PREVALENCE AND FACTORS ASSOCIATED WITH HIV SELF-TESTING UPTAKE AMONG ADOLESCENT GIRLS AND YOUNG WOMEN IN MIDDLE LEARNING INSTITUTIONS IN DODOMA CITY TANZANIA, 2024.A CROSS-SECTIONAL STUDY

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MSc Applied Epidemiology Dissertation
Muhimbili University of Health and Allied Sciences
October, 2024

Muhimbili University of Health and Allied Sciences

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By

David John Osima (MD)

Dissertation Submitted in Partial Fulfilment of the Requirements for the Degree of Master of Science in Applied Epidemiology of Muhimbili University of Health and Allied Sciences

October, 2024

CERTIFICATION

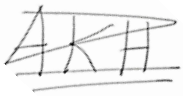
The undersigned certify that they have read and hereby recommend for acceptance of the dissertation entitled Prevalence and Factors Associated with HIV self-testing Uptake among Adolescent Girls and Young Women in Middle Learning Institutions in Dodoma City Tanzania 2024 in partial fulfillment of the requirements for the degree of Master of Science in Applied Epidemiology of Muhimbili University of Health and Allied Sciences**.**



Prof. Billy Ngasala
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31/10/2024

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31/10/2024

Date:

DECLARATION AND COPYRIGHT

I, **David John Osima**, declare that this **dissertation** is my original work and that it has not been presented and will not be presented to any other University for a similar or any other degree award.



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ACKNOWLEDGMENT

The completion of this dissertation was successful through joint efforts by members from Muhimbili University of Health and Allied Science, Tanzania Field Epidemiology and Laboratory Training Program (TFELTP), Centre for Disease Control and Prevention (CDC) through Mzumbe University, and different individuals.

Additionally, I would like to express sincere gratitude to all college principals/Rectors for their support and provision of data for analysis

Furthermore, I am grateful to my supervisor Prof. Billy Ngasala, and co-supervisor Dr Ally Hussein for their technical assistance while conducting this study.

I also convey my appreciation to CDC Mzumbe through TFELTP for the financial support that they provided to ensure this study was successful.

Last but not least, I would like to thank all of my colleagues for their time, contributions, and encouragement during our learning experience.

ABSTRACT

Background

In 2015, globally, around 41,000 adolescent girls and young women died due to AIDS-related illnesses, with less than 20% of them knowing their HIV status in Sub-Saharan Africa. To end the AIDS epidemic by 2030, different strategies are required to address previous challenges and barriers toward achieving the universal goal of ensuring that 95% of the people living with HIV know their status.

The need to study the magnitude, barriers, and determinants associated with HIV self-testing uptake among adolescent girls and young women in middle learning institutions in Dodoma City, Tanzania, is essential.

Methodology

A cross-sectional study was conducted involving middle-level institutions in Dodoma city. Ten colleges were identified, from which five were selected using a two-stage cluster sampling technique. Subsequently, three classes representing years of study mainly year one, year two, and year three were randomly chosen from each selected college, and students were randomly selected from these classes. A modified Poisson regression model with robust standard errors was employed to assess factors independently associated with the use of HIVST. This regression analysis yielded prevalence ratios with a significance threshold of p-value <0.05 and a 95% confidence interval. Information from the participants was collected using a structured questionnaire.

Results.

A total of 771 participants were analyzed, with a mean age of 20.78 years and a standard deviation of 1.85. Among the participants, 360 (46.69%, 95% CI: 43.18%-50.23%) reported having used HIV self-tests.

The identified barriers among those who did not take HIV self-testing were 411(53.31%) includes cultural resistance 392 (95.38%), judgment by healthcare providers 372 (90.51%), legal constraints on kit provision 360 (87.59%), fear of testing procedures 291 (70.80%), test reliability 286 (69.59%), fear of test results 283 (68.86%), accessibility of the HIVST kit 280

(68.13%), fear of others knowing they had tested 273 (66.42%), awareness of HIV self-testing being low 193 (46.96%), and not feeling at risk of HIV infection 73(17.76%).

Socio-demographic factors associated with HIV self-test uptake among adolescent girls and young women AGYW include having multiple sexual partners and studying health-related courses, with adjusted prevalence ratios (aPR) of 1.23 (95% CI: 1.05-1.45) and 1.14 (95% CI: 1.04-1.27), respectively. Other factors showed a two-fold increase in prevalence ratio, including the availability of HIV self-test kits and having testing experience, with aPRs of 2.83 (95% CI: 2.21-3.62) and 2.65 (95% CI: 2.05-3.43), respectively. Feeling at risk of HIV infection was also associated with HIV self-test uptake, with an aPR of 1.29 (95% CI: 1.11-1.50).

Conclusion

The uptake of HIVST among AGYW in Dodoma City falls below 95% of the overall target of HIV awareness among PLWHIV. The following factors influence AGYW to use HIV self-testing: having multiple sexual partners, studying health-related courses, availability of HIV self-testing kits, previous testing experience, increased risk of infection, and feeling at risk of HIV infection. The barriers reported by participants include cultural resistance, being judged by healthcare providers, legal issues that prevent healthcare providers from providing kits to adolescents, and fear of test results. Adolescent girls and young women are at high risk of HIV infection and thus need to know their status.

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ABBREVIATIONS

AGYW	Adolescent Girls and Young Women
AIDS	Acquired Immunodeficiency Deficiency Syndrome
DEFF	Design effect
DREAMS	Determined, Resilient, Empowered, Aids-Free, Mentored and Safe
EECA	Eastern, European, and Central Asian Countries
HCP	Health Care Provider
HIV	Human Immuno-deficiency Virus
HIVST	Human Immuno-deficiency virus self-testing
KP	Key Population
NASHCoP	National Aids, Sexual Transmitted Infection and Hepatitis Control Program
PEPFAR	President's Emergency Plan for AIDS Relief
PI	Principal Investigator
PITC	Patient Initiated Testing and Counselling
PLWHIV	People Living with HIV
TFELTP	Tanzania Field Epidemiology and Laboratory Training Program
UNAIDS	United Nations Program on HIV/AIDS
VCT	Voluntary counseling and Testing
WHO	World Health Organization

DEFINITIONS OF TERMS.

Words	Definitions
HIVST	is a process in which a person collects his or her specimen (oral fluid or blood) and then performs an HIV test and interprets the result, often in a private setting, either alone or with someone he or she trusts.
First 95	This means that 95% of people living with HIV know their HIV status
Second 95	This means that 95% of people who know their HIV-positive status are accessing antiretroviral treatment
Third 95	This means that 95% of people on treatment have suppressed viral loads
Adolescent	Is the phase of life between Childhood and adulthood from ages Fifteen to nineteen years
Young Women	Women aged twenty to twenty-four years old
Kizazi Kipya	This is a project that aims to enable one million Tanzanian orphans and vulnerable children (OVC) and young people affected by HIV and their caregivers to be provided HIV services and other related services to improve their well-being.
Middel learning institution	Those institutions provide an education at the level of certificate and diploma.
Urban	Defined as any place belonging to, or relating to, a town or city
Rural	Defined as any place far away from a known city or town
HIV self-testing Uptake	This means that if participants mentioned that had ever used the HIV self-testing kit since it had introduced in the country 2019

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background.

HIV self-testing (HIVST) is a process in which an individual is guided to take his or her sample either oral fluid or blood and test it for HIV and be able to interpret the result. Early intervention is targeted to attain 90-90-90 by 2020 (1). The End AIDS global strategy of 2021-2026 has explained HIVST as one of the interventions in reducing inequality in HIV testing and treatment services. This strategy aimed to attain 95-95-95 to end AIDS by 2030 targeting adolescent girls and young women (2). Through Global efforts, the status of people who didn't know their status decreased by 16% in 2020, from 46% in 2015 (3). Global HIV testing at the community level had a target of all people knowing their HIV status by 90%, unfortunately, was not maintained till 2020 with only 81%. Adolescent girls and young women (AGYW) (aged 15-24) have made a significant contribution to the high prevalence of HIV, which stood at 28% among this demographic compared to other groups by 2019, in Sub-Saharan Africa, this group accounted for 59% of newly HIV-infected individuals (4).

A different study has reported a low prevalence of HIVST uptake among African countries which imperatively increases its need to address its challenges so that it can be used by the community towards increasing HIV awareness and HIV status among individuals (12). HIVST has been trusted to unlock the first 90 as described by the study done in West and Central Africa regardless of the poor adoption of the services. 80.7% of the HIVST was acceptable among students < 24yrs (5). In Senegal, Mali, and Cote d'Ivoire, 500,000 people were provided with (HIVST), indicating a high rate of adoption of this method to determine their HIV status. (5). In contrast to the study conducted in South Africa, which involved 35 participants and showed that 80% of young adults preferred oral tests to blood tests, (6). HIVST program in Senegal, Mali, and Cote d'Ivoire involved a total of 500,000 individuals and demonstrated a high level of uptake (6).

“Kizazi Kipya” project was launched to address different challenges and difficulties which made an obstacle to the community to know their status due to unreached vulnerable population like orphans, those with disabilities and AGYW. (5). The risk of new infection increases among the AGYW as revealed that 25% of new infection by 2020 in Western and Eastern Africa. HIVST is the main way to prevent incidence of HIV infection among AGYW as the method to open access of other HIV cares (6).

HIV self-testing (HIVST) is more effective in encouraging individual uptake compared to other HIV testing modalities such as Provider Initiated Testing (PITC) and Voluntary Counselling and Testing (VCT). This comparison has demonstrated significant achievements, particularly among key populations and transgender individuals, who have a lower awareness of their HIV status (only 84% of PLWHIV are aware of their status), especially in sub-Saharan Africa. (9,10,11).

Achievement of the first 95%, a comprehensive study of the effectiveness, limitations, and opportunities of HIVST is crucial. A recent study conducted in Tanzania in 2021 among AGYW revealed that 50% of the population had never been tested for HIV, and more than 80% had not heard of HIVST, highlighting the need for further research and awareness-raising efforts (10)

1.2 Problem Statement

The burden of HIV infection is disproportionately higher among Adolescent Girls and Young Women (AGYW) compared to other demographics. The 2022/2023 Tanzania HIV impact survey showed that AGYW aged 15 to 24 are three times more likely to contract HIV than males, with a new infection occurring every three minutes (11).

Dodoma City has experienced population growth, particularly following the relocation of government offices from Dar es Salaam. Consequently, AGYW in the Dodoma city faces an elevated risk of contracting HIV.

Despite the significance of the issue, there exists limited knowledge regarding the barriers and facilitating factors for the uptake of HIV self-testing among AGYW in middle learning institutions. This research gap necessitates further investigation to better understand and address the factors influencing HIV self-testing among this target group

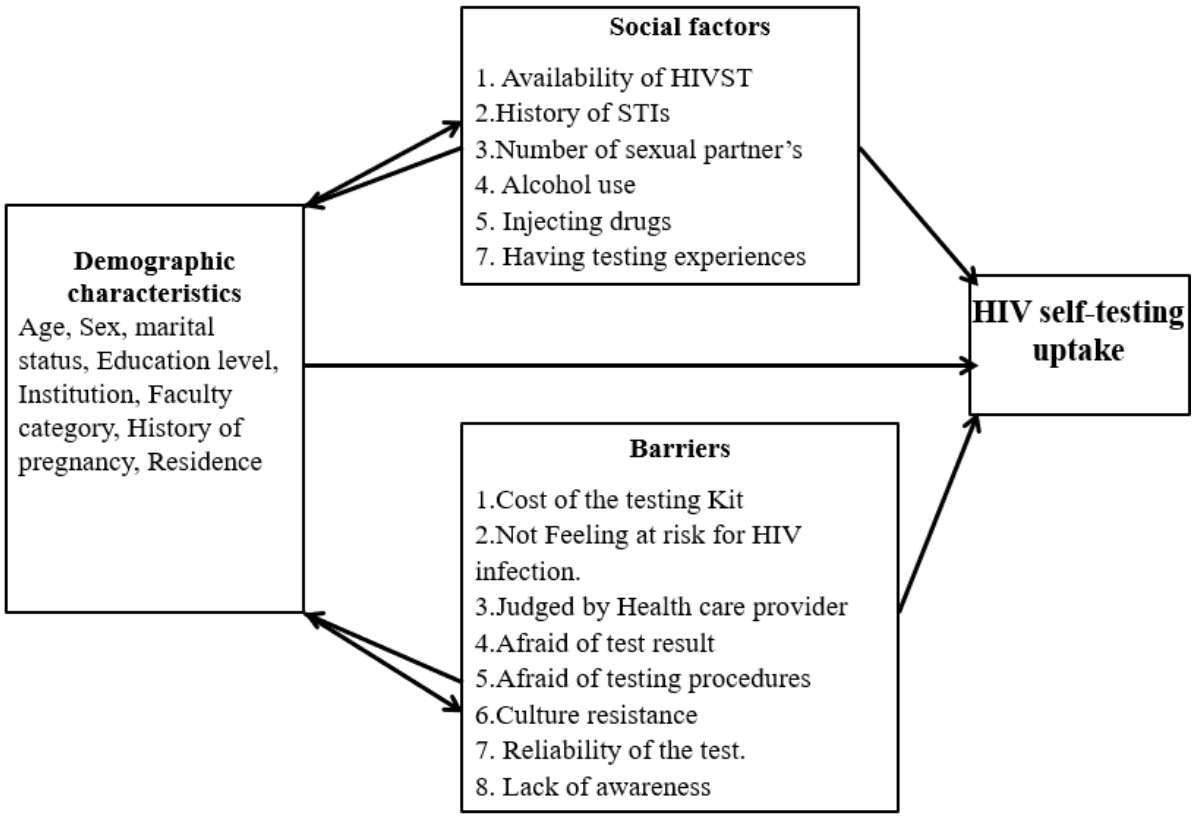
1.3 Rationale

This research provides valuable insights into the National AIDS, STIs, and Hepatitis Control Program (NASHCoP) in addressing specific areas that require strengthening for the uptake of HIV self-testing (HIVST) among Adolescent Girls and Young Women (AGYW). These findings will support the NASHCoP in further scaling up HIVST services throughout Tanzania.

By identifying the barriers hindering the adoption of HIVST among AGYW, the findings of this study enable the NASHCoP to develop targeted interventions that can effectively address these obstacles. This will contribute to increasing the utilization of HIVST among the specified group.

Furthermore, the outcomes of this research will be beneficial to hospitals and healthcare facilities by informing them about the necessary improvements in providing adolescent and youth-friendly services. This knowledge will help strengthen the healthcare system's ability to meet the unique needs of AGYW, including promoting HIVST as a crucial component of their healthcare options.

1.4 Conceptual Framework



Source: (Researcher's own created CF, 2023).

Figure 1: Conceptual framework on factors associated with HIVST uptake.

The relationship between the outcome and explanatory variables depicted in the figure below has been explored. The outcome variables, denoted as HIV self-testing uptake, and the independent variables include demographic characteristics of the participants such as age, address, religion, institution, faculty category, residence, and history of pregnancy. The factors previously mentioned to have either a positive or negative impact on HIV self-testing is identified as barriers and social factors.

The barriers associated with HIV self-testing include the cost of the testing kit, not feeling at risk of HIV infection, being judged by healthcare providers, fear of the test result, fear of testing procedures, cultural resistance, and reliability of the test. Social factors associated with HIV self-testing include the availability of HIV self-testing kits, history of sexually transmitted

infections, number of sexual partners, alcohol use, drug injection, and previous testing experiences.

There are interactions between factors, as indicated in the conceptual framework. Demographic characteristics interact with social factors, and factors such as not feeling at risk of HIV infection and fear of testing procedures may be influenced by religion, age, and faculty category. Social factors like the number of sexual partners may be influenced by the age of the participants and their residence, whether urban or rural, depending on the level of interaction. As observed in the conceptual framework, there is a direct interaction between the explanatory and outcome variables.

1.4 Research questions

1.4.1 Main research question

What are the prevalence and factors associated with the uptake of HIV self-testing among adolescent girls and young women in middle learning institutions in Dodoma city, Tanzania 2024?

1.4.2 Specific questions

1. What is the prevalence of HIV self-testing usage among AGYW in middle learning institutions in Dodoma city, Tanzania, in 2024?
2. What are the barriers to HIV self-testing among AGYW in middle learning institutions in Dodoma city, Tanzania, 2024?
3. What is the association between HIV self-testing uptake and socio-demographic factors among AGYW in middle learning institutions in Dodoma city, Tanzania, 2024?

1.5 Objectives

1.5.1 Broad objective

To determine the prevalence and factors associated with the uptake of HIV self-testing among adolescents' girls and young women in middle learning institutions in Dodoma city, Tanzania 2024

1.5.2 Specific Objectives

1. To determine the prevalence of HIV self-testing usage among AGYW in middle learning institutions in Dodoma city, Tanzania, 2024
2. To identify the barriers to HIV self-testing among AGYW in middle learning institutions in Dodoma city, Tanzania, 2024.
3. To determine the association between HIV self-testing uptake and socio-demographic factors among AGYW in middle learning institutions in Dodoma city, Tanzania, 2024

CHAPTER TWO

2.0 LITERATURE REVIEW

The prevalence and factors influencing HIV self-testing uptake among adolescent girls and young women are vital public health issues, given their heightened vulnerability to HIV infection. This demographic faces unique social, economic, and cultural challenges that affect their health-seeking behaviors and willingness to engage in testing. Understanding the prevalence of self-testing is crucial for identifying access gaps and developing targeted interventions that empower young women to manage their sexual health. Additionally, factors such as HIV knowledge, stigma, resource availability, and social determinants like education and socio-economic status significantly impact testing uptake. By examining these influences, the study aims to provide insights that can guide health policy and community programs, ultimately improving HIV prevention strategies and health outcomes for young women.

2.1 Prevalence of HIVST uptake

Several studies have been done in Africa to reveal the magnitude to which adolescent girls and young women how can access HIV testing services. Prior to launching HIV self-testing different studies showed that still, the mentioned group of the population had low access to HIV testing services as it has shown in the study done in Burundi a demographic Health survey 2016-2017 showed a magnitude of 27.1%, similarly in Tanzania same years 30% were reported by youth population having tasted for HIV(11,12,). Similarly, another study was done in Tanzania to observe the trends of improvement in Adolescent girls and young women can access the testing services, there was an improvement observed with poor coverage as expected as shown 7% in 2003-04, 31% in 207-08 and 40% 2011-12 (13).

The HIVST assessment was made in Malawi in 2022 women showed 40.1% utilization of the intervention among the population and a low percentage compared with men who had 45% the study had further analysis to other ages where the uptake decreases as the ages increase (23). In contrast to another study which was done in S. Africa only 2.6% were shown to be self-tasted for HIV (24). Another study which was done in South Africa targeting specifically AGYW has

shown an improvement in HIVST utilization of 73% (16).

Another study which was done in Rwanda showed the prevalence of AGYW in HIVST utilization was 55.4%, the same as another study done in Tanzania in 2021 showed a prevalence of 50% (12,17).

2.2 Association between HIV self-testing uptake and socio-demographic factors among AGYW

A study done in Ghana revealed the factors that facilitate the AGYW to utilize the HIV testing services as those who were married and previously married but other factors were protective as they were not increasing the chance of HIV testing services utilization like multiple sexual partners (18). Another study showed that those women aged 20-24 years are more likely to utilize the HIVST compared to others, those who attended a junior high school and those who have not been married (19).

In Uganda the study which was done shows a variety of factors that enhance the HIVST uptake, such as multiple sexual partners, alcohol consumption, drug abuse, having HIV testing experience, and a history of sexually transmitted infections with increasing age (17, 20,21). In Zimbabwe, the factors that were significantly associated with HIVST in AGYW are comprehensive high knowledge, knowledge about mother-to-child transmission, three or more lifetime sexual partners, and history of pregnancy (22).

The country has made an effort to change the legal accessibility of adolescents to HIV testing services to scale up which was made in 2019 and supported by another study(23,24). HIVST was much accepted and utilized in a study done in Kenya among pregnant women with the following factors explored, Unmarried women were more likely to use preferably the oral-quick as the needle was avoided and no pain was experienced (25).

2.3 Barriers associated with HIV self-testing among AGYW

Generally, the barriers which are associated with HIV testing accessibility among adolescents have been stipulated in different studies. Little has been done specifically on HIV self-testing among adolescent girls and young women.

The report which was written by the EECA countries, (Russia, Georgia, and Ukraine) on the barriers facing adolescents and youth in accessing HIV testing services, the report has given out the following factors, limitation of age, below 18 the adolescents were not allowed themselves to access HIV testing services. The testing was available by cost where adolescents had difficulty for them to access it, limited centers for adolescents to access the services, with no access to anonymous testing (26). Another study done in the Deep South explored several limitations which hinder adolescents and young women from accessing HIV testing services as mentioned, cost of the testing kit and no reimbursement from insurance, lack of knowledge on HIV specialty care availability, Not feeling at risk of HIV infection, HIV testing reflecting badly on me as a person, Being judged by health care provider, Afraid of testing result, afraid of others knowing that you have tasted and afraid of testing procedures (27,28).

Despite the limitations explored by the previous study then another study done in Sub-Sahara Africa made an addition to those factors which are the legal age of consent and lack of staff to provide the testing services (35). In contrast, another study done in Tanzania explored the same factors but categorized them into three groups, Provider capacity, Service modalities, and stigma and discrimination against adolescents and the youth population (29).

CHAPTER THREE

3.0 METHODOLOGY

3.1 Study design

A cross-sectional study was conducted

3.2 Study area

The study was conducted in Dodoma city. Dodoma city is the capital of Tanzania, and the new government has moved to Dodoma therefore the population dynamics have changed and could influence the risk behaviors of the inhabitants including middle learning institutions' students. The prevalence of HIV among the group have shown variation as compared with the Tanzania HIV survey of 2016/2017 was 2.2% and 2022/2023 the prevalence was 1.3%. Dodoma city has a size of 2769 square kilometers. It has 214,330 households, 4 divisions 41 wards 170 streets 42 villages, and 89 hamlets. The Municipality of Dodoma is located at the southeastern end of the Tanzania Central Plateau at an elevation of 1,200 meters above sea level. The town is located at the geographical center of the country on the vital Central Railway line; and on a major crossroad of the National East-West trunk road and the famous north-to-south Cape to Cairo Great North Road, which passes in Tanzania through Mbeya, Iringa, Dodoma, Babati and Arusha. The town is 465 kilometers from - Dar-es-salaam, and 425 kilometers from Arusha situated at 6oo south of the Equator. It has a total population of 765,179 (URT, 2022). There are 10 middle learning institutions in Dodoma City (Mtumba Teachers College, Local Government Training Institute (LGTI) Dodoma, Local Government Training Institute (LGTI) Hombolo, Dodoma Polytechnic of Energy and Earth Resources Management (Madini Institute), Dodoma Media College, Decca college of health and allied science, College of Business Education, City college of health and allied sciences, Capital teachers' college, Institute of rural development planning).

3.3 Study population, sample size, and selection

3.3.1 Study population

The study population includes female students aged 15-24yrs from the 5 college who were selected from 10 middle-level colleges found in Dodoma city. The colleges selected were Mtumba Teachers' College, City College of Health and Allied Sciences, Institute of Rural Development Planning, Local Government Training Institute (LGTI) Hombolo, and Decca College of Health and Allied Science.

3.3.2 Sample size

A single population proportion formula was used to calculate number of subjects to be included in this study. The prevalence of 50% (12).

$s = \frac{1.96^2 \text{x } 0.5(1-0.5)}{0.05^2} = 384$ DEFF of 2 =768

Whereby: Z = standard normal deviate,

corresponding to 95% Confidence Interval (Z = 1.96)

P = Proportion of HIVST prevalence (12) from previous studies (P = 50%)

n= minimum sample size required

e = Margin of error (e = 0.05)

The participants after adjusting for design effect of 2 was a minimum of 768. (12).

3.4 Sample Selection Procedures

Two-stage cluster sampling technique was used to select five middle learning institutions as mentioned above in Dodoma municipality (city). A probability proportional to size approach was used to calculate the sample size of each selected college, randomly three (3) years of study means year one, year two and year three were selected from each college. The female students were listed and assigned number by using random number generator randomly were selected.

3.5 Inclusion criteria

Adolescent girls and young women students aged 15-24 years. All female students of the specified group consented to participate in the study. Participants should be enrolled in a particular institution.

3.6 Exclusion criteria

Female students who didn't consent to participate in the study. Any student found seriously sick and not able to answer the questions.

3.7 Outcome variables

HIV self-test uptake is the outcome variable of this study categorized into Yes or No.

3.8 Independent Variables

These variables include, Age, faculties category, marital status, address, Residence, and Factors associated with HIVST uptake like integration of services, availability of HIVST, history of sexually transmitted infection, history of multiple sexual partners, Alcohol use, Injecting drugs, Having testing experience, Challenges faced of using HIVST like cost, Not knowing where to receive it, Not feeling at risk of HIV, Test will reflect badly on me, Judged by HCP, Afraid of the result, Fear of others knowing I have tasted for HIV, Afraid of testing procedures, inadequate awareness on HIVST, Culture resistance for testing, fear and denial, Gender norms, Reliability of the HIVST.

Residence either urban or rural.

3.9 Data collection procedures and tools

Three people were involved in the data collection process: the main researcher and two assistants. Those who assisted had a minimum degree level. They were trained in research ethics and research procedures. One day was used for training, and another day was used to conduct a pre-test study. Actual data was collected for 14 days. Class representatives helped to organize the classes and provide a convenient time. The available lecture hall was used to meet with the selected students, and consent and structured questionnaires were administered.

3.10 Investigation Tool, Validity, and Reliability

A structured questionnaire was used based on the study objectives. A tool was tested for its suitability for study purposes by conducting a pre-test study of 10% of the participants selected away from the college and involved in the study.

3.11 Data management and analysis

Data was analyzed by using Stata version 15.1. Continuous data was presented by mean and standard deviation followed by categorical data which is presented in frequency and proportion in tables. Barriers identified among AGYW were also presented by proportion in the bar chart. A modified Poisson regression model with the robust standard error was used to assess the association of factors independently with HIVST utilization, the factors were tested using a chi-square test to obtain those factors with a P-value < 0.20, then this criterion was used to involve the factors in multivariate analysis, by considering the goodness of fit of the model. Prevalence ratio and 95% confidence interval were obtained. A P-value of <0.05 was considered statistically significant.

3.12 Ethical consideration

Ethical approval was obtained from the Ethical Review Board at Muhimbili University of Health and Allied Sciences. Approval was obtained from the vice Chancellors or Principal of the mentioned college with clearly stated the purpose of the study, the risks, and its benefits. Informed consent was obtained from emancipated minors and adult participants for them to be enrolled in the study. The unique number was used in place of names to maintain confidentiality. The data obtained was stored in the computer with a password.

CHAPTER FOUR

4.0 RESULT

4.1 Social-demographic characteristics of the participants AGYW in middle learning institutions at Dodoma City, Tanzania 2024

A total of 771 adolescents and young women were recruited, with a mean age of 20.78 years (SD =1.85). Among them, 567 (73.54%) were aged between 20-24 years. The Central Zone, which includes Dodoma, Manyara, and Singida regions, had the highest representation with 291 participants (37.74%). Most participants were enrolled in non-health courses, accounting for 472 (61.22%) of the total, compared to those in health-related courses. Additionally, two-thirds of the participants resided in urban areas 493 (63.94%), and 701 (90.92%) reported no history of pregnancy (Table 1).

Table 1: Social-demographic characteristics of the participants AGYW in middle learning institution at Dodoma City, Tanzania 2024. (N=771)

Variable	Frequency (n=771)	Proportion (%)
Age		
15-19	204	26.46
20-24	567	73.54
Zones		
Lake	118	15.30
Northern	111	14.40
Central	291	37.74
Eastern	126	16.34
Southern	15	1.94
Southern Highlands	44	5.71
Southwest Highlands	29	3.25
Western	37	4.80
Chake-chake-Zanzibar	1	0.13
College		
City College of Health and Allied Science	147	19.07
Decca College of Health and Allied Science	152	19.71
Institute of Rural and Development Planning	163	21.14
Local government training institute	152	19.71
Mtumba teachers' college	157	20.36
Faculty		
Health-related course	299	38.78
Non-health related course	472	61.22
Residence		
Urban	493	63.94
Rural	278	36.06
History of pregnancy		
Yes	70	9.08
No	701	90.92

4.2 The prevalence of HIV self-testing usage among AGYW in middle learning institutions in Dodoma City, Tanzania, 2024

Among the participants, 360 (46.69%): (95%CI 43.18%-50.23%) have used the HIV self-test. (Table 2).

Table 2: Shows the prevalence of HIV self-testing usage among AGYW in middle learning college in Dodoma City, Tanzania, 2024 (N=771)

Variable	Frequency	Percentage: 95% CI
HIVST uptake		
Yes	360	46.69 (43.18-50.23)
No	411	53.31 (49.76-56.81)

4.3 Identified barriers to HIV self-testing among AGYW in middle learning institutions in Dodoma City, Tanzania, 2024

The identified barriers from the participants who didn't take the HIV self-testing 411 (53.31%) include, cultural resistance, reported by 392 participants (95.38%); being judged by healthcare providers, mentioned by 372 respondents (90.51%); legal issues preventing healthcare providers from providing the kit, noted by 360 participants (87.59%); fear of testing procedures, cited by 291 participants (70.80%); concerns about the reliability of the test, expressed by 286 participants (69.59%); fear of test results, reported by 283 participants (68.86%); accessibility of the HIVST kit, an issue for 280 participants (68.13%); fear of others knowing they had tested, mentioned by 273 participants (66.42%); awareness of HIV self-testing, low among 193 participants (46.96%); and not feeling at risk of HIV infection, noted by 73 participants (17.76%) (Figure 1).

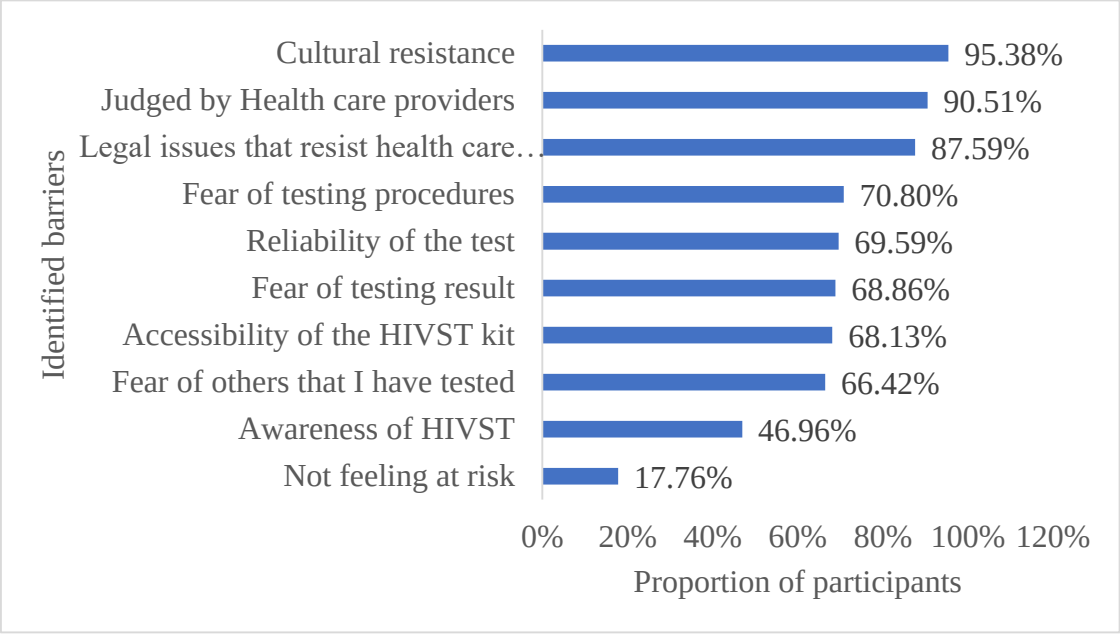


Figure 2: Shows identified Barriers to HIV self-testing among AGYW in middle learning institutions in Dodoma City, Tanzania, 2024

4.4 Prevalence distribution of factors on HIV self-test uptake among AGYW in middle learning institutions at Dodoma City, Tanzania 2024

Socio-demographic factors have independently shown associations with HIV self-test uptake among adolescents and young women, with a few exceptions. The following factors demonstrated significant associations with the outcome, as observed: Faculty category of participants studying health-related courses (169, 56.52%) with a p-value of <0.001; followed by those with a history of pregnancy (45, 64.29%) with a p-value of 0.002; availability of the HIVST kit (271, 100.00%); history of sexually transmitted infections (13, 100.00%); multiple sexual partners (55, 100.00%); alcohol use (18, 100.00%); and those with other reasons (55, 100.00%), all with p-values <0.001, respectively. Injecting drugs (4, 100.00%) showed a p-value of 0.032. All factors with p-values less than 20% were included in multivariate analysis, utilizing a modified Poisson regression model with robust standard error to control for confounders (Table 3).

Table 3: Prevalence distribution of factors on HIV self-test uptake among AGYW in middle learning institutions at Dodoma City, Tanzania 2024 (N=771)

Variable	Total n=771	HIV self-test uptake n (%	P-Value
Residence			
Urban	493	241 (48.88)	
Rural	278	119 (42.81	0.104
Faculty category			
Health-related Course	299	169 (56.52)	
Non-Health related course	472	191 (40.47)	<0.001
Age group			
15-19	204	90 (44.12)	
20-24	567	270 (47.62)	0.390
History of pregnancy			
Yes	70	45 (64.29)	
No	701	315 (44.94)	0.002
Availability of HIVST kit			
Yes	271	271 (100.00)	
No	500	89 (17.80)	<0.001
History of STI's			
Yes	13	13 (100.00)	
No	758	347 (45.78)	<0.001
Multiple sexual partner			
Yes	55	55 (100.00)	
No	716	305 (42.60)	<0.001
Alcohol use			

Yes	18	18 (100.00)	
No	753	342 (45.42)	<0.001
Injecting Drugs			
Yes	4	4 (100.00)	
No	767	356 (46.41)	0.032
Having testing experience			
Yes	273	273 (100.00)	
No	498	87 (17.47)	
Feeling at risk of HIV infection			
Yes	55	55 (100.00)	
No	716	305 (42.60)	<0.001

4.5 The factors associated with HIV self-testing uptake among AGYW in middle learning institutions in Dodoma City, Tanzania, 2024.

Studying health-related courses and having multiple sexual partners were associated with increased prevalence ratios (aPR 1.14, 95% CI: 1.04-1.27) and (aPR 1.23, 95% CI: 1.05-1.45), respectively, compared to participants who studied non-health related courses and those without multiple sexual partners. HIV self-test kit availability and having testing experience increased the prevalence ratio by more than 2-fold for participants using the HIVST kit (aPR 2.83, 95% CI: 2.21-3.62) and (aPR 2.65, 95% CI: 2.05-3.43), respectively. Those who feel at risk of HIV infection had (aPR 1.29, 95% CI: 1.11-1.50), (Table 4).

Table 4: The factors associated with HIV self-testing uptake among AGYW in middle learning institutions in Dodoma City, Tanzania, 2024 (N=771)

Characteristics	Total N=771	HIVST - Yes n=360(%)	Crude prevalence Ratio (cPR) CI 95%	Adjusted Prevalence Ratio (aPR) CI 95%	P-Value
Residence					
Urban	493	241 (48.88)	1.14(0.97-1.34)	1.08(0.97-1.21)	0.14
Rural	278	119 (42.81)			
History of pregnancy					
Yes	70	45 (64.29)	1.43(1.17-1.73)	1.11(0.93-1.32)	0.320
No	701	315 (44.94)	1		
Faculty					
Health-related course	299	169 (56.52)	1.40(1.20-1.61)	1.14(1.04-1.27)	0.008
Non-Health related course	472	191 (40.47)	1		
HIVST kit availability					
Yes	271	271 (100.00)	5.62(4.65-6.78)	2.83(2.21-3.62)	0.001
No	500	89 (17.80)	1		
History of STI					
Yes	13	13 (100.00)	2.18(2.02-2.36)	1.18(0.80-1.76)	0.39

No	758	347 (45.78)	1		
Multiple sexual partner					
Yes	55	55 (100.00)	2.34(2.15-2.55)	1.23(1.05-1.45)	0.010
No	716	305 (42.60)	1		
Alcohol use					
Yes	18	18 (100.00)	2.20(2.03-2.38)	1.02(0.73-1.41)	0.91
No	716	342 (45.42)	1		
Injecting drugs					
Yes	4	4 (100.00)	2.15(1.99-2.32)	0.96(0.53-1.75)	0.90
No	767	356 (46.41)	1		
Having testing experience					
Yes	273	273 (100.00)	5.72(4.72-6.92)	2.65(2.05-3.43)	0.001
No	498	87 (17.47)	1		
Feeling at risk of HIV infection					
Yes	55	55 (100.00)	2.35(2.16-2.56)	1.29(1.11-1.50)	0.001
No	716	305 (42.60)	1		

CHAPTER FIVE

5.0 DISCUSSION

The study revealed that the prevalence of HIV self-test uptake among adolescent girls and young women is 46.69%. Barriers revealed by this study included cultural resistance, judged by healthcare providers, legal issues that resist healthcare providers from providing kits to adolescents, fear of testing procedures, reliability of the test, fear of testing result, accessibility of the HIVST kit, fear of others that I have tested, awareness of HIVST and the least barriers was not feeling at risk.

The factors that influenced AGYW to take the HIV self-test uptake were Multiple sexual partners, studying health-related courses, HIV self-testing kit availability, having testing experience, Increased risk of Infection, and feeling at risk of HIV infection.

5.1 Prevalence of HIV self-test kit among AGYW

The prevalence of 46.69% of HIV self-testing uptake among the participants shows that there is a low uptake of this intervention. The low uptake might be influenced by the availability and the experiences within the country, as this is a new intervention. The HIV self-testing kits are not as widely available as other HIV testing services. The other possible reason may be the awareness creation among the sub-group is not sufficient as they may be afraid of using the intervention. The intervention itself provides a conducive environment of the clients to maintain privacy and confidentiality. Adolescents and young women are somehow affected by the environment of services provision to our facilities. Increasing awareness among them of HIV self-testing will increase uptake among them. This indicates that this population despite other means of accessing HIV testing services there is a need to increase HIV self-test awareness to scale up sub-population HIV awareness status. In contrast to the study which was done in rural Malawi and Rwanda (14,17).

In contrast, a study in South Africa showed a high uptake of HIV Self-tests among youth. There was a friends, peers and partners' invitation to use the test kit and they were able to report the results after testing. Other reasons included distribution to their campus, addressing barriers

like confidentiality, privacy, control over disclosing one's status to others, distribution to the community, free of charge, and availability to the nearby pharmacies (15,27–30).

5.2 Factors Influencing HIV Self-test Uptake among AGYW

Factors influencing the HIV self-testing uptake among Adolescent girls and young women include multiple sexual partners, which act as a risky sexual behavior prompting populations to seek HIV self-tests to ascertain their HIV status. Adolescent girls and young women are sexually active and more likely to have multiple sexual relationships. As they become aware of the test that will maintain their privacy likely they will opt for HIV self-testing to know their HIV status. Participants studying health-related courses were associated with HIV self-test uptake, likely due to directly acquired knowledge in their colleges compared to counterparts not taking the health-related courses. The health-related courses like Nurses, Clinical officers, and pharmacists were among the participants in this study. Their curriculum supports the study of HIV-AIDS condition and they finally acquire knowledge on the varieties of testing interventions available in the countries. Those who do not undertake the health-related courses like teachers, Human resources officers, and community development officers were unable to acquire this knowledge because it is out of their syllabus. The availability of HIV self-testing kits also influenced uptake, despite the HIV self-test kits being centralized in the facility and distributed by other stakeholders to the key vulnerable population still shown to have statistically significant toward the intervention uptake compared to other countries they have different modalities of HIV Self-test kits distribution which made the wide availability of the kits around the population

Other factors included participants' testing experiences, and feeling at risk of HIV infection these two factors prompted the participants to test themselves. The participants may be exposed to different exposures during their lifetime time like having a relationship with the HIV-positive partner, having a needle pricking history, sharing sharp objects with known HIV-positive individuals, and being involved in car accidents all these circumstances may lead to HIV oneself testing to know her HIV status. This contrasts with other studies that have shown these factors are associated with HIV self-testing uptake among AGYW (15–17,27,28).

5.3 Barriers associated with HIV self-test uptake among AGYW

The prevalence revealed by this study highlights efforts to overcome barriers in scaling up services among AGYW. Cultural resistance was notably observed, with many participants reporting that this could be attributed to cultural norms where males dominate over females. The lack of freedom for women to make decisions about their health emerged as the most commonly reported barrier (30). Judgments by healthcare providers also hindered access to HIV self-testing uptake, likely due to perceptions that adolescents are promiscuous and fears of sexual abuse by providers. This contrasts with studies conducted in Tanzania in 2019 and Malawi in 2020 (31,32).

Legal issues preventing healthcare providers from offering HIV self-testing kits to AGYW was also highlighted. This suggests that despite changes made by the government of Tanzania in November 2019, there may still be insufficient awareness among healthcare providers that adolescents can receive and use these kits independently (21,23,33–37).

Other barriers include fear of testing procedures, concerns about the reliability of the test, and fear of the test results. These may stem from the fact that this intervention is relatively new to the country and not widely accessible in various settings, unlike in countries such as South Africa where HIV kits are available on campuses, in pharmacies, and free of charge. Increasing accessibility could raise awareness and familiarity with the test, thereby enhancing its reliability and reducing fears related to the procedure and results (38,39).

Additional barriers identified included awareness about HIV self-testing and a lack of perceived risk of HIV infection, despite engaging in highly risky sexual behavior among this age group. This underscores the need for improved awareness about HIV self-testing and testing services to increase service uptake. These findings contrast with other studies that support the barriers identified in this research (23,24,36,40).

Limitations encountered in this study, like in other cross-sectional studies, included responder bias and social desirability bias. Hence the outcome of interest was self-reported which may under or over-estimate the magnitude of the HIV self-testing Uptake. These limitations were

mitigated by providing a sufficient explanation of the study, and its purpose, and ensuring participants could answer questions in privacy. Another limitation was the failure to establish the temporal relationship between outcomes and factors, suggesting the need for further study to establish the incidence and temporal relationship between factors associated with HIV self-testing uptake among adolescent girls and young women.

CHAPTER SIX

6.0 CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

The uptake of HIV self-testing among adolescent girls and young women (AGYW) in Dodoma City is notably low, falling below 55% compared to the overall HIV testing rates in the region. Several factors contribute to the likelihood of AGYW using HIV self-tests, including having multiple sexual partners, studying health-related courses, availability of test kits, previous testing experience, and perceived risk of HIV infection. However, barriers such as cultural resistance, judgment from healthcare providers, legal restrictions, fears about testing procedures and results, and limited accessibility significantly hinder uptake. To improve HIV self-testing rates, it is crucial to address these barriers and enhance awareness and accessibility of self-testing kits. Given the high risk of HIV infection among AGYW, increasing their access to and use of self-testing is vital for better health outcomes

6.2 Recommendations

The Ministry of Health, through NASHCoP, needs to scale up HIV self-testing among AGYW to reach the recommended target of at least 95%.

The Ministry of Health, via NASHCoP, must increase awareness of HIVST among sub-groups through health promotion to enhance the reliability of the test and eliminate fears related to the HIVST procedure and test results.

The Ministry of Health, supported by NASHCoP, should enhance accessibility of the HIVST kit among AGYW by implementing various distribution methods such as pharmacies and campuses, and by providing the kits free of charge.

The Ministry of Health, with support from the President's Office - Regional Administration and Local Government (PORALG), needs to improve youth-friendly services in hospitals and facilities, ensuring good customer care among healthcare providers, and providing adequate counseling to adolescents on HIV testing services.

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APPENDICES

Appendix 1. Data Collection Tool (English and Swahili version)

English version Questionnaire

1. Questionnairess

S/N	QUESTIONS	RESPONSE
	DEMOGRAPHIC INFORMATION	
1.	Participant ID	
2.	Age of the Participant	
3.	Address	
4.	Religion	1. Catholic
		2. Lutheran
		3. Muslim
		4. Protestant
		5. Pagan
5.	Institution name	
6.	Mention your faculty category	
7.	Any history of pregnancy	1. Yes
		2. No
8.	Residence of the participant	1. Urban
		2. Rural
9.	Have you ever had HIV self-testing?	1. Yes
		2. No
	Social information that facilitates HIV self-test uptake	
	Note: What makes you have an HIV self-test?	
10.	The availability of the HIV self-testing kit	1. Yes
		2. No
11.	Any history of sexually transmitted infections?	1. Yes

		2. No
12.	Number of sexual partners	1. Yes
		2. No
13.	Alcohol use	1. Yes
		2. No
14.	Injecting drugs	1. Yes
		2. No
15.	Having testing experience	1. Yes
		2. No
16.	Others	1. Yes
		2. No
17.	If yes specify……..	
	Factors that hinder HIV self-testing uptake	
	Note: What makes you not have an HIV self-test?	
17.	Cost of the Self-testing kit	1. Yes
		2. No
18.	Not Feeling at risk for HIV infection	1. Yes
		2. No
19.	Judged by Health care provider	1. Yes
		2. No
20.	Afraid of the test result	1. Yes
		2. No
21.	Afraid of the testing procedures	1. Yes
		2. No
22.	Any cultural issue causes resistance	1. Yes
		2. No

23.	Reliability of the test	1. Yes
		2. No
24.	Lack of knowledge	1. Yes
		2. No
25.	Fear and denial	1. Yes
		2. No
26.	The legal issue that resists health care providers to provide Self-test kit	1. Yes
		2. No
27.	Gender norms	1. Yes
		2. No
28.	Fear of others knowing that I have tested for HIV	1. Yes
		2. No
29.	Other	1. Yes
		2. No
30.	If yes specify…….	

DODOSO LA KISWAHILI

NA	SWALI	JIBU
1	Namba ya ushiriki	
2	Umri wa mshiriki	
3	Anuani ya mshiriki	
4.	Dini ya mshiriki	1.Romani Katoliki
		2.Lutherani
		3.Muislamu
		4.Protestanti
		5.Mpagani
5	Jina la Chuo cha kati	
6.	Taja kozi unayosoma	
7	Una historia ya ujauzito	1. Ndio 2. Hapana
8	Makazi yako	1.Mjini 2.Kijini
9	Ulishawahi kupima kipimo binafsi cha VVU	1.Ndiyo 2.Hapana
TAARIFA ZA KIJAMII ZINAZO CHANGIA KUJIPIMA KIPIMO BINFSI CHA VIRUSI VYA UKIMWI (VVU)		
NUKUU. Nini kimechangia kujipima kipimo binafsi cha VVU		
10	Kuna upatikanaji rahisi wa vipimo binafsi vya VVU	1.Ndiyo 2.Hapana
11	Una historia ya kuwa na magonjwa ya zinaa au ngono	1.Ndiyo 2.Hapana
12	Una mpenzi zaidi ya mmoja?	1.Ndiyo 2.Hapana
13	Je unatumia pombe	1.Ndiyo 2.Hapana
14	Unatuma madawa ya kulevya	1.Ndiyo 2.Hapana
15	Umewahi kufanya kipimo binafsi cha VVU	1.Ndiyo 2.Hapana

16	Je kuna sababu nyingine?	1.Ndiyo
		2.Hapana
17	Kama ipo itaje/zitaje…….	
SABABU ZINAZO ZUIA KUPIMA KIPIMO BINAFSI CHA VIRUSI VYA UKIMWI (VVU)		
NUKUU; Nini kimesababisha usipime kipimo binfsi cha VVU?		
17	Kuna gharama za upatikanaji wa kipimo binafsi cha VVU	1.Ndiyo 2.Hapana
18	Sipo kwenye hatari ya kupatapa maambukizi ya VVU	1.Ndiyo 2.Hapana
19	Kuhisiwa vibaya na watoa huduma za afya	1.Ndiyo 2.Hapana
20	Unaogopa kuona majibu ya kipimo binafsi cha VVU	1.Ndiyo 2.Hapana
21	Unaogopa namna na njia za kujipima kipimo binafsi cha VVU	1.Ndiyo 2.Hapana
22	Kuna sababu cha kitamaduni zinazochangia nisijipime kipimo binafsi cha VVU	1.Ndiyo 2.Hapana
23	Siamini uhakika wa majibu ya kipimo binafsi cha VVU	1.Ndiyo 2.Hapana
24	Sina elimu ya kutosha kuhusu kipimo binafsi cha VVU	1.Ndiyo 2.Hapana
25	Naogopa namna kipimo binafsi cha VVU kinavyopimwa	1.Ndiyo 2.Hapana
26	Kuna sababu za kisheria zinazozuia watoa huduma za afya kutoa vipimo binafsi vya VVU	1.Ndiyo 2.Hapana
27	Kuna sababu za kijinsia zinazochangia kupima kipimo binafsi cha VVU	1.Ndiyo 2.Hapana
28	Unaogopa watu wako wa karibu wakigundua kuwa umepima VVU	1.Ndiyo 2.Hapana
29	Je kuna sababu nyingine?	1.Ndiyo
		2.Hapana
30	Kama ipo itaje/zitaje……	

Appendix II. Ethical clearance/permission letter

UNITED REPUBLIC OF TANZANIA

MINISTRY OF EDUCATION, SCIENCE AND TECHNOLOGY

MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES

OFFICE OF THE DIRECTOR – RESEARCH, PUBLICATIONS AND INNOVATION

Ref. No.DA.282/298/01.C/2055 Date: 26/02/2024

MUHAS-REC-02-2024-2055
David J. Osima
MUHAS

RE: APPROVAL FOR ETHICAL CLEARANCE FOR A STUDY TITLED: THE PREVALENCE AND FACTORS ASSOCIATED WITH HIV SELF-TESTING UPTAKE AMONG ADOLESCENT GIRLS AND YOUNG WOMEN IN MIDDLE LEARNING INSTITUTIONS IN DODOMA CITY TANZANIA

Reference is made to the above heading,

I am pleased to inform you that the Chairman has on behalf of the University Senate, approved ethical clearance of the above-mentioned study, on recommendations of the Senate Research and Publications Committee meeting accordance with MUHAS research policy and Tanzania regulations governing human and animal subjects research.

APPROVAL DATE: 26/02/2024
EXPIRATION DATE OF APPROVAL: 26/02/2025

STUDY DESCRIPTION:
Purpose:

The purpose of this cross-sectional study is to determine the prevalence, and factors associated with the uptake of HIV self-testing among adolescent girls and young women in middle-level learning institutions in Dodoma City, Tanzania.

The approved protocol and procedures for this study is attached and stamped with this letter, and can be found in the link provided: https://irb.muhas.ac.tz/storage/Certificates/Certificate%20-%2014554.pdf and in the MUHAS archives.

The PI is required to:

1. Submit bi-annual progress reports and final report upon completion of the study.
2. Report to the IRB any unanticipated problem involving risks to subjects or others including adverse events where applicable.
3. Apply for renewal of approval of ethical clearance one (1) month prior its expiration if the study is not completed at the end of this ethical approval. You may not continue with any research activity beyond the expiration date without the approval of the IRB. Failure to receive approval for continuation before the expiration date will result in automatic termination of the approval for this study on the expiration date.
4. Obtain IRB amendment (s) approval for any changes to any aspect of this study before they can be implemented.
5. Data security is ultimately the responsibility of the investigator.
6. Apply for and obtain Data Transfer Agreement (DTA) from NIMR if data will be transferred to a foreign country.
7. Apply for and obtain Material Transfer Agreement (MTA) from NIMR, if research materials (samples) will be shipped to a foreign country.
8. Apply for and obtain permission to publish the results from National Institute for Medical Research. The application should be before submitting to a publisher and not concurrently through the email publications@nimr.or.tz.
9. Any researcher, who contravenes or fail to comply with these conditions, shall be guilty of an offence and shall be liable on conviction to a fine as per NIMR Act No. 23 of 1979, PART III section 10 (2)
10. The PI is required to ensure that the findings of the study are disseminated to relevant stake holders.
11. PI is required to be versed with necessary laws and regulatory policies that govern research in Tanzania. Some guidance is available on our website https://drp.muhas.ac.tz/.

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CHAIRPERSON, MUHAS RESEARCH AND ETHICS COMMITTEE