and conclusion.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

The purpose of this study was to examine the association between a set of independent variables, including personal (comprehensive HIV knowledge, condom self-efficacy, and place of residence), parental (Parental monitoring and advice), and religious (frequency of participation at religious activities) factors, and the outcome of risky sexual behaviors among a sample of high school students at Angacha district in southern Ethiopia. The examination of the broader determinants of risky sexual behavior among high school students can provide important evidence to decision makers and help them design effective interventions that protect the youth in underserved and predominately rural area of southern Ethiopia from HIV, leading to positive social change.

The prevalence of risky sexual behavior among high school students was 30.04/1,000 population. A statistically significant association existed between condom use self-efficacy score, maternal monitoring of the student, and frequency of participation in religious activities and risky sexual behavior. However, the associations were not statistically significant between comprehensive HIV knowledge, place of residence, and father's monitoring and risky sexual behavior. The prevalence of risky sexual behavior in the study area was unexpectedly high.

Interpretations of the Findings

Young adolescents appear to be at an increased risk of HIV infection because of the complex interaction of social determinants of health surrounding their sexual life

(Solar & Irwin, 2010). There is emerging evidence that risky sexual behaviors are on the rise among high school adolescents. In this research, I used a socioecological theory to explain the complex interactions of risk factors that affect the sexual life of adolescents. According to this theory, sexual behavior is shaped by multiple levels of influences, which include intrapersonal characteristics, interpersonal process, and community contexts (Bronfenbrenner, 1994; Richard et al., 2011). Therefore, the results are interpreted in the context of the theoretical framework used for this research.

Intrapersonal (Micro Level) Predictors

The intrapersonal characteristics represent the micro level of the socioecological model. Three constructs (comprehensive HIV knowledge, condom use self-efficacy, and place of residence) were considered from this level to formulate a hypothesis as predictors of risky sexual behavior among adolescent students. The micro level also interacts with other determinants at other levels of the socioecological model.

Comprehensive HIV Knowledge

Comprehensive HIV knowledge is at the core of health literacy that could protect youth from engaging in risky sexual practices. As a modifiable risk factor, improving comprehensive HIV knowledge has been targeted to curb the HIV pandemic among adolescents. Despite recognizing HIV comprehensive knowledge as an important protective factor against risky sexual behavior, the progress made has been unacceptably low to sustain the achievements gained in controlling the pandemic nationally and globally (UNAIDS, 2018).

In this study, I found that 153 (41.2%) of the participants had high comprehensive HIV knowledge. The proportion is far lower than the study finding at Jiga high school in Northern Ethiopia, which was 64% (Kassahun et al., 2016). However, the proportion of adolescents with high comprehensive HIV knowledge appeared to be higher when compared with the EDHS findings of the national average (41.2% versus 24.3%) and the average for the southern region of Ethiopia (41.2% versus 15.7%) (CSA & ICF International, 2016). Moreover, the proportion is also higher when compared with study findings in eastern Ethiopia (41.2% versus 24.5%) (Oljira et al., 2013).

However, the association between the HIV comprehensive knowledge and risky sexual behavior of the student was not statistically significant, $P = 0.562$, $OR = 1.209$, 95% CI [0.636, 2.296]. This finding revealed that both adolescents with high and low comprehensive HIV knowledge had similar vulnerability to engage in risky sexual behavior. The finding appears to be consistent with the finding in Botswana (Latemo & Mokgathe, 2013), but is inconsistent with the other studies' findings where a low HIV comprehensive knowledge increases the risk to engage in risky sexual behavior (Awotidebe et al., 2014; Adeboye et al., 2016; Ajide & Balogun, 2018). This may underscore the influence of other risk factors at the different levels of the socioecological model, as the behavior does not occur in a vacuum.

Condom Use Self-Efficacy Score

Self-efficacy refers to a person's judgment of their confidence or capability to perform a certain desired behavior (Bandura, 1995; Burrell et al., 2018). Students' confidence to consistently use condoms in different challenging situations was assessed

using a five-point Likert scale. A statistically significant association was found between condom use self-efficacy and risky sexual behavior after multivariate logistic regression analyses. It was found that adolescents with a high condom use self-efficacy score were 2.2 times more likely to consistently use condoms during sexual intercourse compared to those with a low condom use self-efficacy score ($P = 0.048$, $OR = 2.227$, $95\% CI [1.007, 4.925]$). The finding confirms other study findings that higher condom use self-efficacy appears to protect from risky sexual behavior (Bogale et al., 2010; Gebreselassie et al., 2013; Latemo & Mokgatlhe, 2013). Nonetheless, a methodological difference in measuring condom use self-efficacy score exists in the literature, and some researchers used a dichotomous versus a Likert-type response choice; as a result, the study findings here need to be interpreted with caution.

Even though the effect size is small, there was a statistically significantly higher condom use self-efficacy score among male students compared with female students. This finding provides an important clue to all stakeholders to design interventions that empower female adolescents to demonstrate higher condom use self-efficacy to protect themselves from HIV and related risks. Women may be at increased risk of acquiring HIV because of the complex biological, social, and economic factors surrounding their sexual life.

Place of Residence

A place of residence is an important social determinant of health in shaping individual behavior and health outcomes. Place of residence principally affects health outcomes by limiting access to and use of health information and services (Khuzwayo &

Taylor, 2018). In this study, a statistically significant association did not exist between place of residence and risky sexual behavior, $P = 0.431$, $OR = 1.283$, 95% CI [0.690, 2.358]. As pointed out in the literature review, findings regarding the association between place of residence and risky sexual behavior were inconclusive. The finding in the present study is inconsistent with other study findings in which urban residence was associated with a higher risky sexual behavior in Vietnam (Ngoc Do et al., 2020). The finding of this study is also not consistent with other study findings where rural residence was associated with higher risky sexual behavior among adolescents (Folayan et al., 2015; Kangmennaang et al., 2019; Nigussie et al., 2020; Wild et al., 2010). Another place of residence-specific factors and confounders unknown to me in the different levels of the socioecological model may have affected the association between the two variables.

Interpersonal (Micro Level) Predictors

Parental Monitoring

Parents play a key role in shaping the behavior, health, and social outcomes of their children. Perceived parental monitoring was assessed using five dichotomous questions and classified as low and high parental monitoring for both parents based on the benchmark value. Paternal monitoring of the adolescent was not significantly associated with risky sexual behavior, $P = 0.727$, $OR = 0.848$, 95% CI [0.336, 2.139]. However, adolescents who reported high maternal monitoring were about 2.5 times less likely to engage in risky sexual behavior. This finding is consistent with other research findings (Keijsers et al., 2016; Mahat et al., 2016; Tuason et al., 2017; Yimer & Ashebir, 2019). The protective effect of maternal monitoring against risky sexual behavior in this

study, in contrast with paternal monitoring, may be explained by the more egalitarian and reciprocal relationships between mother and adolescent improving self-esteem, emotional regulation skills, and independent decision-making capacity of adolescents.

Community (Meso Level) Predictors

In this study, I focused on the sociological (external practice) aspect of the religious dimension. External religious practice appears to influence adolescent sexual behavior through social support benefits from group membership and practice in a religious community network (Pearce et al., 2017). In this study, adolescents who reported frequent participation in religious activities were about 4.2 times less likely to engage in risky sexual behavior. The finding is in line with previous findings (Kassahun et al., 2019; Rew et al., 2011; Tolera et al., 2019). The integration of adolescents with low-risk peers and increased social support from religious teachings may explain the protective effect of frequent participation in religious activities against risky sexual behavior.

Limitations of the Study

This study was not without limitations. First, cross-sectional studies cannot be used to infer causality because of the difficulty of determining the temporal sequence between the risk factors and the outcome. Hence, an attempt to infer the observed association between the independent and dependent variables of the study could lead to a temporal bias (Szklo & Nieto, 2014). Second, because premarital sex is not a socially desirable behavior in many cultures, some respondents may have concealed their experience of exposure to a risky sexual behavior leading to a social desirability response

bias, which in turn results in a lower prevalence of risky sexual behavior in the area.

However, the use of a self-administered questionnaire in this study should have reduced the social desirability bias by providing privacy and anonymity for the respondents.

Third, the exposure factors that were not measured in this study at all levels of the socioecological model and that were unknown to me could have confounded the association between the independent and dependent variables, leading to a spurious relationship. Fourth, inaccurate responses to sensitive questions could also have caused a measurement bias, resulting in misclassification of the independent variables. Lastly, in the present study, I only focused on unprotected heterosexual vaginal sex as risky sexual behavior. Other modes of risky sexual behaviors that increase adolescents' vulnerability to HIV infections were not included. Notwithstanding the above limitations, this research has a better external validity because of a larger sample included in this sensitive topic. Further, this study contributes to the knowledge base in the literature on the prevalence and predictors of risky sexual behavior among school adolescents in the underserved part of southern Ethiopia.

Recommendations

Despite remarkable gains in reducing the incidence and prevalence of HIV/AIDS in the last three decades, risky sexual behaviors among adolescents are on the rise in Ethiopia. To curb this challenge, policymakers and all stakeholders need to place effective sexual health promotion approaches in the framework of the socioecological model to address the various social determinants of risky sexual behavior among adolescents. Such an approach should effectively engage parents and religious

institutions in the sexual health program to address risky sexual behaviors of adolescents and maximize the protective effect of parental monitoring and social support in the religious network. Life skills training on condom use self-efficacy remains one of the essential tools to protect adolescents from HIV. The fact is that no sexual intercourse without condoms appears to be safe as relationships during adolescence are often short and not with a single sexual partner. Moreover, effective interventions are needed to empower female adolescents to demonstrate higher condom use self-efficacy skills because of their increased vulnerability to HIV infection.

Future research on the social determinants of risky sexual behavior among adolescents should explore the role of intrapersonal characteristics such as self-esteem, risk-taking, and sensation seeking) and community context (school connectedness) in the framework of the socioecological model to address the challenges. Future research needs to further examine the complex nature of parent-adolescent connectedness in its sociocultural context in urban and rural areas in traditional societies like Kembata to maximize the protective effect of parental monitoring against risky sexual behavior,

Implications

This study presents the extent of HIV-related risk factors and the prevalence of risky sexual behavior in the area and informs action that contributes to addressing the social problem. Hence, the evidence generated from the present study is expected to inform decision-makers of the school, ministry of education, ministry of health, and civil societies working on HIV/AIDS prevention to design effective school-based sexual health promotion programs that could curb the rising incidence of risky sexual behaviors

among school adolescents. Effective sexual health promotion programs at schools may have a ripple effect (positive externality) to positively impact the community for sustainable social change (Getzen, 2013). For instance, school adolescents empowered with life skills to take healthy action on sexual health-promoting behaviors could also protect their community from HIV infections. Therefore, the outcome of the research is expected to benefit the students and the community at large.

The finding of the study could help in building knowledge and learning for all stakeholders involved in the HIV/AIDS response. Similarly, the study's findings could also fill the knowledge gap in the field and provide the basis for further studies that advance social change.

Conclusion

Ethiopia has achieved a significant reduction in HIV incidence and prevalence in the past two decades. Nevertheless, there is emerging evidence on the resurgence of risky sexual behavior among adolescents, who are the most vulnerable group of the population. Adolescent sexuality appears to be influenced by the multiple layers of social determinants of health. This study revealed an unexpectedly high prevalence of risky sexual behaviors and identified important predictors among high school adolescents in Angacha district of Kembata zone, which is one of the most underserved areas in the country. Policy action is needed to design effective school-based sexual health promotion programs in the framework of the socioecological model to reverse the rising incidence of risky sexual behavior among adolescents. The investment in the sexual health of school adolescents maximizes social change as it could have a ripple effect (positive

externality) in protecting the out-of-school adolescents and the wider community from HIV and related problems.

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Appendix A: Survey Questionnaire

Introduction

1. My name is Gizachew Kebede, a doctoral candidate of PhD in public health at Walden University. I am conducting this research as a partial requirement to complete my study in Doctor of Philosophy in Public Health. I strongly appreciate your taking time to complete the self-administered questionnaire which could last only 30-45 minutes.
2. The purpose of this study is to assess risk factors that increase the vulnerability of school youth to HIV infection, and use the study findings to strengthen the HIV/AIDS prevention and control activities in the school and communities to protect them from HIV.
3. The information collected from the research participants will be anonymous and kept confidential. I guarantee that person identifying information will not be collected from any student.
4. Research participants have the right to withdraw at any time from this study. The participants can equally have the right to return to participate in the research on the date of data collection after signing the consent form distributed.
5. As future researchers, the students need to be honest and rational in providing the correct response to all the research questions which contribute to research data quality and achieve the study objective.
6. Please ask the facilitators for any clarification of the concepts.

General Information

Student code-----Classroom code.....district (Woreda).....

Zone.....Region.....Country.....

Please provide the correct answer for the following sociodemographic questions

1. Age of the student (age in years): -----
2. Date of birth (DD/MM/YYYY). ----/----/----

3. Sex: 0 = Male; 1 = Female
4. Grade: 1 =9th; 2 =10th; 3 =11th; 4 =12th.
5. Ethnicity: 1 = Kembata, 2 = Hadiya, 3 = Amhara, 4 = other. please specify-----

6. Place of residence: 1 = rural, and 2 = urban
7. **Comprehensive HIV knowledge:**

Please choose the correct answer as ‘yes’, ‘no’ or ‘do not know’ for the following HIV knowledge and belief-related questions.

6.1. HIV can be prevented by:

- a. Abstaining from premarital sex:

0 = No; 1 = yes; 2 = do not know

- b. Having a faithful single partner:

0 = No; 1 = Yes; 2 = do not know

- c. Consistent use of condoms:

0 = No; 1 = Yes; 2 = do not know

6.2: Beliefs about HIV transmission

- a. A healthy looking person cannot have HIV:

0 = No; 1 = Yes; 2 = do not know

- b. HIV can be transmitted by mosquito bite:

0 = No; 1 = Yes; 2 = do not know

- c. HIV can be transmitted by supernatural means:

0 =No; 1 =Yes; 2 = do not know

d. A person can be infected HIV by sharing food and other items with a person who has HIV:

0 = No; 1 = Yes; 2 = do not know.

8. Condom use self-efficacy (CUSES):

Please rate your personal ability/confidence on the five-point scale provided about condom use on the following nine questions.

Factor 1: Assertiveness

- A. I feel confident in my ability to discuss condom usage with any partner I might have
1. Strongly disagree, 2. disagree, 3. Neither agree nor disagree, 4. Agree, 5. Strongly agree
- B. I feel confident in my ability to suggest using condoms with a new partner
1. Strongly disagree, 2. disagree, 3. Neither agree nor disagree, 4. Agree, 5. Strongly agree
- C. I feel confident I could suggest using a condom without my partner feeling “diseased”.
1. Strongly disagree, 2. disagree, 3. Neither agree nor disagree, 4. Agree, 5. Strongly agree
- D. I feel confident in my ability to persuade a partner to accept using a condom when we have sex.
1. Strongly disagree, 2. disagree, 3. Neither agree or disagree, 4. Agree, 5. Strongly agree

Factor 2: Fear for partner rejection

E. I feel confident suggesting using condoms with a new partner because I would not be afraid he or she would think I've had a sexual experience.

1. Strongly disagree, 2. disagree, 3. Neither agree nor disagree, 4. Agree, 5. Strongly agree

F. I feel confident suggesting using condoms with a new partner because I would not be afraid he or she would think I have a sexually transmitted diseases.

1. Strongly disagree, 2. disagree, 3. Neither agree nor disagree, 4. Agree, 5. Strongly agree

G. I feel confident suggesting using condoms with a new partner because I would not be afraid he/she would think I thought they had sexually transmitted diseases.

1. Strongly disagree, 2. disagree, 3. Neither agree nor disagree, 4. Agree, 5. Strongly agree

Factor 3: Intoxicant control

H. I feel confident that I would remember to use a condom even after I have been drinking.

1. Strongly disagree, 2. disagree, 3. Neither agree nor disagree, 4. Agree, 5. Strongly agree

I. I feel confident that I would remember to use condom even if I were high

1. Strongly disagree, 2. disagree, 3. Neither agree nor disagree, 4. Agree, 5. Strongly agree

9. Parental monitoring:

Please provide a correct answer about your parent (father/mother) or legal guardian monitoring of your activities.

9.1 Adolescent monitoring by father

- a. My father knows my whereabouts, friends, and activities: 0 =No; Yes =1.
- b. My father regularly supervises of my activities: 0 = No; 1 = Yes.
- c. I openly disclose information to my father: 0 = No; 1 = Yes
- d. I openly discuss sexual matters with my father: 0 = No; 1 = Yes.
- e. My father often controls and limits my freedom: 0 = No; 1 = yes.

9.2 Adolescent monitoring by mother

- a. My mother knows my whereabouts, friends, and activities: 0 =No; Yes =1.
- b. My mother regularly supervises of my activities: 0 = No; 1= Yes.
- c. I openly disclose information to my mother: 0 = No; 1 = Yes.
- d. I openly discuss sexual matters with my father: 0 = No; 1 = Yes.
- e. My father often controls and limits my freedom: 0 = No; 1 = yes.

10. Religious affiliation of the student: 1 = Protestant, 2 = Catholic, 3 = Orthodox, 4 = Muslim 5 = other, please specify-----.

11. Participation in religious activities:

11.1. Do you participate in religious activities? 0 = No, 1= yes.

If the answer is yes, please proceed to question 11.2. If the answer is no, please proceed to question 12.

11.2. Frequency of participation in religious activities:

1 = more than once a week, 2 = once a week, 3 = 1-3 times a month, 4 = less than once a month, or never.

12. **Risky sexual behavior:** Have you ever had sexual intercourse? 0 = No; 1 = yes.

If the answer is 'yes', in the last 12 months you had sexual intercourse, did you or your partner consistently use condoms? 0 = yes, 1 = No

13. **Socioeconomic status of the parents:**

13.1: Parental education:

13.1.1. Education status of mother: 1 = unable to read and write, 2 = elementary school, 3 = high school, 4 = college graduate and above.

13.1.2. Education status of father: 1 = unable to read and write, 2 = elementary school, 3 = high school, 4 = college graduate and above.

13.2. Socioeconomic status of the parents: Please rate your perceived social economic status of your family: 1 = very poor; 2 = poor, 3 = middle; 4 = rich, 5 = very rich.

Thank you for participating in this research

Appendix B: ቃለመጠይቅ (የአማርኛ ትርጉም)

መግቢያ

1. ግዛቸው ከበደ እባላለሁ፣ በዋልደን ዩኒቨርሲቲ በሕብረተሰብ ጤና የፕሮጀክቶች ስልጠና ይከተሉ ነኝ። በሕብረተሰብ ጤና ፍልስፍና ዶክትሬት ትምህርቴን ለማጠናቀቅ ይህንን ምርምር እንደ ማሟያ እየሠራሁ ነው።
2. ከ30-45 ደቂቃዎች ብቻ ሊቆይ የሚችል በራስ የሚሞላ መጠይቅ ለመሙላት ጊዜ ስለወሰዱ አድናቆቴን መግለጽ እወዳለሁ።
3. የዚህ ጥናት ዓላማ በትምህርት ቤት የሚገኙ ወጣቶች ለኤች.አይ.ቪ ያላቸው ተጋላጭነትን ከፍ የሚያደርጉ አደገኛ ሁኔታዎችን መገምገም እና በትምህርት ቤት እና በማህበረሰቡ ውስጥ የኤች.አይ.ቪ መከላከል ሥራን ለመስራት እንዲቻል የኤች.አይ.ቪ ኤድስ መከላከል እና ቁጥጥር ተግባራትን ለማጠናከር የጥናቱን ግኝቶች መጠቀም ነው።
4. ከጥናቱ ተሳታፊዎች የተሰበሰበው መረጃ ሥም የማይጠቀስበት እና ሚስጥራዊ ተደርጎ የሚያዘ ይሆናል። የተማሪዎችን ማንነት የሚለይ ማንኛውም መረጃ እንደማይሰበሰብ አረጋግጣለሁ።
5. የምርምር ተሳታፊዎች ከዚህ ጥናት በማንኛውም ጊዜ የመውጣት መብት አላቸው። ተሳታፊዎች በተሰራጨው የስምምነት ቅጽ ከፈረሙ በኋላ በመረጃ አሰባሰቡ ቀን በምርምሩ ለመሳተፍ የመመለስ መብት አላቸው።
6. የወደፊት ተመራማሪዎች እንደመሆናችሁ፣ ለምርምር ጥራት አስተዋፅዖ የሚያደርጉ እና የጥናት ዓላማን ለማሳካት ለሚረዱ ሁሉም የምርምር ጥያቄዎች ትክክለኛውን መልስ በመስጠት ሐቀኛ እና ምክንያታዊ መሆን ይጠበቅባችኋል።
7. ማንኛውንም የፅንሰ-ሀሳብ ማብራሪያ ሲፈልጉ እባክዎን አስተባባሪዎቼን ይጠይቁ።

አጠቃላይ መረጃ

የተማሪው መለያ ----- የመማሪያ ክፍል ወረዳ..... ዞን ክልል

..... ሀገር

ለሚከተሉት ጥያቄዎች ትክክለኛውን መልስ እባክዎ በተሰጠው ክፍት ቦታ ይሙሉ

የተማሪው ዕድሜ (ዕድሜ በዓመት):-

የትውልድ ቀን (ቀ/ወ/ዓዓ): ---- / ---- / ----

ይታ: 0 = ወንድ፣ 1 = ሴት

የትምህርት ደረጃ: 1 = 9ኛ፣ 2 = 10ኛ፣ 3 = 11ኛ፣ 4 = 12ኛ

ብሔረሰብ: 1 = ከምባታ፣ 2 = ሀዲያ፣ 3 = አማራ፣ 4 = ሌላ። እባክዎን ይግለጹ-----

የመኖሪያ ቦታ: 1 = ገጠር፣ 2 = ከተማ

ሁሉን አቀፍ የኤች አይ ቪ እውቀት

ለሚከተሉት የኤች አይ ቪ እውቀት እና ከእምነት ጋር ለተያያዙ ጥያቄዎች እባክዎን ትክክለኛውን መልስ እንደ ለመሆን፣ ለአይደለም ወይም አላውቅም በማለት ይምረጡ።

7.1፡ ኤች አይ ቪን በሚከተሉት መከላከል ይቻላል፡

ሀ. ከጋብቻ በፊት ከግብረ ሥጋ ግንኙነትን መታቀብ 0 = አይደለም፤ 1 = አዎ፤ 2 = አላውቅም

ለ. ታማኝ አንድ ዳደኛ ብቻ በመያዝ 0 = አይደለም፤ 1 = አዎ፤ 2 = አላውቅም

ሐ. ኮንዶምን ሁልጊዜ መጠቀም 0 = አይደለም፤ 1 = አዎ፤ 2 = አላውቅም

ስለ ኤች አይ ቪ ስርጭት ያሉ እምነቶች

ሀ. ጤናማ የሚመስል ሰው ኤች አይ ቪ ሊኖርበት አይችልም፡ 0 = አይደለም፤ 1 = አዎ፤ 2 = አላውቅም

ለ. ኤች አይ ቪ በወባ ትንኝ ንክሻ ሊተላለፍ ይችላል፡ 0 = አይደለም፤ 1 = አዎ፤ 2 = አላውቅም

ሐ. ኤች አይ ቪ በፈጣሪ ቁጣ ሊተላለፍ ይችላል -0 = አይደለም፤ 1 = አዎ፤ 2 = አላውቅም

መ. አንድ ሰው ኤች አይ ቪ ካለበት ሰው ጋር ምግብና ሌሎች ነገሮችን በሚጋራበት ጊዜ በኤች አይ ቪ ሊያዝ ይችላል፡ 0 = አይደለም፤ 1 = አዎ፤ 2 = አላውቅም።

ኮንዶምን ለመጠቀም በራስ ችሎታ መተማመን መለኪያ፡

በሚቀጥሉት ዘጠኝ ጥያቄዎች ላይ ስለ ኮንዶም አጠቃቀም በቀረበው ባለ አምስት ነጥብ ሚዛን ላይ የግል ችሎታዎን/እምነትዎን ይገምግሙ።

8.1 ምክንያት 1፡ ሃሳብን በግልጽነት መግለጽ መቻል

ሀ. ከማንኛውም ዳደኛ ጋር ለግብረ ሥጋ ግንኙነት በፊት ስለ ኮንዶም አጠቃቀም ለመወያየት በራሴ እተማመናለሁ

1. ፈጽሞ አልስማማም፤ 2. አልስማማም፤ 3. ገለልተኛ ነኝ፤ 4. እስማማለሁ፤ 5. ፈጽሞ እስማማለሁ

ለ. ከአዲስ ዳደኛ ጋር ከግብረ ሥጋ ግንኙነት በፊት ስለ ኮንዶም አጠቃቀም ሃሳብ ለመስጠት በራሴ እተማመናለሁ

1. ፈጽሞ አልስማማም፤ 2. አልስማማም፤ 3. ገለልተኛ ነኝ፤ 4. እስማማለሁ፤ 5. ፈጽሞ እስማማለሁ

ሐ. ዳደኛዬን ሳላስከፋው ከግብረ ሥጋ ግንኙነት በፊት ኮንዶም እንዲጠቀም ሀሳብ ለማቅረብ/ለማግባባት በራሴ እተማመናለሁ።

1. ፈጽሞ አልስማማም፤ 2. አልስማማም፤ 3. ገለልተኛ ነኝ፤ 4. እስማማለሁ፤ 5. ፈጽሞ እስማማለሁ

መ. የግብረ ሥጋ ግንኙነት በምንፈጽምበት ጊዜ ኮንዶም መጠቀሙን እንዲቀበል ባለኝ አቅም ዳደኛዬን ለማሳመን በራሴ እተማመናለሁ።

1. ፈጽሞ አልስማማም፤ 2. አልስማማም፤ 3. ገለልተኛ ነኝ፤ 4. እስማማለሁ፤ 5. ፈጽሞ እስማማለሁ

8.2 ምክንያት 2፡- በዳደኛ የመተው (ያለመቀበል) ስጋት

ሠ. አዲስ ዳደኛ ኮንዶም እንዲጠቀም ሀሳብ በማቅረቤ በራስ የመተማመን ስሜት ይሰማኛል ምክንያቱም የግብረ ሥጋ ግንኙነት ተሞክሮ አለው/አላት ብሎ ያስባል ብዬ አልሰጋም ወይም አልፈራም።

1. ፈጽሞ አልስማማም፤ 2. አልስማማም፤ 3. ገለልተኛ ነኝ፤ 4. እስማማለሁ፤ 5. ፈጽሞ እስማማለሁ
ረ. ከአዲስ ዳደኛ ጋር ኮንዶም እንዲጠቀም ሀሳብ በማቅረቤ በራስ የመተማመን ስሜት ይሰማኛል ምክንያቱም በጾታ ግንኙነት የሚተላለፉ በሽታዎች አለው/አለባት ብሎ ያስባል ብዬ አልሰጋም ወይም አልፈራም፡፡

1. ፈጽሞ አልስማማም፤ 2. አልስማማም፤ 3. ገለልተኛ ነኝ፤ 4. እስማማለሁ፤ 5. ፈጽሞ እስማማለሁ
ሰ. ከአዲስ ዳደኛ ጋር ኮንዶም እንዲጠቀሙ ሀሳብ በማቅረቤ በራስ የመተማመን ስሜት ይሰማኛል ምክንያቱም በጾታ ግንኙነት የሚተላለፉ በሽታዎች እንደሚኖርባቸው ያስባሉ ብዬ አልሰጋም ወይም አልፈራም፡፡

1. ፈጽሞ አልስማማም፤ 2. አልስማማም፤ 3. ገለልተኛ ነኝ፤ 4. እስማማለሁ፤ 5. ፈጽሞ እስማማለሁ

8.3 ምክንያት 3:- ማናቸውም አነቃቂ መጠጦች ወይም መድሃኒቶች በተወሰዱበት ወቅት የራስን ስሜት መቆጣጠር ሸ. ከጠጣሁ በኋላም ቢሆን ከግብረ ሥጋ ግንኙነት በፊት ኮንዶም መጠቀሙን እንደማስታውስ በራስ እተማመናሁ፡፡

1. ፈጽሞ አልስማማም፤ 2. አልስማማም፤ 3. ገለልተኛ ነኝ፤ 4. እስማማለሁ፤ 5. ፈጽሞ እስማማለሁ
ቀ. በከፍተኛ የወሲብ ፍላጎት ውስጥ ሆኜ እንኳን ኮንዶም መጠቀሙን እንደማስታውስ በራስ እተማመናለሁ

1. ፈጽሞ አልስማማም፤ 2. አልስማማም፤ 3. ገለልተኛ ነኝ፤ 4. እስማማለሁ፤ 5. ፈጽሞ እስማማለሁ
የወላጅ ክትትል

እባክዎን ስለ ወላጅዎ (አባት/እናት) ወይም ስለ ሕጋዊ ሞግዚት ቁጥጥር ትክክለኛ መልስ ይሰጡ፡፡

9.1 በጉርምስና ዕድሜ ላይ የሚገኝ ወጣት ክትትል በአባት

ሀ. አባቴ የምውልበትን ቦታ፣ ዳደኞቼን እና እንቅስቃሴዎቼን ያውቃል 0 = አይደለም፤ አዎ = 1.

ለ. አባቴ እንቅስቃሴዎቼን በመደበኛነት ይቆጣጠራል 0 = አይደለም፤ 1 = አዎ፡፡

ሐ. እኔ ስለውሎዬ እና ዳደኞቼ መረጃን ለአባቴ በግልጽ አሳውቃለሁ : 0 = አይደለም፤ 1 = አዎ

መ. ከአባቴ ጋር ከግብረ ሥጋ ግንኙነት ጋር የተያያዙ ጉዳዮች በግልፅ እንወያያለን : 0 = አይደለም፤ 1 = አዎ፡፡

ሠ. አባቴ ብዙውን ጊዜ ነፃነቴን ይቆጣጠራል እንዲሁም ይገድባል 0 = አይደለም፤ 1 = አዎ

9.2 በጉርምስና ዕድሜ ላይ የሚገኝ ወጣት ክትትል በእናት

ሀ. እናቴ የምውልበትን ቦታ፣ ዳደኞቼን እና እንቅስቃሴዎቼን ታውቃለች 0 = አይደለም፤ አዎ = 1.

ለ. እናቴ ዘወትር እንቅስቃሴዎቼን ትቆጣጠራለች: 0 = አይደለም፤ 1 = አዎ፡፡

ሐ. ለእናቴ ስለውሎዬ እና ዳደኞቼ መረጃን በግልፅ አሳውቃለሁ: 0 = አይደለም፤ 1 = አዎ፡፡

መ. ከእናቴ ጋር ስለ ስነጾታ ጉዳዮች በግልፅ እወያያለሁ 0 = አይደለም፤ 1 = አዎ፡፡

ሠ. እናቴ ብዙውን ጊዜ ነፃነቴን ይቆጣጠራል እንዲሁም ይገድባል 0 = አይደለም፤ 1 = አዎ

የተማሪው ሃይማኖት -1 = ፕሮቴስታንት፣ 2 = ካቶሊክ፣ 3 = ኦርቶዶክስ፣ 4 = ሙስሊም 5=ሌላ፣ እባክዎን

ይፃፉት-----

11. በሃይማኖታዊ መርሃ ግብር ውስጥ ስለሚኖር ተሳትፎ-

11.1. በሃይማኖታዊ መርሃ ግብሮች ውስጥ ይሳተፋሉ? 0 = አይደለም፣ 1 = አዎ።

መልስዎ አዎ ከሆነ እባክዎን ወደ ጥያቄ 11.2 ይቀጥሉ። መልስዎ አይደለም ከሆነ እባክዎን ወደ ጥያቄ 11 ይቀጥሉ።

11.2 በሃይማኖታዊ እንቅስቃሴዎች ውስጥ የተሳትፎ ድግግሞሽ-

1 = በሳምንት ከአንድ ጊዜ በላይ፣ 2 = በሳምንት አንድ ጊዜ፣ በወር 3 = በወር 1-3 ጊዜ፣ 4 = በወር ከአንድ ጊዜ ያነሰ፣ ወይም በጭራሽ።

12 . ለአደጋ የሚያጋልጥ የግብረ ሥጋ ግንኙነት ባሕሪ፡- የግብረ ሥጋ ግንኙነት ፈጽመው ያውቃሉ? 0 = አይደለም፣ 1 = አዎ

መልስዎ ‘አዎ’ ከሆነ ባለፉት 12 ወራት ውስጥ የግብረ ሥጋ ግንኙነት በፈጸሙበት ወቅት፣ እርስዎ ወይም ጓደኛዎ ያለማቋረጥ ኮንዶም ይጠቀሙ ነበር? 0 = አይደለም፣ 1 = አዎ።

13. የወላጆች ማህበራዊ ኢኮኖሚያዊ ሁኔታ

13.1 የወላጅ ትምህርት፡

13.1.1 የእናት የትምህርት ደረጃ፣ 1 = ማንበብ እና መጻፍ የማይችሉ፣ 2 = የመጀመሪያ ደረጃ ትምህርት፣ 3 = ሁለተኛ ደረጃ፣ 4 = የኮሌጅ ምሩቅ እና ከዚያ በላይ።

13.2.2 የአባት የትምህርት ደረጃ፣ 1 = ማንበብ እና መጻፍ የማይችሉ፣ 2 = የመጀመሪያ ደረጃ ትምህርት፣ 3 = ሁለተኛ ደረጃ፣ 4 = የኮሌጅ ምሩቅ እና ከዚያ በላይ።

13.2 የወላጆች ማህበራዊ ኢኮኖሚያዊ ሁኔታ፡- እባክዎን በቤተሰብዎ ውስጥ የተገነዘቡትን ማህበራዊና ኢኮኖሚያዊ ደረጃ ይገምግሙ

1 = በጣም ድሃ፣ 2 = ድሃ፣ 3 = መካከለኛ፣ 4 = ሀብታም፣ 5 = በጣም ሀብታም።

በዚህ ምርምር ስለተሳተፉ በጣም አመሰግናለሁ።

Appendix C: Permission from SNNPRS Regional Health Bureau



የደቡብ ብሄሮች ብሔረሰቦችና ሕዝቦች ክልላዊ
መንግሥት ጤና ቢሮ

South Nations Nationalities and Peoples' Regional
State Health Bureau

ቁጥር የሙ/3/041
Ref. No
ቀን 01/11/2013
Date

Gizachew Kebede Bassore

Walden University

Subject: **Support letter**

You have submitted your PhD dissertation proposal protocol on "Predictors of HIV-Related risky behaviors among high school students: socioecological perspective" with study tools and consent forms (both English and Amharic version) and also applied for support letter. We received your submissions and reviewed it, and we believe that the study can help/assist the specified program, HIV/AIDS response, and can fill information gaps in the study area (Angecha senior secondary school, Angecha district).

Hence, we provide you this support letter and wish successful completion of the study. In addition, be informed that we have written support letter to the study zone, in Amharic.

Best regards,


ምስኪን ገሰደርያን ታንቲህ
Misganu Edrias Tantuy
የጤና ምርምርና ቴክኖሎጂ ለውጥ
ዳይሬክቶሬት
**Health Research & Technology
Transfer Directorate Director**



CC

Health Research and Technology Transfer Directorate

RHB

