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The Role of Sexual Reproductive Health Awareness in Reducing HIV Infections Among the Youth in Kibaha District, Tanzania

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Abstract

This article assesses the role of sexual reproductive health awareness in reducing HIV infections among the youth in Kibaha District, Tanzania. The objective is to investigate the role of sexual reproductive health awareness in reducing HIV infections among the youth. The study results revealed that more mature youth were more aware of the pandemic, while gender-wise females were more aware than males. Moreover, married couples were more aware because of their direct involvement in reproduction; and those involved in business were more aware of the pandemic due to high mobility. In terms of land ownership, youth with land were more informed than those who were landless, and youth who earned higher income were more aware than those with less income. There were no significant differentials in awareness between religions. The results on other socio-economic variables indicated that people who had more access to mass media, like radios, were more aware of the pandemic, as were those with modern houses. Moreover, youth who used electricity as a source of energy were more aware than those who used other sources of energy like firewood. The desire for money and other materials was the major driving force for youth getting HIV infections. Also, heterosexual sex was the major means of HIV transmission, and the major forums where youth got information on the pandemic were youth groups in the community from health centres. The study recommends that efforts of controlling the pandemic be stepped up, and more posters be put in transit routes to warn the community of the pandemic.

Keywords: *reproductive, HIV, health, youth, Tanzania*

1. Introduction

Sexual reproductive health education (SRHE) programs began in the 1950s as a part of family planning to control fertility as a major determinant of population growth. Nonetheless, the emergency of HIV infections in the 1980s raised the importance of SRHE, which was later popularized by the World International Conference on Population and Development (ICPD) held in Cairo, which made sexual reproductive health education as one of the intervention measures of HIV infections (UNFPA, 1994; Hall et al., 2012). From that time, SRHE has been intensified because the HIV/AIDS pandemic is a sexually transmitted disease that kills people largely in the reproductive age (Barnett & Whiteside, 2002; Appiah-Agyekum & Suapim, 2013). Hence, to propagate this goal intensively,

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the United Nations established the UNAIDS in 1999 to control the spread of HIV infections at global level (Haule, 2017). Moreover, it appears that at the regional level, most youth in developing countries are aware of HIV infections through various intervention measures and programs that aim to control the spread of the pandemic (Burgoyne & Drummond, 2008; Brockman et al., 2005; NACP, 1984; Haule, 2017).

Sexual reproductive health education on HIV infections in Tanzania began immediately after the outbreak of the pandemic in Kyaka area in Kagera region in 1983 by the establishment of the National AIDS Control Program (NACP) in 1984, which was replaced by the National AIDS Control Commission (TACAIDS) in 1999. The efforts of these government organizations and non-governmental organizations (NGOs) managed to raise the awareness and/or knowledge on reproductive health and HIV infections to about 83% in 2016 (URT, 1999; DHMIS, 2011–12, 2015–2016). As a result of these efforts the overall prevalence of HIV/AIDS was reduced from 12% in 1985 to about 4.7% in 2018. These efforts spread to other levels of administration in the country like the Coast region whereby, in Kibaha district alone, several government organizations like TACAIDS and NGOs like the Chama cha Uzazi na Malezi Bora Tanzania (UMATI), Tanzania Youth Alliance (TAYOA), and the National Council for People Living with HIV AIDS (NACOPHA), were established to raise the knowledge and awareness of HIV infections among the youth. This age-group was targeted since it is the one that is at high risk of the pandemic due to several factors like the presence of cross-generational sex, multi-partner sexual activities, high incidence of sexually transmitted infections, and living in areas with trunk-roads that cut across the country on a daily basis (TDHS 2015/2016).

As indicated in the conceptual framework **(**Figure 1), the independent variables that influence the awareness of HIV infections among youth are socio-economic variables like population structure and income (Box 1).

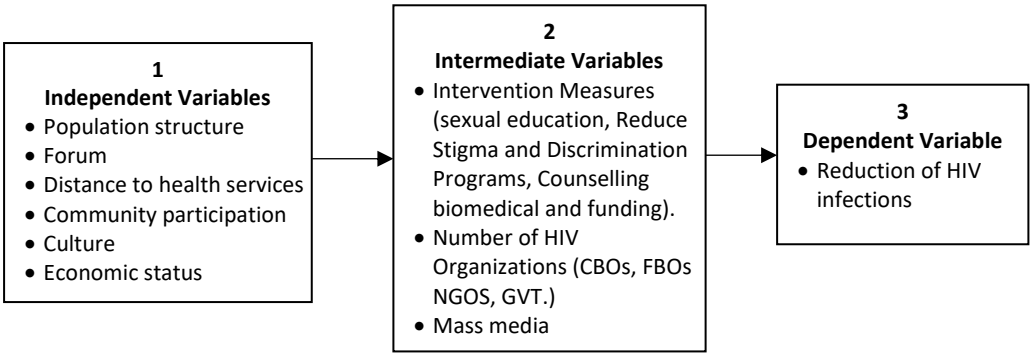

Figure 1: ***Factors that Influence the Awareness of HIV/AIDS of Youth***

Source Modified from High Risk and Risk Management Theory by Hosegood and Ford in 2003

A number of intervention measures (intermediate variables) have been introduced, such as counselling, biomedical and funds flow to improve the livelihoods of the youth. These are largely funded by establishments such as community based organizations (CBOs), faith based organizations (FBOs), and NGOS; and also by the government (Box 2). Finally, the dependent variable is the reduction of HIV infections (Box 3).

2. Literature Review

2.1 Theories on the Spread of Diseases

A number of theories/models have been developed to explain the various ways of disease transmission. As a whole, some of these theories/models clearly show the medium under which a disease spreads from one person to another, or from one place to another; the long-term impact of a disease/ pandemic, and preventive/intervention measures needed to control a disease.

2.1.1 Geographical Spread Mathematical Theory

Brockman et al. (2005) developed a mathematical model to analyse the spread of epidemics because worldwide it is well established that the spread of diseases has disastrous consequences for human health and economics in areas with high mobility and traffic intensity. Usually, the major cause of geographical spread of a disease is the movement of infected people from one place to another. Generally, this theoretical concept of the model develops an understanding on the geographical spread of modern pandemics like HIV/ AIDS, which in turn gives room to understanding how districts like Kibaha become more vulnerable to sexual diseases due to high mobility of population owing to the presence of trunk-roads ferrying people/goods in and out of Dar es Salaam City, in-migration of population from up-country, coupled with counter-urbanization from the City. This view is supported by the theory that the outbreak of HIV/AIDS pandemic in Kyaka in Kagera Region was due to trade trafficking to the DR Congo (Conover, 1993; Chonjo, 2009).

2.1.2 High Risk and Risk Management Theory

The high risk and risk management theory was developed by Hosegood and Ford in 2003 as tool for monitoring international sexual behaviours to control HIV infections. This theory assisted in analysing individual's behaviours, sexual partner's relations, and perceptions on the use of condoms in relation to HIV transmission risks. Hence the spread of HIV in districts like Kibaha is fuelled by high-risk sexual networks like those among the youth and casual partners along the trunk roads from Dar es Salaam City (Chonjo, 2009, Chuwa, 2010). This theory is useful to this study because it identifies the most vulnerable groups in HIV infection, which includes the youth in Kibaha.

2.1.3 Susceptible, Infectious and Recovery Theory (SIR)

This theory was introduced by Keeling in 2004, and it classified a population in terms of disease infections in three classes: *susceptible, infectious,* and *recovery*. According to the theory, immediately after being born, a person becomes susceptible of contracting various forms of disease, and so falls in the *susceptible* class. Later on, the person may catch a diseases and move into the *infectious* class. Infected individuals may spread the disease to other people, and some may recover from the disease and become a *recovery* class. According to the theory, individuals who have recovered become immune for life. As a whole, this theory applies to this study because here we have the *susceptible* group, which is the youth. However, the theory has been criticized because there is no complete recovery in the case of HIV: only that the effects of the viruses are reduced by ARVS.

Figure 2: ***Susceptible, Infectious and Recovery Theory***

Source: Modified from Keeling 2004

3. Empirical Literature

3.1 Variables Influencing Reproductive Health Awareness Among Youth

While anyone can be infected with HIV, there are certain social or age-groups that are more vulnerable than others. These includes homosexuals, sex commercial workers, reproductive age-groups, injection drug abusers, and people with extreme poverty (NIH, 2012). Nonetheless, young people—especially the youth—are also at more risk of HIV infections. There is a strong relationship between age and HIV infections because most sexual relations and reproduction follow the age-groups of a population. Generally, most studies on HIV indicate that the highest rate of HIV infections occurs in age-group 20–24, followed by age-group 25–29, which strongly correlate with the peak of fertility in most developing countries. Also, high risk behaviours among these age-groups—e.g., prostitution, drug abuses, easy influence by strong peer group relationships, and poverty—make this age-group more vulnerable to the disease (Dehne, 2001; NIH, 2012; UNAIDS, 2018; Freeman, 2012).

Another independent variable that influences sexual reproductive health awareness is gender. Although HIV infections occurs to both sexes, in Sub-Saharan Africa women account for more than half of the people living with HIV due to biological and social reasons. This has a significant impact on the gender composition of the population in two age-groups 15–49 and 0–4

because the major mode of transmission is sexual intercourse, and mother-to-child transmission (DMHS 2015–16). Moreover, when HIV infections are examined by age-groups the results indicate that the prevalence rate is high among females in age-group 20–29 because this is the high reproductive period in Sub-Saharan Africa. This level of prevalence reverses in age-groups 30–39 where it is more prevalent among males because females are more infected at younger ages compared to males (UNAIDS, 2018; TACAIDS, 2018; Anglewisz et al., 2010).

The third independent variable that influences sexual reproductive health awareness is education. As indicated by TACAIDS (2018), there is a need to raise public awareness on HIV infections to the population with different levels of education to reduce HIV prevalence. Also, as indicated by the NIH (2012) and Freeman (2012), awareness on sexual reproductive health is high among the educated population compared to the uneducated who have a tendency of associating death, including one arising from HIV/AIDS, as being caused by witchcraft (CDC, 2017; Kabote & Niboye, 2012).

The fourth independent variable that influences sexual reproductive health education is occupation. As observed by the PRB (2005) and Freeman (2012), sexual reproductive health awareness depends on the employment status of a person. Generally, HIV infections mostly affects the working age population (15–64 years) leading to the labour force being affected by the pandemic. Moreover, sexual reproductive health education among workers depends on their exposure to information obtained from the mass media and other sources like counselling (Nicolle, 1991; CDC, 2018; TACAIDS, 2018).

The fifth independent variable that influences sexual reproductive health education is the socio-economic structure of a population. The level of awareness of HIV/AIDS differs from different socio-economic groups such as transport workers. It also includes factors that encourage population mobility such as migration and commuting. It also includes the type of economic activity such as petty business (CDC, 2018; Burgoyne & Drummond, 2008; Chonjo 2009, Chuwa 2010).

The sixth independent variable that influences reproductive health education is the sexuality of youth. As life expectancy of people living with HIV improves in sub-Saharan Africa, a considerable proportion of women and men living with HIV desire to have children in the future. Hence, integrating sexual and reproductive health care with HIV/AIDS services encourages spouses to make informed choices about their reproductive lives and the right of self-determination to reproduce (Kabote & Niboye, 2012).

The seventh independent variable related to risky sexual behaviour is poverty. Poverty highly influences risky sexual behaviours like prostitution, homosexuality, and cross-generational sex, which most studies have found to have high prevalence of HIV in a community. Another variable related to

poverty is housing conditions whereby there are big differences in awareness and impacts of the pandemic in poor and rich households (Beegle & Krutikova, 2008; Mbonile & Lihawa, 1997; Kabote & Niboye, 2012; Kessy 2014).

3.2 Intervention Measures

As observed by Kissy (2014) and Olson (2006), for any HIV/AIDS intervention measure to be effective it must include behavioural, biomedical and structural measures. Behavioural intervention measures include sex education, which must be imparted to the community and institutions like schools and health centres to raise the awareness about HIV infections and how to control it. Such an education must also address the issue the stigma and discrimination of people suffering from the pandemic. Another behavioural intervention measure is counselling, which needs to be provided at all levels of health services and working places.

Biomedical interventions utilize a mixture of clinical and medical approaches to reduce HIV transmission like the encouragement of male circumcision and the distribution of female and male condoms. Others include the supply of antiretroviral drugs for the prevention of mother-to-child transmission (PMTCT), pre-exposure prophylaxis, post-exposure prophylaxis, treatment as a prevention, HIV testing and counselling, treatment of sexually transmitted infections, needle and syringe programs, opioid substitution therapy, blood screening and the distribution of antiretroviral drugs to prolong the life of those effected.

Structural interventions include female empowerment on when they should have sex; equal opportunities in education so that women do not became dependents of spouses enacting laws that protect the rights of people living with HIV; laws that reinforce gender equality, or laws on the discrimination of prostitution or sex commercial work. Structural interventions also involve the construction of health facilities where people with HIV can get ARVS (Richard, 1999; Reniers, 2008).

All the above studies in the empirical literature review have indicated how diseases spread, and the various measures taken to raise the awareness of youth about HIV infections. Nonetheless, most of these studies have not evaluated the impact of these programmes on the reduction of HIV infections among the youth. This study aims to address this gap by looking at the role of reproductive awareness in reducing HIV infections in Kibaha District, Tanzania.

4. Research Methodology

This study employed a case study research design because it is based on assessing sexual reproductive health awareness among youth in the study area. The study was conducted in two villages—Ungindoni and Mwambisi—in Kibaha District, Coast region, Tanzania (Figure 3).

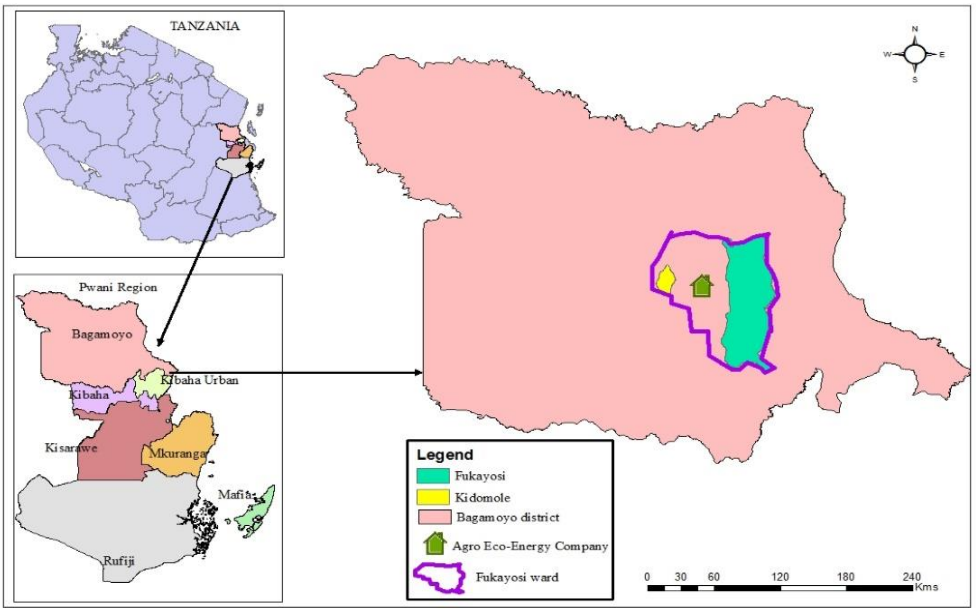

Figure 3: ***Location of the Study Area***
Source: Field Survey 2017/2019

The study selected Kibaha District because most trunk routes upcountry and to neighbouring countries like Malawi, Zambia and D.R. Congo pass through the district. Besides, the district has a strong interaction with Dar es Salaam City, which is the most populated city in Tanzania. Also, it is among the districts that receive a large inflow of in-migrants from other places in the country. Moreover, the two wards and two villages were randomly selected because they have experienced an intensive reproductive health training among the youth (URT, 2012).

The sample size for the study was obtained using the probability formula for single population proportion as indicated by Kothari (2002):

$$N = Z2pq/e2$$

Whereby n = the number of sample size, Z as standard value which corresponds to a 95% level of significance, which is equal to 1.96.

The total population of youth in the two villages was 1,734. Therefore:

$$\frac{1.734(1.96)^2}{(0.062)^2} + 0.5 + 0.5 = 173$$

Key informants were purposively selected according to their position in the community (Table 1). As a whole, primary data were gathered by using quantitative method as a major source of data collection, which was supplemented by qualitative methods like the use of focus group discussions (FGDs). Primary data was collected using a closed questionnaire. The FGDs were conducted by using a group of about 5 to 10 persons guided by leading questions.

Table 1: Sample Size of Youth Respondents by Village

Village	Population size	10% Youth Respondents
Ungindoni	560	56
Mwambisi	1,174	117
Total	**1,734**	**173**

Source: Fieldwork Survey 2017/2019.

4.1 Statistical Tests and Regression

Chi-square test at 5% level of significance was calculated to test the relationship between the dependent variable and independent variables. The results from the Chi-square test led to the calculation of a logistic regression analysis. Nonetheless, only those independent variables that showed significant relationship at 5% level with the dependent variable were considered in the regression analysis.

$$x_o^2 = \sum \frac{(O_i - E_i)^2}{E_i}$$

Where:

Oi = average values of each of the sample sets var1, E_i = variance of each of the sample sets, and n and $n2$ = number of records in each sample set.

5. Results and Discussion

5.1 Variables Influencing Awareness of Sexual Reproductive Health

The results of the study, as indicated in Table 2, showed that mature youth aged 20–24 years (45%) were more aware of HIV infections compared with younger ones aged 15–19 (36%) and 10–14 (16%). On the issue of which age-group was more affected by HIV infections, the results showed that middle age-groups (25–64) years were more affected (80.3%) when compared to the youth (15.0%) and the elderly (4.6%) because this age-group is more involved in childbearing. At the village level, the awareness on sexual reproductive health was about 82.2% in Ungindoni village, and 79.6% in Mwambisi village. These results were statistically significant, with $\chi^2 = 242.004$, df = 2, p-value = 0.000. These results are similar to the study by the WHO (2019), which examined the right age for starting sexual reproductive health education.

Table 2: Awareness of Sexual Reproductive Health by Characteristics of Youth

Age-group	Ungindoni		Mwambisi		TOTAL	
	(= 56)	Percentage	(n = 117	Percentage	(n = 173)	Percentage
10–14	9	16.1	20	17.1	29	16.8
15–19	21	37.5	43	36.8	64	37.0
20–24	26	46.4	54	46.2	80	46.2
χ^2 = 130.438, degree of freedom = 2, p-value = 0.000						
Gender						
Males	26	46. 3	50	34.7	**76**	**43.9**
Females	30	53.7	67	57.3	**97**	**56.1**
χ^2 = 67.928, df = 2 , p-value = 0.000						
Marital Status						
Single	15	26.7	31	26.5	46	26.6
Married	31	55.4	56	47.9	87	50.3
Others	10	17.9	30	25.6	40	23.1
χ^2 = 97.32, df = 2, p-value = 0.008						
Education						
None	14	25.0	12	10.3	26	15.0
Primary	20	35.7	23	19.7	43	24.9
Secondary	22	39.3	82	70.0	104	60.1
χ^2 = 222.004, df = 2, p-value = 0.000						
Age-group most affected						
Youth 10–24 years	8	14.4	18	15.3	26	15.0
Middle age 25–64 years	46	82.2	93	79.6	139	80.3
Elderly 65+ years	2	3.4	6	5.1	8	4.6
Student	4	7.1	17	14.5	21	12.1
Business/self-employed	18	32.1	50	42.7	68	39.3
Farmers/peasants	10	17.9	20	17.1	30	17.3
Employed	24	42.9	30	25.7	54	31.3
χ^2 = 87.331, df = 2, p-value = 0.000						
Land Ownership						
Yes	39	70.0	88	75.0	127	73.4
No	17	30.0	29	25.0	46	26.6
Monthly Income (TZS)						
0–99	4	7.1	5	4.3	9	5.2
100–199	4	7.1	8	6.8	12	6.9
200–299	11	19.6	9	7.8	20	11.5
300–399	11	19.6	23	19.7	34	19.7
400–499	11	19.6	23	19.7	34	19.7
500+	15	27.0	49	41.7	64	37.0
χ^2 = 114.48, df = 2 and p-value = 0.000						

Highly affected Sectors						
Agriculture	17	30.4	29	24.8	46	26.6
Manufacturing	6	10.7	12	10.3	18	10.4
Social services	27	48.2	70	59.8	97	56.1
Cultural services	6	10.7	6	5.1	12	6.9
χ^2 = 138.46, df = 2 and p-value = 0.00						

Source: Field Survey 2017/2019

In terms of gender, the study results indicated that in both villages (Ungindoni (53.3%) and Mwambisi (57.3%)), females were more aware and knowledgeable of HIV infections because of their attendance of clinics, which raises their awareness on reproductive health (Table 2). These results are similar to those of studies by Jagero and Kushoka (2011) and Dehne and Riedner (2001), which found that females were more informed than males. The findings of this study were statistically significant, with χ^2 = 67.928, df = 2 and p-value = 0.000. One respondent had a similar view in pointing out:

> *In modern societies like this one, males act like robots to the extent that they seek for women in the Internet, and practice sex with them without knowing each other thoroughly. In the end women get HIV despite their being very committed to marriage by remaining very faithful. We are more aware of HIV/AIDS because the end is usually death or using ARVS for life (*In-depth interview of a Widow at Mwambisi Village, 1 July, 2017)

The results of the study in terms of marital status indicated that married people were more informed (50.3%) than singles (26.6%), followed by other marital groups such as widows, separated, and divorced (23.1%) (Table 2). At the village level, married people in Ungindoni (55.4%) were more informed than those in Mwambisi (47.9%) because of the relatively close proximity of the former village to trunk routes. The findings of the study were not statistically significant, with χ^2 = 97.32, df = 2, p-value = 0.008.

In terms of education, the results showed that youth with secondary education were more aware on HIV issues (60.1%) compared with those with only primary education (24.9%), and not educated (15%). When the analysis was extended to village level, there was a big difference between the two villages ranging from 70% in Mwambisi to about 30% in Ungindoni. These findings are similar to those of Todaro (1992), Ancheta et al. (2005) and DHIMS (2015–2016), which showed that education is important because it has a great influence on thinking and interaction with others. Also, these studies found that there were differences in the awareness of HIV prevalence with levels of education. The findings of the study were statistically significant, with χ^2 = 222.004, df = 2, p-value = 0.000. Again, this finding was corroborated by a teacher at Kibaha High School:

Nowadays education is a major base for imparting knowledge and awareness on the spread of HIV/AIDS in rural areas like these of Kibaha district because there are several educated people settling in the district as a counter-urbanization from Dar es Salaam, especially after retirement. These people join HIV/AIDS community counselling programs, especially under the umbrella of religious groups (Teacher at Kibaha Secondary School, 1 July, 2017).

Concerning the type of occupation, the findings indicated that people in business or self-employment were more aware of HIV infections (39.3%), followed by those who were employed (31.3%). At the village level, in Ungindoni the highest level of awareness was among employed (42.9%), followed by those who were in business or self-employed. In Mwambisi, the highest proportion was found among those in business or self-employed (42.7%), followed by those who were employed (25.7%). These results are similar to those of Chonjo (2009) who found that these groups were more informed because they have high access to information and have the means of buying sources of information like radios and televisions. The study results were statistically significant, with $\chi^2 = 87.331$, df = 2 and p-value = 0.000.

Moreover, the results on income and property ownership indicated that the level of awareness among land owners was about 73.1%, while for those who were landless it was 26.6%. In the two villages, youth who owned land either by purchasing or inheritance were more aware of the risks of HIV infections compared to those who were landless by 70% of the youth in both villages (Table 2). These results are similar to those of Giovanelli et al. (2013) and Mbonile and Kengeta (2017) who observed that property ownership provide economic power. Land is one of the most critical economic assets for the poor in most developing countries, serving as the main source of production, food security, and social security for many families, which in turn reduce the risks of HIV infections.

Furthermore, in terms of income, the results revealed that youth who earned about TZS500,000 and above were more informed about HIV (37.0%). Also, the level of awareness on sexual reproductive health increased with the level of income earned (Table 2). These results are similar to what was observed by Chuwa (2010): that rich households have more access to mass media such as newspapers and other publications, as well as television and radios that provided information on HIV/AIDS. Also, almost the same results were obtained by the Centre for Disease Control (CDC) (2017) in their study of HIV/AIDS prevalence by level of income among urban population in the USA. The findings were statistically significant, with $\chi^2 = 114.48$, degree of freedom = 2, and p-value = 0.000. Also, these results were confirmed by one focus group member in Ungindoni village thus:

*Many rich people in this village died because of their indiscriminate sexual behaviour of snatching other people's wives and girls passing here from Dar es Salaam to Dodoma, especially during parliamentary sessions. There are a lot of undercover guest houses here (*gesti bubu*). The chance for surviving from HIV infections is very narrow, especially among the youth* (Member of a FGD, 30 June, 2017).

As concerns in which economic sector were the youth more aware of reproductive health and HIV infections, the study findings revealed that people

in social services were the most highly informed of HIV infection (56%), compared with other sectors such as agriculture (27%), manufacturing (10%), and cultural services (7%). At the village level, the youth in Mwambisi were almost equally informed (94.6%) when compared to those in Ungindoni (60%). The findings were statistically significant, with $\chi^2 = 138.46$, df = 2, and p-value = 0.000.

5.2 Awareness of Sexual Reproductive Health by Socio-cultural Variables

In terms of religion as an independent variable, the results showed that Christians (54.9%) were slightly more aware than Muslims (45.9%), which may be a result of Christians being largely monogamous. Nonetheless, when these results are analysed by village, Muslims in Ungindoni (56%) were more aware of sexual reproductive health and HIV infections, while in Mwambisi it was Christians (60%) who were more aware than their Muslim counterparts. These results are similar to those of TCAIDS (2018), which recommended that new outlooks on HIV/AIDS should be explored more than just generalizing that, by being polygamist, Muslims may have less information on HIV infections and transmissions (Figure 4). These findings were not statistically significant, with $\chi^2 = 167.03$, degree of freedom = 2, and p-value = 0.035.

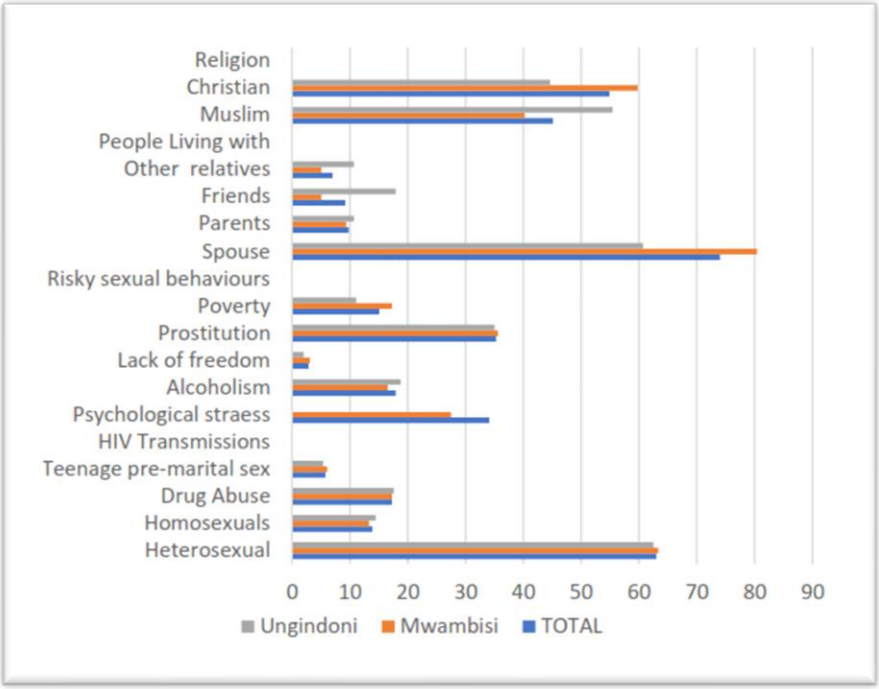

Figure 4: ***Sexual Reproductive Health Awareness by Socio-cultural Characteristics of Youth***

Source: Filed Survey 2017/2019

In terms of the people one is living with, the results showed that spouses (74%) were more aware of sexual reproductive health and HIV infections when compared to parents (9.8%), friends (9.2%) and other relatives (7.0%). When the analysis is done by villages, the youth in Mwambisi village were more aware (80.4%) when compared with Ungindoni village (60.4%) due to their proximity to major health centres (Figure 4). These results are similar to those of Nnko et al. (2004) who found that, in rural Tanzania, females maintained the secrets of HIV infections more when compared to swaggering males. Also, they are similar to what was observed by Bongaarts (1996) and Reniers (2008): that in countries with a high prevalence of HIV infections, married couples have a shared risk of acquiring HIV/AIDS. They further found out that husbands were a bit more accurate in assessing their own risk of HIV infection than that of their wives, while wives were more accurate in assessing the HIV status of their spouses. The study findings were statistically significant, with $\chi^2 = 108.019$, df = 3, and p-value = 0.000.

Furthermore, the results revealed that the major risky behaviour in HIV infections was prostitution (35.3%), followed closely by psychological stress (34.1%). Other factors that influenced risky sex behaviours were alcoholism (17.9%), lack of freedom to discuss sex (2.9%), and poverty (15.3%). Almost the same results were observed at the village level, whereby prostitution was high in both villages (35%), followed by physiological stress; which was about 26.6% in Ungindoni and 22.4% in Mwambisi (Figure 4). These results are similar to what was observed by the CDC (2018): that in the USA and other African countries, HIV is spread by having unprotected sex and risky behaviours such as excessive drinking and the use of drugs. The findings were statistically significant, with $\chi^2 = 113.665$, df = 2, and p-value = 000.

In terms of the means of transmission, the findings revealed that the major means of transmission were heterosexual sex (69%), followed by drug abuse (17.3%), homosexuality (13.9%), and teenage pre-marital sex (5.8%). At the village level the findings revealed heterosexual sex was almost similar in Ungindoni (62.5%) as in Mwambisi (63.3%) (Figure 4). These results are similar to a study that was conducted by Gualala and Madisen (2007) and Shien et al. (2019 on sexual risk evaluation among adolescents, which found that most of them were not using condoms when they play sex. The findings were statistically significant, with $\chi^2 = 372.770$, df = 3, and p-value = 0.000.

5.3 *Awareness of Sexual Reproductive Health by Property Ownership and Household Characteristics*

The results in Table 3 show that youth who had radios—which are more affordable in rural areas compared to televisions—were more aware of sexual reproductive health (71%) compared to those with televisions (15.8%) and mobile phones (13.2%). At the village level, radios emerged strongly with 74% in Mwambisi, while in Ungindoni it was 63%. The findings were statistically significant, with $\chi^2 = 148.075$, degree of freedom = 2, and p-value = 0.000.

Table 3: Sexual Reproductive Health Awareness by type of Housing

Mass Media Properties	Ungindoni		Mwambisi		TOTAL	
	(n = 56)	%	(n = 117)	%	(n = 173)	%
Radio	36	64.3	87	74.4	123	71.0
Television	9	16.1	18	15.4	27	15.8
Mobile phone	11	19.6	12	10.2	23	13.2
χ^2 = 148.075, df = 2, p-value = 0.000						
Type of wall materials						
Bricks	40	71.4	93	79.4	133	76.8
Poles	8	14.3	12	10.3	20	11.6
Mud	8	14.3	12	10.3	20	11.6
χ^2 = 236.443, df = 4, p-value = 0.000						
Type of roofing materials						
Corrugated iron sheets	48	85.7	105	89.7	153	88.4
Grass	8	14.3	12	10.3	20	11.6
χ^2 = 92.947, df = 2, p-value = 0.000						
Source of energy						
Charcoal	3	5.4	6	5.1	9	5.2
Firewood	17	30.4	12	10.3	29	16.8
Electricity	33	58.8	93	79.5	126	72.8
Gas	3	5.4	6	5.1	9	5.2
χ^2 = 256.443, df = 4 and p-value = 0.000						

Source: Field Survey 2017/2019

In terms of wall materials used in the construction of houses, those with modern houses built of bricks were more aware (77%) compared to those with poor houses made of poles (12%) and mud (12%). These findings were statistically significant, with $\chi2$ = 236.443, df = 4, and p-value = 0.000. The same results were found in terms of roofing materials, whereby those whose houses were roofed by iron sheets were more aware of sexual reproductive health (88%) when compared to those whose houses were roofed by grass. The results were statistically significant, with $\chi2$ = 92.947, df = 2, and p-value = 0.000.

Moreover, in terms of sources of energy used both for cooking and lighting, the results show that those using electricity (74%)—which opens more accessibility to mass media—were more aware compared to those with other sources of energy like charcoal (5%), firewood (5%), and gas 17%). This variable was statistically significant, with $\chi2$ = 256.443, df = 4, and p-value = 0.000. These results are similar to what was observed by the USAID (2020): that mass media interventions increase awareness/knowledge, improve risk perception, change sexual behaviours, and question potentially harmful social norms. Such interventions may utilize radios, televisions, and other outlets like phones, or improvise multi-level efforts in which mutually reinforcing messages are offered through interpersonal, community, and national channels. In this regard, mass media interventions are a critical part of an effective prevention approach.

5.4 Awareness of Risky Factors by Place of Getting Information

The results of this study revealed that the major factors that influenced HIV infections in Kibaha district were having transit trunk roads to up-country and neighbouring countries (57%), proximity to Dar es Salaam (22%), and in-migration (21%) (Table 4). These findings were not statistically significant, with $\chi^2 = 11.40$, degree of freedom = 2, and p-value = 0.565. Generally, these results were similar to those of a study conducted by Mbongua et al. (1995) in Kenya, whereby it was observed that the risk of HIV infections was high among truck drivers. Also, the study results are similar to Atilola et al. (2010), whose study in southern-west Nigeria found that truck drivers were at high risk of getting HIV infections because of prostitution along trunk roads with strange partners. They are also similar to those of a study by Botros et al. (2009) in Azberjan, which found that trunk route drivers were at high risk of getting HIV/AIDS infections.

Table 4: Sexual Reproductive Health Awareness by Factors Influencing HIV Infections

Risky Factors	Ungindoni		Mwambisi		TOTAL	
	(n = 56)	%	(n = 173)	%	(n = 173)	%
Proximity to Dar es Salaam	15	26.4	23	19.4	38	22.0
In-migration of people	11	19.2	26	21.9	37	21.4
Transit route of trucks	30	54.4	68	58.7	98	56.6
$\chi^2 = 11.40$, df = 2, p-value = 0.565						
Source of information						
Parents	1	2.2	3	2.1	4	2.3
Peer groups	2	3.1	8	7.1	10	5.8
Relatives	14	24.5	31	26.5	45	26.0
Mass media	33	59.4	62	52.9	95	54.9
Concerts	6	10.8	13	11.4	19	11.0
$\chi^2 = 294.82$, df = 2, p-value = 0.000						
Risky Sex Behaviour						
Cross generational sex	5	8.2	11	9.2	16	9.2
Play sex among youth	7	12.3	12	10.4	19	11.0
Desire for money/materials	36	65.0	78	67.0	114	65.9
Sex commercial work	8	14.5	16	13.4	24	13.9
$\chi^2 = 129.03$, df = 2, p-value = 0.002						

Source: Field Survey 2017/2019

Moreover, the findings of the study revealed that a majority of the youth obtained information on HIV through the mass media (55%), followed by other sources such as relatives (26%), concerts (11%), peer groups (11%), and parents (2%). These findings were statistically significant, with $\chi^2 = 294.82$, df = 2, and p-value = 0.000. Also, they are similar to what was observed by Haule (2017) in a study on youth vulnerability to HIV infections in Masasi district; and by Chonjo (2009) in her study of HIV/AIDS among the elderly in Makete district.

Regarding the type of behaviours leading to HIV infections, the results revealed that the leading factor was the desire for money and other material things (66%). This was followed by others like sex commercial work (14%), play sex among the youth (11%), and cross-generational sex (9%). These results were statistically significant, with $\chi^2 = 129.03$, degree of freedom = 2, and p-value = 0.000. These findings were similar to those of Chuwa (2010) in her study on the impact of HIV/AIDS on fertility in Kyela District, and the PRB (2005) in their study of HIV infections among coastal communities in Tanzania.

5.5 Forum and Distance Youth Receive Awareness on HIV Infections

In this variable, the study revealed that the major forums from which the youth get information about sexual reproductive health were youth groups (66%), working places (25%), and from kitchen parities and schools where it is incorporated in the syllabus of subjects like Biology and Civics (Figure 5). These findings were statistically significant, with $\chi^2 = 116.15$, degree of freedom = 2, and p-value = 0.00. Also, these results are similar to those of the PRB (2005).

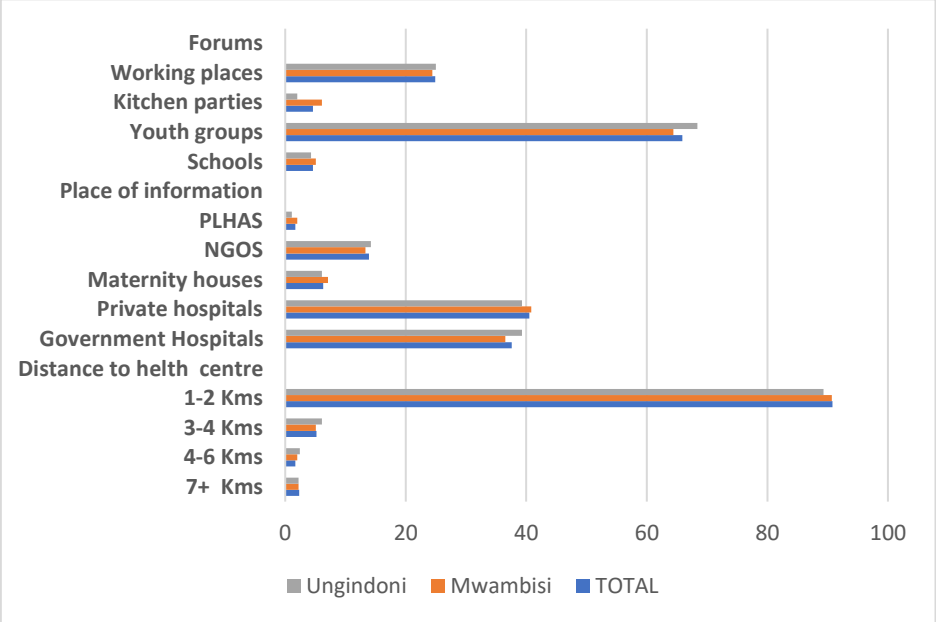

Figure 5: ***Sexual Reproductive Health Awareness by Source of Information***
Source: Field Survey 2017/2019

Meanwhile, in terms of places where this information is obtained, a majority of the respondents got it from private hospitals (41%) and government hospitals (38%). Nonetheless, regarding proximity to health centres, a majority were close to the health services, i.e., 1–2km (90.8%). These findings were statistically

significant, with $\chi^2 = 155.05$, degree of freedom = 2, and p-value = 0.000. Generally, these results are similar to those of Jogero and Kushoka (2011). Moreover, in terms of the distance travelled to the nearest health centre, the results showed that youth residing within 1–2km from a health centre were more informed (90.8%) than those residing 3km or more from a health centre (5%). These results were similar at the village level, whereby in Mwambisi it was 90.7%, and in Ungindoni it was 89.3%. These findings were not statistically significant, with $\chi^2 = 158.03$, degree of freedom = 2, and p-value = 0.065. These results were similar to what Chuwa (2010) found in her study of HIV/AIDS in Kyela District, and Ancheta et al. (2005) in their study of reproductive health education.

5.6 *Role of Awareness of Sexual Reproduction Health in Reducing HIV Infections*

Concerning participation in the provision of reproductive health services among the youth, the results indicated that a majority (86.7%) did not participate in the formation of various sexual reproductive health organizations, which means most of the organizations dealing with the HIV/AIDS pandemic in the study area were top-down. At the village level, the results revealed that 90.1% of the youth in Ungindoni, and 87.7% in Mwambisi villages did not participate in the initial establishment of civil and non-governmental organizations dealing with reproductive health of the youth in their villages. In spite of this, however, both villages graded the services of the organisations as 'good' and 'very good' in terms of the provision of reproductive health services, while only a small proportion graded them 'poor' or 'excellent' (Table 5). These results are similar to what was observed by Kabote and Niboye (2012).

Table 5: Participation and Provision of Reproductive Health Services Among Youth

Participation	Ungindoni		Mwambisi		TOTAL	
	(n = 56)	%	(n = 117	%	(n = 173)	%
Yes	4	9.9	19	16.3	23	13.3
No	52	90.1	98	87.7	150	86.7
Ranking						
Poor	9	15.5	22	18.4	31	17.9
Good	34	62.2	69	59.2	103	59.5
Very good	12	21.1	25	21.4	37	21.4
Excellent	1	1.2	1	1.0	2	1.2

Source: Field Survey 2017/2019

These results—as indicated in Photo 1, Table 6, and Figure 6—indicate that a majority of the people (95%) perceived that HIV prevalence has been decreasing with time in Kibaha district, as well as in the study villages, although the level of HIV prevalence was a bit higher in Ungindoni (94.6%) compared to that of Mwambisi (94.0%).

Photo 1: *Logo Showing to Stop HIV Infections*

Table 6: Peoples' Perceptions on HIV Prevalence in the Study Area

Levels of Prevalence	Peoples' Perceptions on HIV Prevalence				TOTAL	%
	Ungindoni	%	Mwambisi	%		
Decreasing	53	94.6	110	94.0	164	94.8
Increasing	2	3.6	5	4.3	7	4.0
Don't Know	1	1.8	2	1.7	2	1.2
Types of Interventions						
Behavioural	22	40.0	56	47.9	**78**	**45.1**
Biomedical	20	35.7	49	41.9	**69**	**39.9**
Structural	14	24.3	12	10.2	26	15.0
Total	**56**	**100.0**	**117**	**100.0**	**173**	**100.0**

Source: Field Survey 2017–2019

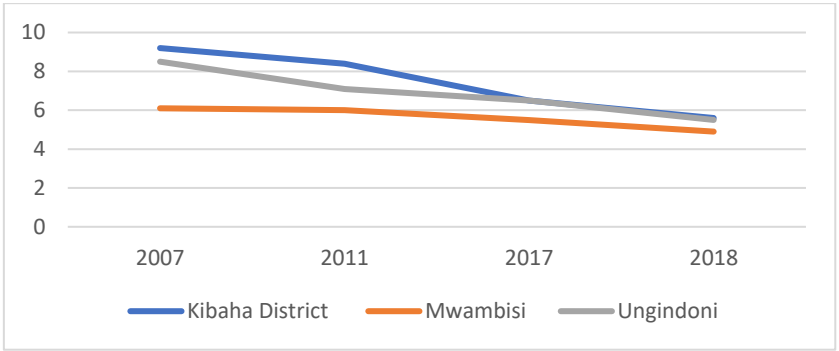

Figure 6: *Decline of HIV Infections from 2007–2018*

Source: District and Village TACADS Reports 2007, 2011, 2017 and 2018

In terms of the types of intervention measures, the results indicate that the proportion of behavioural interventions was higher in both villages compared to biomedical and structural interventions. These results are similar to those of other studies like those of Rao et al. (2008), which examine the structural approach in preventing HIV infections in India; and those of Shen et al. (2019) that examined the medical approach on condom use among married female migrants to measure their psychological stress in China. These results are also confirmed by a narrative by one elderly person in Mwambisi village:

> *In the 1990s several people were dying of HIV/AIDS because there were few weeks that passed without having a funeral of one who died of AIDS. Every household experienced a funeral due to this pandemic. Nowadays several months and even a year can pass without an HIV/AIDS death due to the interventions of giving sick people ARVs drugs* (Elder who participates in In-depth Study in Mwambisi Village 23rd July 2019).

Also, the results are similar to the UNAIDS (2018) and AVAC (2018) studies, which found that if there is no prevention, there will be no end to HIV infections in the world. Moreover, these results resemble most surveys conducted in Tanzania on HIV/AIDS (1999 up to 2015–16): DHIS 2003–04; HMIS 2011–12; HMIS 2015–16) (URT 1999). They are also similar to what was observed by Avert (2017) and AVAC (2018): that HIV prevention programs like those introduced along the trunk roads of Kibaha district with the aim of halting or reducing the transmission of HIV normally focused more on preventing the transmission by using a combination of complementary activities that include changing the behaviour, biomedical and structural interventions. A combination of these have been successful in reducing HIV infections at global level, as well as at Kibaha District. Moreover, as reported by the THIS (2017), the extensive use of antiretroviral treatments and medications has intensively helped to minimize the impact of HIV in the district over the last decade. The intervention programs have increased the availability of condoms in Tanzania.

Moreover, as observed by UNAID (2017), at initial stages, HIV prevention programs like those introduced in Kibaha district focused primarily on preventing the sexual transmission of HIV through behaviour change along trunk routes and minor townships like Mlandege and Kwa Mathiasi by using the ABC approach, i.e., **A**bstinence, **B**e Faithful, and Use **C**ondom to reduce HIV infections (Photo 1). Nonetheless since the mid-2000s it became obvious that effective HIV preventions required to take into account and address the underlying factors behind HIV infections and transmission.

5.7 Regression Analysis

A binary logistic regression analysis was estimated to establish the relationship between the independent and dependent variables related to HIV awareness and the reduction of HIV infections in Kibaha district (Table 7). The results indicate that there was a significant levels of awareness of HIV infections with most independent and intermediate variables, with p-value of 0.000 or more.

Table 7: Regression on Awareness and HIV Reduction.

Independent Variables	Estimated B-values	Standard Error	p-value
General characteristics of population	35.767	6.966	0.000*
Socio-cultural factors	35.501	12.167	0.000**
Risky sexual behaviours	25.160	12.146	0.000***
Sources of information	15.600	37.289	0.000***
Proximity to Dar es salaam	24.516	12.146	0.000*
Distance to a health centre	22.358	7.777	0.000*
Forums	35.731	10.677	0.000***
Household characteristics	39.294	12.567	0.000*
Type of intervention measures	33. 140	7.0880.	0.0000***

6. Conclusion

This study was conducted in Kibaha District where a sample of 173 youth aged 10–24 years was randomly sampled. The results on objective one showed that more mature youth (20–24 years) were more aware of the pandemic than their counterparts; while females were more aware than males because they attended medical clinics where they get information on HIV. Moreover, married couples were more aware than singles because they are directly involved in sexual reproduction. In addition, those involved in business/self-employment were more aware of the pandemic due to their high mobility and contacts in the community. Also, in terms of land ownership, youth with land were more informed than those who were landless. Almost the same results were observed in terms of the level of income whereby youth who earned high income were more aware than those with less income. In terms of religion, there was a slight difference between Muslims and Christians. The results on other socio-economic variables indicated that people living as spouses were more aware of the pandemic, while in terms of property ownership those who owned radios were more aware of the pandemic, as was the cases with those who had modern houses.

Moreover, youth who used electricity as source of energy were more aware than those who used other sources of energy. Also, regarding awareness of factors influencing risky sex behaviours, prostitution was identified as the leading factor. Besides, the desire for money and other material belongings were the major driving forces for youth getting involved in risky sexual behaviours. Furthermore, the study found that youth who travelled short distances to health service centres were more informed about the pandemic compared to their counterparts who travelled longer distances. Also, heterosexual sex was identified to be the major means of transmission of the pandemic in the study area.

The second objective of the study was to examine the sources of information on the awareness of sexual reproductive health among the youth in the study area. The results showed that the major forums where youth got information were

youth groups in the community, health centres, and government hospitals. Also, the study identified that the major source of information of sexual reproductive health among the youth was the mass media, which include radios, televisions, as well as newspapers. The study's third objective was to evaluate the role of awareness in sexual reproductive health in the reduction of HIV infections. The results showed that a majority of the respondents (94%) perceived that there was a decrease in the prevalence and infections of HIV in their villages.

In view of these findings, therefore, the study recommends that since a majority of the people in Kibaha district still face the threat of HIV infections, there is a need for civil societies, NGOs and the government to increase the number of centres where the youth can get more information on safe sexual behaviour and HIV infections. Also, since Kibaha is a transit route for trunk roads that will exist for decades to come, it is advised that more posters and warnings of HIV/AIDS be placed in all business activities located in trunk roads.

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