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HIV/AIDS Knowledge among Secondary School Students in Tanzania: A Case of Misungwi District in Mwanza Region

Malale Tungu[1]*, Maginya S. Mpuya[3], Novatus A. Tesha[1], Heavenlight A. Paulo[2], Alphoncina Kagaigai[1], Francis August[1]

[1]Department of Development Studies, School of Public Health and Social Sciences, Muhimbili University of Health and Allied Sciences, Dar es Salaam, Tanzania
[2]Department of Epidemiology and Biostatistics, School of Public Health and Social Sciences, Muhimbili University of Health and Allied Sciences, Dar es Salaam, Tanzania
[3]Mbeya District Council, Mbeya, Tanzania

***Corresponding author:**

Dr Malale Tungu

Muhimbili University of Health and Allied Sciences

P. O. Box 65001

Dar es Salaam, Tanzania

Email: malaletungu@gmail.com

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Abstract

Background

Based on the latest UNAIDS report on the global AIDS epidemic; about 34 million people worldwide are estimated to live with HIV and about 69% are found in Sub-Saharan Africa. In Tanzania, people living with HIV/AIDS are estimated to be 1.6 million, of which, 1.3 million belong to the age of 15 years and above.

This study aimed to assess the general knowledge on HIV/AIDS among secondary school students in the Misungwi district.

Methods

A cross-sectional study design was employed involving 330 students. Information concerning knowledge on causes, risk factors, transmission routes, signs and symptoms as well as preventive measures of HIV/AIDS was collected using a self-assessment structured questionnaire. Data were analyzed using STATA. Mean and standard deviation summarized the numerical variables. Categorical variables were summarized using frequency and proportions. A linear regression model was used to determine the relationships between knowledge score and exposure variables. Multivariable were used to control for confounders. The significance level was set at 5%.

Results

Majority of students had the age of 16 – 18 years old. Males were 64% of the sample. The study found that age, sex and level of classes had influence on the knowledge on symptoms, risk factors and general knowledge about HIV/AIDS. Age appeared to influence HIV symptoms, risk factors and general knowledge ($p<0.05$). Age was negatively associated with knowledge.

Conclusion

The study found that age, sex and school grade influence the general knowledge on HIV/AIDS, its symptoms and risk factors. Therefore, stakeholders should continue providing education on HIV to the youth of all ages and sex.

Key words: *HIV, AIDS, Secondary School, Knowledge, Symptoms, Risk factors.*

Introduction

Human Immunodeficiency Virus (HIV) infection continues to be a major global public health problem and it's among the fastest-growing epidemic in the world. About one hundred million people in the world are living with HIV and more than half of them are youth between the age of 12- 30 years (1). Among them, about 11.8 million are aged between 15 to 24 years of which, nearly 6,000 of them are infected with HIV per day. Yet not all of them know their HIV status and thus tend to compromise global efforts to achieve 95-95-95 intervention (2). Acquired Immunodeficiency Syndrome (AIDS) was first described in the USA in 1981 and the HIV was first microscopically identified by the end of 1983. In Tanzania, the first case of AIDS was identified in 1983 in the Kagera region. Since then, HIV/AIDS has been a pandemic expanding in scope and magnitude (3). This is because, among other things, of the high sexual desire of the youths. Many people are dying of AIDS-related illnesses. In 2013 there were 1.5 million (1.4 million–1.7 million) AIDS-related deaths in Sub-Saharan Africa (4,5). The number of people living with HIV in Tanzania increased from 1.3 million in 2010 to 1.7 million in 2019, while deaths associated with AIDS decreased from 52,000 in 2010 to 27,000 in 2019 and 5,900 deaths are among children from 0-14 years old (4–6). Globally, AIDS-related deaths have fallen by 35% since 2005, when the highest number of deaths was recorded. In Sub-Saharan Africa, the number of AIDS-related deaths fell by 39% between 2005 and 2013. However, the region still accounted for 74% of all people dying from AIDS-related causes in 2013 (7). In Tanzania the prevalence of HIV decreased from 7.5% in 1997 to 4.5% in 2021 (1). The prevalence in age group of 15-45 years old which includes adolescents in the country decreased from 5.1% in 2014 to 4.8% in 2019 (5,6).

Various studies in the country have shown that, the age group of pupils in standards six and seven are sexually active. It has been reported that the age at first intercourse is below 11 years (8). A survey done in Mwanza on Sexual and Reproductive Health among Primary and Secondary School Students showed that 80% of boys and 63% of girls have been sexually active. This puts them at risk of contracting HIV/AIDS and other sexually transmitted diseases (STDs). The same survey showed that, 33% of boys and 25% of girls had past STDs experiences (9). This could be due to their limited knowledge about HIV/AIDs as studies across the globe show that the vast majority of youths have no idea on how HIV/AIDS is transmitted and protect themselves from the disease. Adolescent girls and young women account for one in four new HIV infections in Sub-Saharan Africa (2).

Since 2000, various global declarations and commitments with specific goals and targets have been made and set by the world leaders and governments to respond to HIV/AIDS

epidemic. Although these global commitments, goals and targets are relevant for adolescents, the implications and accountabilities are rarely specific to this age group. In addition, adolescent-specific data that could give the general information on this age group that is inclusive to those at and not at school are limited. As a result, compared with infants and adults, less is known about the burden of HIV and AIDS among adolescents and progress to date in addressing their needs for HIV prevention, care, and treatment services (10).

Good knowledge about HIV/AIDS among secondary school students is the tool for combating the problem. Studies conducted in Sub-Saharan countries and Tanzania, in particular, show that students have awareness of HIV/AIDS especially on the causes of HIV/AIDS, signs and symptoms, risk factors associated with its transmission mechanism and preventive measures.

Most of the studies conducted were based on secondary schools that were located in urban settings with few of the studies being conducted in rural settings (11–13). Therefore, there is no clear knowledge that can be wholly applied in Sub-Saharan countries. Moreover, these studies dealt with awareness, attitude and perception of HIV/AIDS among Secondary school students without including general knowledge on symptoms, risk factors and transmission.

This gap, therefore, necessitated carrying out this study on secondary school students in rural areas schools as an attempt to fill the gap on the missing information about the rural community. It provides information that helps to inform the government plans particularly those of the Ministry of Education on setting secondary school curriculum on HIV/AIDS education. This study aimed to assess the knowledge of the secondary school students on HIV/AIDS in Misungwi district in Mwanza Region.

Methods

Study Setting

This study was conducted in Misungwi District in the Mwanza region. According to the 2012 Tanzanian Population and Housing Census, the population of the District was 351,607 of which males were 173,997(49.49%) and females were 177,610(50.51%) (14). Administratively, Misungwi is divided into four divisions and 27 wards. There are 27 Ordinary level secondary schools of which 23 are owned by the Government and 4 by private. This district was an appropriate district for the study because it is one of the districts with the highest HIV prevalence (5.6%) in Mwanza after Kwimba (6.1%) (15).

Study design, sampling techniques and sample size

This was a cross-sectional study design that involved a total of 330 respondents in Miswingwi district. This study involved form three and four secondary school students in the district. A multistage cluster sampling technique was used to select five secondary schools. In each secondary school, a lottery method was used to select the average of 74 students who were enrolled as respondents of the study. Respondents were selected based on the total number of students in each school. Data were collected using a structured self-assessment questionnairethat was developed based on the research objective and was translated into the Swahili language. All questions were re-checked after the pilot study and the necessary changes in the tools were made. The questionnaire consisted of 5 sections that include socio-demographic characteristics, assessment of knowledge on symptoms, risk factors, transmission and general knowledge on HIV/AIDS. The sample size was calculated from the formula

$$n = \frac{Z^2 P(100 - P)}{\varepsilon^2}$$

*n= [1.96^2 *83.5(100-83.5)]/4^2 =330.*

Whereby n= sample size, Z= 1.96 standard normal deviation for 95% confident interval, P= proportion from previous studies that is 83.5%, Ɛ= margin of error set at 4% (0.04).

Study Variables

The outcome variable and HIV knowledge scores were derived from four separate measures: HIV knowledge of symptoms, HIV knowledge of risk factors, HIV knowledge of transmission, and overall HIV knowledge. For each measure, a score of 1 was assigned to respondents who answered correctly, while those who answered incorrectly received a score of 0. The independent variables of this study were age, sex and classes of study.

Data Processing and Analysis

Data entry and cleaning were done using SPSS version 20 and data analysis was done using STATA version 15.0. Categorical variables were summarized using frequency and proportions. Continuous variables were tested for normality using histogram and summarized using mean and standard deviation. Independent two-sample t-test and one-way analysis of variance (ANOVA) were used to compare mean knowledge scores between groups. A linear regression model was used to determine linear relationships between knowledge score and exposure variables (age, sex, and class of the study). All linear

regression assumptions including a test for normality, a test for heteroscedasticity, and a linearity test were conducted before regression analysis. Multiple linear regression was used to control confounders. The significance level was set at 5%.

Results

Socio-demographic characteristics

Table 1 presents the demographic characteristics of the respondents involved in the study. The study enrolled 330 participants of which 75% were aged between 16-18 and less than 1% were aged between 13-15 and 22-24, the rest were aged between 19-21 years of age. About 65% were male and 62% were in form three class.

Table 1: Respondents background characteristics (N=330)

Variable	Frequency	Percentage
Age (in years)		
13-15	3	0.9
16-18	249	75.5
19-21	75	22.7
22-24	3	0.9
Sex		
Female	117	35.5
Male	213	64.6
Classes of study		
Form three	205	62.1
Form four	125	37.9

Knowledge on causes, risk factors, and ways of transmission of HIV/AIDS

Table 2 presents the linear regression analysis that assessed the knowledge of students on symptoms, risk factors, and the transmission of HIV/AIDS. Results showed that the age and sex of the students influenced the knowledge about symptoms of HIV/AIDS both crude and adjusted analysis. On the knowledge about risk factors of HIV/AIDS, only the level of classes influenced both crude and adjusted analysis. The explanatory variables did not influence the knowledge about transmission of HIV/AIDS for both crude and adjusted analysis.

Table 2: Effects of age, sex and class level on the knowledge about the symptoms, risk factors and transmission of HIV/AIDS

	Mean (SD)	Crude		Adjusted	
Symptoms		**Coef (95% CI)**	**p-value**	**Coef (95% CI)**	***p-value***
Age (in years)					
15 and below	8.3(0.6)	1		1	
16-18	7.3(1.9)	-1.02(-1.61, -0.45)	<0.01	-1.00(-1.55, -0.45)	<0.01
19-21	7.1(2.0)	-1.28(-1.98, -0.58)	<0.01	-1.19(-1.88, -0.51)	<0.01
22 and above	7.0(2.0)	-1.33(-3.28, 0.61)	0.18	-1.31(-3.30, 0.68)	0.20
	F3,326=0.71, p=0.55				
Sex					
Female	7.6(1.7)	1			
Male	7.1(1.9)	-0.53(-0.93, -0.12)	0.01	-0.53(-0.93, -0.12)	0.01
	t_{328}*=2.48, p=0.01*				
Classes of study					
Form three	7.2(1.9)	1			
Form four	7.4(1.8)	0.20(-0.21, 0.62)	0.33	0.33(-0.09, 0.74)	0.12
	t_{328}*=-0.96, p=0.34*				
Risk Factors					
Age (in years)					
15 and below	15.0(1.7)	1			
16-18	13.7(2.2)	-1.28(-2.92, 0.36)	0.13	-1.55(-3.13, 0.02)	0.05
19-21	13.9(2.3)	-1.12(-2.82, 0.58)	0.20	-1.56(-3.23, 0.10)	0.07
22 and above	13.0(1.7)	-2.00(-4.29, 0.29)	0.09	-2.79(-5.09, -0.48)	0.02
	F3,326=0.53, p=0.66				
Sex					
Female	13.5(2.5)	1			
Male	13.9(2.0)	0.38(-0.15, 0.90)	0.16	0.33(-0.20, 0.86)	0.22
	t_{328}*=-1.48, p=0.14*				

Classes of study					
Form three	13.6(2.2)	1			
Form four	14.1(2.1)	0.56(0.08, 1.04)	0.02	0.57(0.05, 1.09)	0.03
	t_{328}=-2.26,				
	p=0.02				
Transmission					
Age (in years)					
15 and below	5.7(0.6)	1		1	
16-18	5.5(0.8)	-0.20(-0.75, 0.34)	0.46	-0.25(-0.79, 0.30)	0.38
19-21	5.5(0.8)	-0.19(-0.75, 0.38)	0.52	-0.25(-0.82, 0.32)	0.39
22 and above	5.0(1.0)	-0.67(-1.74, 0.41)	0.22	-0.78(-1.88, 0.31)	0.16
	F3,326=0.44,				
	p=0.73				
Sex					
Female	5.4(0.8)	1		1	
Male	5.5(0.7)	0.04(-0.14, 0.22)	0.64	0.04(-0.14, 022)	0.45
	t_{328}=-0.48,				
	p=0.63				
Classes of study					
Form three	5.4(0.8)	1			
Form four	5.5(0.7)	0.08(-0.09, 0.24)	0.35	0.09(-0.08, 0.26)	0.30
	t_{328}=-0.89,				
	p=0.38				

Table 3 presents the linear regression analysis that assessed the overall knowledge of students of HIV/AIDS. Age and level of classes (crude and adjusted) influenced the overall knowledge of HIV/AIDS as indicated in table 3. The study found that there is a significant difference in mean HIV knowledge score on symptoms between male and female students. Similarly, the finding shows that general HIV knowledge differs between class levels and sex. Female students had a high mean knowledge score on HIV symptoms compared with male students (p=0.01). Standard four had a high mean knowledge score on risk factors of HIV compared to standard four students (p=0.02) as well as total knowledge on HIV (p=0.03).

Table 3: Effects of age, sex and class level on the overall knowledge of HIV/AIDS

Knowledge on HIV/AIDS					
Age (in years)					
15 and below	29.0(1.0)	1			
16-18	26.5(3.3)	-2.51(-3.53, -1.48)	<0.01	-2.80(-3.95, -1.65)	<0.01
19-21	26.4(3.5)	-2.59(-3.81, -1.36)	<0.01	-3.01(-4.39, -1.63)	<0.01
22 and above	25.0(1.7)	-4.00(-5.87, -2.13)	<0.01	-4.88(-6.98, -2.78)	<0.01
	F3,326=0.78, p=0.51				
Sex					
Female	26.6(3.6)	1			
Male	26.4(3.2)	-0.11(-0.89, 0.67)	0.78	-0.16(-0.94, 0.62)	0.69
	t_{328}*=0.28, p=0.78*				
Classes of study					
Form three	26.2(3.4)	1			
Form four	27.0(3.2)	0.84(0.11, 1.57)	0.02	0.98(0.22, 1.75)	0.01
	t_{328}*=-2.24, p=0.03*				

Discussion

This study underlined whether secondary school students had enough knowledge on HIV/AIDS in terms of symptoms, risk factors and transmission. The aim was to inform policymakers and curriculum developers on knowledge of HIV/AIDS among this group. This study found age, sex and level of classes influenced the knowledge on symptoms, risk factors and general knowledge about HIV/AIDS. Age appeared to influence HIV symptoms, risk factors and general knowledge. Surprisingly, age was negatively associated with knowledge. As age increases, the level of knowledge about HIV symptoms, risk and transmission decreases. We speculate that students who start school at a late age could have little understanding in class. This might be because they come from poor families in rural areas where language barrier is high. In Tanzania, there are many local languages used in communities apart from the two national languages (English and Swahili). On the other hand, they have no access to social media, TV and radios where they can get health education including knowledge on HIV/AIDS. However, most students who are enrolled in

school at the right age are from urban areas where there is access to social media, TV and radios. Findings are consistent with a study done in Malaysia (16) where it was found that lower age was associated with high knowledge scores. In contrary to the study done in Cameroon (17) which found that there were no significant differences across ages. Another study was done in Iraq (18) and found an association between high knowledge score about HIV/AIDS with older age.

The study found that females had high knowledge of HIV symptoms compared with male students. This could be due to differences in study areas and time. Girls are exposed to different pieces of training than males such as reproductive education and health education campaigns. The findings contradict other findings from Tanzania and elsewhere (13,16,19) which reported the same level of HIV knowledge among male and female students. Another study was done in Iraq (18) and found that there is an association between high knowledge scores about HIV/AIDS and male students.

General knowledge on HIV/AIDS was high among the form four students compared to form three students. This indicates that an increase in the level of classes has a high contribution to the increase of knowledge about HIV/AIDS. Similar findings were done in Tanzania and China (20,21) found that senior students were more knowledgeable on HIV/AIDS than junior students.

Strength and Limitations

One of the strengths of this study is it can shed light on the level of knowledge on HIV/AIDS to young people and the effectiveness of HIV education campaigns. However, this study cannot be generalized since it was done in one district, whose setting might be different in other areas. In addition, this is a cross-sectional study that cannot capture the causality of the factors associated with knowledge on HIV/AIDS. This limitation was minimized by including different class levels to capture variation in knowledge on HIV/AIDS to these groups.

Conclusion

Generally, the study found that secondary school students are knowledgeable on HIV/AIDS symptoms, risk factors and transmission. Also, it was found that age, sex and level of classes influence the general knowledge on HIV/AIDS, its symptoms and risk factors. HIV/AIDS stakeholders should continue to provide HIV education to the youth of all ages and sex.

Ethical Consideration

Ethical clearance was obtained from the Muhimbili University of Health and Allied Sciences Senate Research and Publications Committee (2017-08-30/AEC/Vol.XII/109). Permission for field data collection was granted by the District Executive Directors of Misungwi districts. Respondents were duly informed of the purpose of the survey and their rights. Individual consent was obtained from each respondent from the Misungwi districts before the survey. Written consent was obtained from all participants. At the school level, the heads of schools of each school where the study was conducted were informed about the study aims and the data collection procedures, permission was sought and given.

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Declaration of Conflicting Interests

Authors declare no potential conflicts of interest concerning the research, authorship, and/or publication of this article.

Authors' contributions

MT and MSM conceived the study and participated in its design, collected data, analyzed data and drafted the manuscript. NAT, HAP, AK and FA participated in the design, analysis and drafting of manuscript. The authors read and approved the final manuscript.

Abbreviations

AART	Active Antiretroviral Therapy
AIDS	Acquired Immunodeficiency Syndrome
HIV	Human Immunodeficiency Virus
ICT	Information and Communication Technology
MUHAS	Muhimbili University of Health and Allied Sciences
MTCT	Mother to Child Transmission
PMTCT	Prevention of Mother to Child Transmission
SPSS	Statistical Package for the Social Science
STDs	Sexually Transmitted Diseases
UNAIDS	United Nations program on AIDS

References

1. Qin Yongsong OANJ. Knowledge , Attitude and Practices of HIV / AIDS among High School Students in Eastern Cape , South Africa. 2016;(January).
2. Millage A. Young People and HIV/AIDS: Opportunity in Crisis. Intern Audit. 2009;65(3):1–28.
3. Kamala B a B. Knowledge , Attitudes and Practices on Hiv Prevention Among Secondary School Students in Bukoba Rural ,. Dar es Salaam Med Students J. 2006;14(1):14–8.
4. Amour MA, Shayo GA, Matee MM, Machumi L, Rugarabamu A, Aris EA, et al. Predictors of mortality among adolescents and young adults living with HIV on antiretroviral therapy in Dar es Salaam, Tanzania: a retrospective cohort study. J Int AIDS Soc. 2022;25(2):1–8.
5. NACP. Tanzania Hiv Impact Survey (This) 2016-2017. Tanzania HIV Impact Surv 2016-2017 [Internet]. 2018;(December 2017):2016–7. Available from: http://www.nbs.go.tz/nbs/takwimu/this2016-17/Tanzania_SummarySheet_English.pdf
6. UNICEF. AIDS HIV and AIDS. New HIV Infect among young people aged 15–24 years [Internet]. 2020;1–6. Available from: https://www.unicef.org/tanzania/media/2436/file/HIV Programme Fact Sheet.pdf
7. UNAIDS. The gap report. 2014.
8. Oyo-Ita AE, Ikpeme BM, Etokidem AJ, Offor JB, Okokon EO, Etuk SJ. Knowledge of HIV/AIDS among secondary school adolescents in Calabar - Nigeria. Ann Afr Med. 2005;4(1):2–6.
9. Kigombola A, Md GG. Knowledge , Attitude and Practices on HIV / AIDS , its Transmission and Prevention among Primary School Pupils in Rural Kisarawe. 2007;14(2):48–51.
10. Idele P, Gillespie A, Porth T, Suzuki C, Mahy M, Kasedde S, et al. Epidemiology of HIV and AIDS Among Adolescents : Current Status , Inequities , and Data Gaps. 2014;66:144–53.
11. Said H. Kapiga GN and DJH. Knowledge of AIDS among secondary school pupils in Bagamoyo and Dar es Salaam, Tanzania.
12. Kaale G, Muhanga M. Sexual health knowledge among secondary school students in Morogoro, Tanzania: half full or full empty? Int J Heal. 2017;5(2):120.
13. Kamala B., Aboud S. Knowledge, attitudes and practices on HIV prevention among secondary school students in Bukoba rural, Kagera region- Tanzania. Dar Es Salaam Med Students' J. 2010;14(1):14–8.

14. National Bureau of Statistics (NBS) [Tanzania], Office of Chief Government Statistician [Zanzibar]. 2012 POPULATION AND HOUSING CENSUS: Population Distribution by Administrative Areas. 2013;
15. UNADIS. United Republic of Developing Estimates of Hiv Prevalence and the Number of People. 2014;24.
16. Talwar P, Rahman MFBA. Assessment of HIV knowledge among university students using the HIV-KQ-18 scale: A cross-sectional study. South East Asia J Public Heal. 2015;5(1):33–8.
17. Nubed CK, Akoachere JFTK. Knowledge, attitudes and practices regarding HIV/AIDS among senior secondary school students in Fako Division, South West Region, Cameroon. BMC Public Health [Internet]. 2016;16(1):1–10. Available from: http://dx.doi.org/10.1186/s12889-016-3516-9
18. Othman SM. Knowledge about HIV/AIDS among high school students in Erbil city/Iraq. Glob J Health Sci. 2015;7(1):16–23.
19. Shamu S, Khupakonke S, Farirai T, Slabbert J, Chidarikire T, Guloba G, et al. Knowledge, attitudes and practices of young adults towards HIV prevention: An analysis of baseline data from a community-based HIV prevention intervention study in two high HIV burden districts, South Africa. BMC Public Health. 2020;20(1):1–10.
20. Rushahu BG. Assessment of HIV/AIDS and Life Skills Delivery in Primary Schools in Tanzania. World J Educ. 2015;5(1):131–43.
21. Arabia S, Alotaibi SM, Alabbas FF, Almoshadq AF, Pacha MS, Alghamdi MK. AIDS & Clinical Research Knowledge and Perceptions of HIV / AIDS among High School Students in Jeddah, Saudi Arabia. 2016;7(8).