Journal of
HIV/AIDS & Infectious Diseases

Review Open Access

The Drivers of HIV/AIDS Infection in Women of Reproductive Age in Kisumu City Kenya

Andrew Otieno Obondo

Uzima University College, Kenya

***Corresponding author:** Andrew Otieno Obondo, Uzima University College, Kenya, E-mail: opondoandy@yahoo.com, Tel: +254724307875

Received Date: September 02, 2019 **Accepted Date:** November 22, 2019 **Published Date:** November 25, 2019

Citation: Andrew Otieno Obondo (2019) The Drivers of HIV/AIDS Infection in Women of Reproductive Age in Kisumu City Kenya. J HIV AIDS Infect Dis 5: 1-11.

Abstract

Women and girls continue to be affected disproportionately by HIV in sub-Saharan Africa accounting for approximately 60% of HIV infections. In Kisumu city, the HIV prevalence in women continues to be very high but despite this some women living under the same conditions still test negative. The purpose of this study was to identify factors contributing to differential infection in HIV women of reproductive age. The target population was women who had undergone HIV testing in Health Facilities in Kisumu East district within the last 12 months before the initiation of this study or those recruited on exit after undergoing the test. The study used case-control study designs. The cases were women who tested positive while controls were those who tested negative. Quantitative data was collected using close-ended questionnaires and analyzed using univariate and multivariate regression analysis. The study found that the factors that contributed significantly to HIV infection in women were relationship power, education and mobility index. The study, therefore, concluded that female education is important is a determinant for condom use and must be considered in all programs dealing with HIV prevention in women of reproductive age.

Keywords: HIV/AIDS; Drivers; Women; Reproductive Age.

©2019 The Authors. Published by the JScholar under the terms of the Creative Commons Attribution License http://creativecommons.org/licenses/by/3.0/, which permits unrestricted use, provided the original author and source are credited.

Introduction of the HIV Epidemic

The Human Immune Deficiency (HIV) pandemic is a disease which despite increased knowledge in its mode of transmission has seriously impacted morbidity and mortality mostly in developing countries, reversing the gains achieved in the past in communicable disease control. According to the latest statistics published at the end of 2010, people living with HIV totalled 34 million which was higher than the 2009 figure of 33.3 million implying that the epidemic was rising [1]. Although the number of new infections has been falling, levels of new infections overall are still high and with the significant reduction in mortality, the number of people living with Human Immune Deficiency Virus/ Acquired Immune Deficiency Syndrome (HIV/AIDS) worldwide has increased [2].

Sub-Saharan Africa remains the most heavily affected region and accounted for 68% of all new HIV infections in 2008. Halting further expansion of the HIV pandemic within the next decade is a top priority of governments and civil society the world over and one of eight Millennium Development Goals set by the United Nations (Project, 2005). To achieve this goal preventive effort must concentrate on reducing women's risk of acquiring HIV infection. Although stabilization of the HIV/ AIDS epidemic has been noted in the last few years, the infection continues to spread rapidly in actual numbers [3].

Research questions

1. What are the risk factors that drive the HIV epidemic in women?
2. Which of these factors are responsible for the differential infection in women
3. How can these factors be mitigated to reduce the risk of infection in women

Broad Objective

To determine the factors that drive the HIV epidemic in women and how they can be mitigated

Specific objectives

To identify the risk factors that are driving the HIV epidemic in women of reproductive age

To determine which of these can be mitigated to reduce the infection rates in women

Literature Review

Introduction

Many studies have revealed that the prevalence of the HIV infection and its impact on women is greater than that of men and many preventive models have failed to mitigate its spread. Women are disproportionally affected by HIV and in 2008/09 alone HIV prevalence among women was twice as high as that for men at 8 percent and 4.3 percent respectively. According to Joint United Nations Programme on HIV/AIDS [3], about 17 million women were living with HIV compared to 15.9 million for 2009 meaning that instead of falling the rate of HIV infection seemed to be rising [4]. This disparity is even greater in young women aged 15-24 who are four times more likely to become infected with HIV than men of the same age [5]. It is thought that the high rates of sexual violence that Kenyan women experience is a contributing factor to the high prevalence rates. This thinking is supported by a nationwide survey conducted in Kenya in 2003 which revealed that almost half of the women interviewed reported having experienced some kind of sexual violence and a quarter of women aged between 12 and 24 reported losing their virginity by force [6]. Early prevention methods which were primarily information based were intended to meet the urgent need for risk education services [7]. The assumption was that a greater understanding of the behaviours associated with HIV transmission would most likely result in the adoption of HIV reduction health behaviours. But despite an increase in public awareness of HIV transmission, there was no significant change in high HIV risk behaviours.

Literature suggests that while information about HIV risk is necessary, it is not sufficient to motivate behaviour especially when these motivating behaviours are poorly understood. Ross and Deverell assumed that by changing behaviours, HIV risk could be reduced since HIV infections are largely transmitted through unsafe sexual behaviours [8]. They also acknowledged that risky behaviours, responsible for HIV infection occurred in the context of people's interpersonal relationships and posed many social, psychological and cultural obstacles in curbing the pandemic. Therefore, they believed that health promotion interventions were more likely to be effective if they encouraged associated changes at the level of the individual, the community and the wider social environment. The present section reviews literature that attempts to account for unchanged risky sexual behaviours in the face of a high prevalence of HIV/AIDS.

Rosenthal, Tanner, Short, and Zimet assert that efforts aimed to change sexual behaviour are not sufficient to maintain safe sex practices [9]. They acknowledge the fact that sex education on its own initially influences sexual behaviour, but cannot be maintained on long-term follow-up. Like any high-risk behaviour (such as smoking), the process of change can be a long and a difficult one with many relapses.

Gender

Researchers suggest that there is a link between men's use of violence and their sexual risk-taking [10]. Studies have shown that gender power inequities play a key role in the HIV epidemic through their effects on women's power in sexual relationships. Women are believed to face social pressures from insisting on the use of condoms during penetrative sex, as men seem to lose trust in such women and perceive them as promiscuous. Also, it has been suggested that there was also an implication of distrust associated with condom use and discussion of condom use sometimes construed as a sign of infidelity which could also spark verbal attacks and physical violence [11]. Consequently, this resulted in women feeling afraid to discuss or negotiate condom use and placed them at risk for HIV. Furthermore, the previous also showed that men with more traditional attitudes towards gender roles were more inclined not to use condoms consistently [12]. Some of the negative attitudes indicated that men believed condom use interfered with their sexual pleasure as well as their masculinity during sexual intercourse and therefore most of them opposed condom use during sexual intercourse [13].

Gender has become a major conceptual tool for understanding the evolving HIV pandemic globally and some researchers think that it explains the relationship between men and women [14] and that power imbalances between men and women contribute to the spread of the HIV infection [15]. It was thought that lack of sexual power led to reduced access to health services, lack of access to health information [16], lack of resources [17], stigmatization [18], politics and policy issues [19], sexual behaviour of their partners and relations with older partners [20].

Apart from poor governance and HIV, there was a clear pattern of association between income inequality as measured by the Gini coefficient and HIV prevalence across some countries in sub-Saharan Africa, countries with greater inequality having higher HIV prevalence [21]. However, some of the countries with the highest inequality and HIV prevalence, such as Botswana, South Africa, and Namibia, had low levels of domestic corruption as measured by the regional corruption perceptions index published by Transparency International and were regarded as having reasonably good governance [22]. Meanwhile, some countries that have high levels of corruption according to this index, such as Kenya and Côte D'Ivoire, had lower but still very significant HIV prevalence, suggesting that inequality is a stronger predictor of HIV prevalence than poor governance. One possible consequence of this apparent association between inequality and HIV is that economic growth that is not pro-poor and that led to greater income inequality may fuel the HIV epidemic [23].

This result also appeared to apply to gender income inequality at the household level and more generally where women's economic and social safety is largely dependent on their partners' occupations and status they had little choice in determining their sexual safety [24]. A study in Kenya had found that higher gender inequality between young women and adult men was significantly and strongly correlated to positive HIV status [25]. This human rights approach asserted that the marginal social location and low status of women in many societies explained their weakening ability to protect themselves from the virus [26]. The expectation was that countries with relatively high levels of gender inequality should report high HIV prevalence rates. This simplistic view had been disputed by some researchers who found that gender equality did not correlate with higher HIV prevalence among adult women in parts of sub-Saharan Africa [27]. This meant that other factors explained the spread of HIV infection in women in sub-Saharan Africa and not necessarily the simplistic view of inequality as had been previously proposed.

Socio-economic status

According to a report by the United Nations Development Fund for Women [28], the socioeconomic status of women and girls placed them at greater risk for acquiring HIV and could lead to harsher consequences of the HIV/AIDS epidemic. It was thought that women's and girls' lack of access to productive resources reduced their ability to negotiate condom use, to leave abusive relationships and to exchange sex for material goods (often called "transactional sex"). Whether this was the driving force of HIV infection in Kenya had not been well documented. Some authors [29] had even found no relationship between wealth and HIV infection.

Culture and Behaviour

The fight against AIDS in Africa was often presented as a fight against cultural barriers [30] that were seen as promoting the spread of HIV but this view had been contested by other researchers [31] and other researchers. The role of socio-cultural factors in the spread of HIV infection had not been clearly defined and this study intended to do this. It was clear from the above views that attention on knowledge as being the key to behaviour change failed to acknowledge both the culture in which people lived and the context in which the behaviour needed to

occur. Thus, addressing the socio-cultural influences on risky and preventative behaviour would, therefore, prove to be the most effective HIV prevention strategy among young adults.

Alcohol and substance abuse

Ao and other researchers investigated the risk factors of alcohol problem drinking among female bar/hotel workers in Moshi, Tanzania. In women who were classified as having probable or definite problems with drinking alcohol, the main characteristics associated with it included having several sexual partners, failure to use of a condom in the last sexual encounter, history of transactional sex and having more pregnancies. It was recommended that interventions that combined alcohol and sexual risk reduction counselling were urgently needed in this population of women [32].

Gender-based violence

Sexual violence targeted at women resulted in many negative consequences for their health and well-being as it had become a public health and human rights problem throughout the world [33]. The experience of violence affects the risk of HIV and other sexually transmitted infections (STIs) directly when it interfered with women's ability to negotiate condom use [34]. In countries where the HIV prevalence was high and women's social status low, the risk of acquiring HIV infection through sexual violence was high [35]. According to Dunkle, high rates of HIV infection were found in women who were physically abused, sexually assaulted or dominated by their male partners. The study also produced evidence that abusive men were more likely than non-abusers to be HIV-positive [36].

From the literature reviewed we identified several factors involved in the causation of HIV infection that together with intermediary factors made the women population vulnerable to HIV infection. Based on the literature the factors that increased HIV risk included gender issues, lack of access to health services for HIV/STI prevention, limited access to formal education, skill development, and critical information, intimate partner violence (IPV), inequality and the negative consequences of migration prompted by insufficient economic resources. Because of their condition and constrain the so-called choices available to vulnerable women and girls these factors might be directly linked to sexual risk-taking behaviours. These factors broadly shaped the kinds of alternatives available and influenced decision-making abilities profoundly increasing or decreasing the risk of HIV infection in women and girls.

The presence of this vulnerability hindered the likelihood of behaviour change and therefore increased the chances of HIV infection for women. This study will try to identify the factors that drive the HIV epidemic in women which makes it difficult for them to adopt preventive measures.

Methods

Introduction

The study used primary data obtained using structured questionnaires administered to the respondents by trained research assistants. Kisumu East District was purposively selected because of its high prevalence of HIV infection in women. The units of the study population were women attending ANC facilities and comprehensive care centres in the district. The analysis was done at two levels according to the frameworks. In the first instance, background factors were compared to outcome variables and then with the modifying factors and finally the relationship between the modifying factors and outcome variables assessed.

Study Area and Design

The study area was Kisumu East District located in the western part of Kenya at the western shores of Lake Victoria the second largest freshwater lake in the world with a population of nearly half a million with an area of 417 square kilometers. The district is densely populated with a male to female ratio of 1:1 and annual population growth of 2.8%. The HIV prevalence rate ranges from 15-18.4% and a poverty rate estimated at 55-63%. This was a case-control study that compared different risk factors among women who tested HIV positive against those who tested negative.

Study Population

The study population was women tested in four selected health facilities within the Kisumu East district within the last twelve months before data collection. The questionnaires were administered by the researcher and his representatives and each took approximately 45 minutes to be completed. The study was conducted between the months of August to December 2017. The population was selected from the women who had already been tested using the rapid diagnostic tests as per the WHO protocols and were not retested when being recruited into the study as they already knew their HIV status. One hundred study participants were recruited from each facility to bring the total to 400. Out of this total number, half of them were controls and the other half cases. The reason for selecting this population of women is that their HIV status was already known without subjecting them to further tests and because they lived within the same dis-

trict and the same environment there was very little variability among them.

The target population was women who had undergone HIV testing recruited as they attend ANC and patient support centres provided they were tested within twelve months before the study. The ANC clients were matched with the ANC controls while those from the comprehensive care centres were also similarly matched. Matching was also done by residence so that those from rural sites were matched to controls from the same areas. The cases were women who tested positive while the controls were those who tested negative.

Sample size calculation

The sample size was calculated using the formula published by the research division of the National Education Association as shown below:

s = X 2NP (1– P) ÷ d 2 (N –1) + X 2P (1– P).

(s = required sample size. X2 = the table value of chi-square for 1 degree of freedom at 95% confidence level 1.962 (3.841); N = the population size; P = the population proportion (assumed to be .50 since this would provide the maximum sample size) and d = the degree of accuracy expressed as a proportion (.05). Using this formula the sample size was 380.

Sampling

The sampling design was simple random sampling as the women were randomly selected as they attended care so long as they satisfied the criteria for selection. The women were interviewed randomly as they visited the health facilities for care until a total of 416 participants (208 cases and 208 controls) had been interviewed.

Data collection Tools

Structured questionnaires were administered by trained interviewers to women who had undertaken HIV tests according to the World Health Organization's rapid testing protocol. The questionnaires asked about social and demographic factors (age, education, current schooling, and earnings) and socio-economic status.

Ethical Issues

The study aimed at gathering information around HIV, which for many people was a sensitive topic as HIV touched the emotional and psychological aspects of all human spheres in society. For this reason, a debriefing sheet was included with all questionnaire packs. It provided a resource list for the person who may have needed additional psychological and emotional help.

Written informed consent was provided before enrolment into the study. Ethical approvals for the study were sought from Great Lakes University of Kisumu (GLUK) and provincial Medical officer of Health. The World Health Organization's guidelines on research on violence against women were adhered to. Being a retrospective study counselling services were available in case some participants could have needed them due to the effect of recalling memories that may have been buried in their subconscious.

Data Analysis

Return migrants were asked about the total years of their migratory experience and the number of towns in which they had stayed during their migration. The ratio of the number of migratory towns to years of total migration was calculated as an index of mobility. The mobility index with bigger values indicated higher levels of mobility (i.e., moving to a greater number of towns during a relatively short period of time). To minimize the effect of potential outliers (i.e., a few individuals who moved very frequently during a very short time period), the mobility index was divided into five approximately evenly distributed groups using the 20^{th}, 40^{th}, 60^{th}, and 80^{th} percentiles of its frequency distribution as thresholds.

A preliminary description of the data was done to determine the socio-demographic characteristics of HIV infection status among women in reproductive age attending Ante-Natal Clinic (ANC) at the health facilities of Kisumu city. The data was disaggregated to show the trends in the two different HIV status categories (Positive and Negative). Descriptive analysis (frequency and percentage).

The data was edited and then coded which included grouping and assignment of values to the various responses. Descriptive statistics were used to analyze the demographics. Data were analyzed using multivariate and regression analysis to show the effects of the modifying variables on HIV infection. Univariate logistic analysis was also performed for all the predictor variables.

Limitations of Study

Limitations of this research were the volunteer nature of the recruitment that allowed for the possibility of selection bias being introduced and being a case-control study there was also a possibility of recall bias during data collection. There could also have been some misclassification arising as a result of under-reporting of the sensitive sexual behaviour variables.

Results

Socio-demographic characteristics by HIV infection

Table 1 below shows the socio-demographic characteristics of the respondents. The majority of the respondents 149 (35.8%) were between the ages of 20 – 24 years old. The mean age of the respondents was 25 years old. Over half of the participants, 226 (54.3%) had primary and below level of education and 339 (81.5%) were married. Nearly half of the respondents 188 (45.2%) were unemployed and 98 (71%) had a high mobility index. The majority of the participants 328 (78.9%) had a good health condition and over three-quarters of the respondents, 332 (79.8%) had between 0 – 2 socioeconomic indexes (Table 1).

Effects of Modifying factors on HIV infection among women of reproductive age attending ANC health facilities

Table 2 shows the regression effects of Modifying factors on HIV infection among women of reproductive age attending ANC health facilities. The univariate analysis revealed that participants between the ages 30 – 34 and 35 – 39 years old (OR= 3.2; 95% CI, 1.5 – 6.8) and (OR= 9.3; 95% CI, 1.9 – 45.5) respectively were more likely to be HIV positive. Participants who had ever married (OR= 10.7; 95% CI, 1.3 – 84.3) compared to those who were married were more likely to be HIV positive. Similarly, those with a fair and poor health condition (OR=3.5; 95%CI, 2.0 – 6.2) and (OR=7.9; 95% CI, 1.7 -35.7) respectively when compared to individuals with a good health condition were more likely to be HIV positive. And respondents with higher levels of mobility (OR=3.1, 95% CI, 1.4 – 6.9) compared to those with low mobility were more likely to be HIV positive. However, there was no significant relationship between the level of education, occupation and socio-economic index to HIV infection status.

In the multivariate analysis; education, mobility index, and health conditions were significant predictors of HIV infection status. The participants who had a secondary level of education were less likely to be HIV positive as compared to those who had a primary level of education (AOR= 0.32; 95%CI, 0.11 – 0.97). The respondents who had a high mobility index were 4.9 times more likely to be HIV positive as compared to those who had low mobility index (AOR= 4.87; 95%CI, 1.89 – 12.54). And the participants with a fair health condition were 4.8 times more likely to be HIV positive as compared to those with a good health condition (AOR= 4.84; 95%CI, 1.49 – 15.70) (Table 2).

Discussion

Socio-demographic Characteristics of HIV infection Status

In the analysis, we sought to determine the socio-demographic Characteristics of HIV status among women attending care at health facilities within the Kisumu city. To determine the impact of these predictor variables on HIV risk reduction in women attending care centres, the univariate logistic analysis was performed for all the predictor variables. The results revealed that the ages between 30-34 and 35-39 years old respectively were more likely to be HIV positive. Other variables found to be positively associated with HIV infection included those who had ever married (OR 10.7) those with a fair and poor health condition (OR 3.5) and those with higher levels of mobility (OR 3.1). The study did not find any significant relationship between the level of education, occupation and socio-economic index to HIV infection status. Some of these factors found to be significantly associated with HIV infection had been investigated by other researchers. The age group aged 30-39 years is different from the 15-34 age group reported in other studies (37, 38, 39) for example a study done in Lesotho revealed that by the age of 24, almost 40 percent of girls were found to be HIV positive. This changing relationship between age and HIV may be an indicator that the preventive messages may be reaching the teenagers at school and making them adopt health behaviours that are preventive against HIV infection. It was thought that adolescents and young women were especially prone to HIV infection in comparison with older women due to the occurrence of larger areas of cervical ectopy in young women and an increased likelihood of trauma to the immature genital tract during sex. [40,41]. A study done in South Africa between 2002 and 2008 showed that the prevalence of HIV infection among South Africans over 20 years old has increased whereas the figure for those under 20 years old has dropped somewhat over the same period. This drop-in HIV infection amongst the older age group was attributed to the high condom use among the youth and which was lowest among old people. In this study, it was reported that more than 80% of men and more than 70% of women under 25 years old use condoms, and slightly more than half of men and women aged 25–49 claim to use condoms. Perhaps increased awareness and therefore condom use may explain what we have found in this study. This older age group is also the time most women are in the marital relationship and therefore begs the question as to whether getting into a marital relationship has anything to do with the study findings.

Socio-demographic Variable	HIV Infection Status		
	Cases (N=208) N (%)	**Control (N=208)** N(%)	**Overall (N=416)** N (%)
Age in Years:			
15 – 19	22 (39.3)	34 (60.7)	56 (13.5)
20 – 24	62 (41.6)	87 (58.4)	149 (35.8)
25 – 29	66 (51.2)	63 (48.8)	129 (31.0)
30 – 34	46 (51.2)	22 (32.4)	68 (16.4)
35 – 39	12 (85.7)	2 (14.3)	14 (3.3)
Education Level:			
Primary and below	104 (46.0)	122 (54.0)	226 (54.3)
Secondary	81 (56.6)	62 (43.4)	143 (34.4)
College and above	23 (48.9)	24 (51.1)	47 (11.3)
Marital Status:			
Married	164 (48.4)	175 (51.6)	339 (81.5)
Never married	34 (51.5)	32 (48.5)	66 (15.9)
Ever married	10 (90.9)	1 (9.1)	11 (2.6)
Occupation:			
Formal employment	24 (61.5)	15 (38.5)	39 (9.4)
Business	84 (52.8)	75 (47.2)	159 (38.2)
Unemployed	87 (46.3)	101 (53.7)	188 (45.2)
Student	13 (43.3)	17 (56.7)	30 (7.2)
Rural-Urban migration:			
Return migrant	68 (45.6)	81 (54.4)	149 (35.8)
Non-return migrant	140 (52.4)	127 (47.6)	267 (64.2)
Mobility index(n=138):			
Low Mobility	11 (27.5)	29 (72.5)	40 (29.0)
High Mobility	53 (54.1)	45 (46.9)	98 (71.0)
Health Condition:			
Good	142 (43.3)	186 (56.7)	328 (78.9)
Fair	54 (73.0)	20 (27.0)	74 (17.8)
Poor	12 (85.7)	2 (14.3)	14 (3.4)
Socioeconomic index:			
0 - 2	165 (49.7)	167 (50.3)	332 (79.8)
3 - 4	30 (47.6)	33 (52.4)	63 (15.1)
5 – 6	13 (61.9)	8 (38.1)	21 (5.1)

Table 1: Socio-demographic characteristics by HIV infection status among women of reproductive age attending ANC at health facilities of Kisumu city

Modifying factors	Cases	Univariate		Multivariate	
		uOR(95%CI)	pvalue	AOR(95%CI)	P-value
Age in Years:					
15 – 19	22 (10.6)	Ref.	Ref.	Ref.	Ref.
20 – 24	62 (29.8)	1.10(0.59– 2.06)	0.763	3.54(0.68-18.34)	0.132
25 – 29	66 (31.7)	1.62 (0.86 – 3.06)	0.139	4.9(0.96-25.14)	0.055
30 – 34	46 (22.1)	3.23 (1.54 – 6.76)	0.002*	16.06(2.71-95.09)	0.002*
35 – 39	12 (5.8)	9.27(1.89 – 45.48)	0.006*	21.03(1.41-314.54)	0.027*
Education level:					
Primary and below	104(50.0)	Ref.	Ref.	Ref.	Ref.
Secondary	81 (38.9)	1.53 (1.00 – 2.33)	0.047	0.59(0.24-1.41)	0.238
College and above	23 (11.1)	1.12 (0.59 – 2.10)	0.715	0.32(0.11-0.97)	0.044*
Marital Status:					
Married	164(78.9)	Ref.	Ref.		
Never married	34(16.4)	1.13(0.67 – 1.92)	0.641		
Ever married	10(4.8)	10.67 (1.35 – 84.27)	0.025*		
Occupation:					
Formal employment	24 (11.5)	Ref.	Ref.		
Business	84 (40.4)	0.70 (0.34 – 1.43)	0.329		
Unemployed	87 (41.8)	0.54 (0.27 – 1.09)	0.086		
Student	13 (6.3)	0.48 (0.18 – 1.26)	0.135		
Mobility Index:					
Low	11 (17.2)	Ref.	Ref.	Ref.	Ref.
High	53 (82.8)	3.11 (1.40 – 6.91)	0.005*	4.87(1.89-12.54)	0.001*
Health condition:					
Good	142(68.3)	Ref.	Ref.	Ref.	Ref.
Fair	54 (26.0)	3.53 (2.03 – 6.18)	0.000*	4.84(1.49-15.70)	0.009*
Poor	12 (5.7)	7.85 (1.73 – 35.67)	0.008*	0.67(0.05-8.89)	0.762
Socioeconomic index:					
5 – 6	13 (6.3)	Ref.	Ref.		
3 – 4	30 (14.4)	1.61 (0.25 – 1.51)	0.260		
0 – 2	165(79.3)	0.56(0.20 – 1.53)	0.282		

Table 2: Effects of Modifying factors on HIV infection among women of reproductive age attending ANC health facilities

*Significant at P<0.05, uOR; unadjusted Odd ratio, aOR; adjusted Odd ratio

This study has reported that more women who were infected with HIV were those who had ever married which include the widows and divorced/separated women. This finding is interesting because it conforms to other researchers who have reported that marital status especially early marriage is associated with increased risk of HIV infection [42, 43] argue that early marriage is associated with several behavioural and social factors that may increase the vulnerability of married female adolescents to HIV infection. The results also seem to conform to a study done in Nigeria that reported that HIV prevalence among currently married and never-married women was 3.4%, but was 5.9% among formerly married women [44].

The study has also established that respondents with higher levels of mobility (OR 3.1) compared to those with low mobility index were more likely to be HIV positive. These results corroborate the findings of a study by Carol [45] which found that the lifetime number of sexual partnerships was associated with a higher likelihood of being HIV-positive among female migrants than their male migrants or non-migrants. Another study was conducted on 1090 gender-matched interviews and rapid HIV testing with 545 couples proportionally representing all the different sizes of the fish-landing beaches in Kisumu County [46]. The results revealed that the mobility of fishermen's spouses is associated with HIV infection that is not evident among fishermen themselves. These findings suggest that the consequences of migration for HIV risk were particularly disadvantageous to women. These results underscore that women in sub-Saharan Africa are not static, passive recipients of HIV infection but because of migration are actively acquiring infection due to this practice. The association between migration and HIV infection in women may be synergistic in that migration may be associated with a higher likelihood of infection in women by exposing them to more risky sexual partnerships [47, 48].

Education, mobility index, and health conditions were significant predictors of HIV infection status. The results agree with those of a study done in South West Uganda that found a positive correlation between education and risk of HIV infection among women [49]. In this study, it was concluded that over a decade more educated young adults, especially females, are more likely to respond to HIV/AIDS information and prevention campaigns by effectively reducing their sexual risk behaviour. In another study conducted in Uganda in Second, the results supported the view that encouraging girls to stay in school delays their sexual debut and reduces their lifetime risk of acquiring HIV infection [50]. This study, therefore, confirms the findings of earlier studies that education has a positive role to play in HIV prevention among women of reproductive age.

The study has established that participants with a fair health condition were 4.8 times more likely to be HIV positive as compared to those with a good health condition (AOR= 4.84). This implies that women who are HIV positive even without knowing their HIV status could feel that they are not well. This finding may be useful in that it may be used as a point of entry for HIV testing and therefore HIV prevention education.

Conclusions and Recommendations

Conclusions

This study has shown that the most important risk factors in the transmission of HIV infection in women of reproductive age is female education and the mobility which coupled with perceived seriousness of the infection and sexual relationship power determined whether one was HIV positive or HIV negative. Although women have the power to use condoms many of them still don't use them consistently.

Recommendations

Based on our findings we recommend the strengthening of IE/BCC program advocating the benefits of condom use as a method of prevention of HIV infection in women. It is recommended that messages used should emphasize the seriousness of HIV infection and the benefits of female education in the reduction of HIV transmission in women of reproductive age. In conclusion, therefore, HIV program planners and policymakers must understand the importance of focussing on these two major issues if we want to reduce transmission of HIV infection in women.

References

1. UNAIDS (2010) *Country Progress Report - Kenya Office of the President.* Nairobi: Ministry of Special Programmes.
2. UNAIDS (2010) Report on the Global Aids Epidemic 2010. Joint United Nations Programme on HIV/AIDS, Geneva.
3. UNAIDS (2012) Report on the Global Aids Epidemic 2012. Joint United Nations Programme on HIV/AIDS, Geneva.
4. UNAIDS (2010) Report on the Global Aids Epidemic 2010. Joint United Nations Programme on HIV/AIDS, Geneva.
5. UNGASS (2008) *Country progress report.* Nairobi: Ministry of special programs.
6. UNGASS (2010) *Country progress report.* Nairobi: Ministry of special programs
7. Ross E. and Deverell A (2010) Health, illness, and disability: psychosocial approaches. Hatfield, Pretoria: Van Schaik Publishers.
8. Ross E and Deverell A (2010) Health, illness, and disability: psychosocial approaches. Hatfield, Pretoria: Van Schaik Publishers.
9. Tanner AE, Short MB, Zimet GD, Rosenthal SR (2009) Research on adolescents and microbicides: A review. Journal of Paediatric and Adolescent Gynaecology 22: 285-291.
10. Smriti Agarwal S, Pedro de Araujo (2012) On the association between HIV knowledge and unsafe sexual behaviour in India. International Journal of Development Issues.

11. Tapia-Aguirre V, Arillo-Santillan E, Allen B, Angeles-Llerenas A, Cruz-Valdez A, et al. (2003). Associations among condom use, sexual behavior, and knowledge about HIV/AIDS. A study of 13, 293 public school students. Mexico.

12. Muchiri E, Odimegw C, Nicole De Wet (2017) HIV risk perception and consistency in condom use among adolescents and young adults in urban Cape Town, South Africa: a cumulative risk analysis.
13. Muchiri E, Odimegw C, Nicole De Wet (2017) HIV risk perception and consistency in condom use among adolescents and young adults in urban Cape Town, South Africa: a cumulative risk analysis.
14. Wand H, Ramjee G (2012) The relationship between age of coital debut and HIV seroprevalence among women in Durban, South Africa: a cohort study. Journal of Infectious Diseases Research 2 (1)
15. Rachel Jewkes, et al. (2010) "Intimate Partner Violence, Relationship Power Inequity, and Incidence of HIV Infection in Young Women in South Africa: A Cohort Study, "*The Lancet* 376, no. 9734: 41-48.
16. Kreuter, MW (2015) Rethinking Perceived Risk and Health Behaviour: a Critical Review of HIV Prevention Research", Health Education and Behaviour, 24, 3: 313-325.
17. Nall A, Chenneville T, Lindsey M and Jennifer LO (2017) Factors Affecting HIV Testing among Youth in Kenya. International Journal of Environmental Research and Public Health.
18. Lichtenstein B (2004) Stigma as a barrier to treatment of sexually transmitted infection in the American deep South: Issues of race, gender, and poverty. Social Science & Medicine 57: 2435-2445.
19. Saguier M (2007) The hemispheric social alliance and the free trade area of the Americas process: The challenges and opportunities of transnational coalitions against neo-liberalism." *Globalisation* 4: 251-265.
20. Hempson D & O' Don ovan M (2005) Putting numbers to the scorecard: presidential targets and the state of delivery. In S. Buhlungu et al (Eds). State of the Nation: South Africa. Pretoria: HSRC Press.
21. Wathula J (2016) Gender inequality dynamics in the prevention of a heterosexual HIV epidemic in sub- SaharanAfrica. Afr J AIDS Res (AJAR) 15: 55–66.
22. Gillespie SR, Kadiyala S, Greener R (2007) Is poverty or wealth driving HIV transmission? *Journal of AIDS*, S5-S16.
23. Gillespie SR, Kadiyala S, Greener R (2007) Is poverty or wealth driving HIV transmission? *Journal of AIDS*, S5-S16.
24. Francisco L, Abramsky T, Kiss L, et al. (2013) Violence against women and HIV risk behaviours in Kampala, Uganda: Baseline findings from the SASA! Study. Violence Against Women 19: 814–832.
25. Beegle K, Ozler B (2007) *Young women rich(er) men and the spread of HIV.* Washington DC: World bank.
26. Wabiri N, Taffa N (2013) Socio-economic inequality and HIV in South Africa. *BMC Public Health,*13, (1037)
27. Berit Gerritzen B (2016) Women's Empowerment and HIV Prevention in Rural Malawi. Journal Feminist Economics 22 (3).
28. Muriisa K, Roberts B (2016) Gender and HIV/AIDS in Eastern and Southern Africa: Rethinking Men and HIV/AIDS Mitigation Uganda and Rwanda. Rwanda Journal Series B: Social Sciences 3.
29. Hargreaves JR (2013) Incorporating a Structural Approach Within Combination HIV Prevention: An Organising Framework. Structural Approaches to HIV Prevention. Position Paper Series. USAID's AIDS Support and Technical Assistance Resources.
30. Lugalla J, Emmelin M, Mutembei A, et al. (2004) Social, cultural and sexual behavioral determinants of the observed decline in HIV infection trends: lessons from the Kagera region, Tanzania." *Journal of science and medicne* 59: 185-198.

31. Sovran S (2013) Understanding culture and HIV/AIDS in

sub-Saharan Africa. SAHARA Journal 10: 32–41.

32. Ao T, Sam N, Masenga E, Seage G & Kapiga S (2006) Human immunodeficiency virus type 1 among bar and hotel workers in northern Tanzania: The role of alcohol, sexual behaviour, and herpes simplex virus type-2*Sexually Transmitted Diseases 33*: 163–169.

33. Hassen F & Deyassa N (2013) The relationship between sexual violence and human immunodeficiency virus (HIV) infection among women using voluntary counselling and testing services in South Wollo Zone, Ethiopia. BMC Research Notes 6: 271.

34. Durevall D, Lindskog A (2015) Intimate partner violence and HIV in ten sub-Saharan African countries: What do the demographic and health surveys tell us? Lancet Glob Health 3: 34-43.

35. Dunkle KL, Jewkes Rk, et al. (2004) Gender-based violence, relatioship power and risk of HIV infection in women attending antenatal clinics in South Africa. *Lancet* 363: 1415-1421.

36. Jewkes RK, Dunkle K, Nduna M, Shai N (2010) Intimate partner violence, relationship power inequity, and incidence of HIV infection in young women in South Africa: A cohort study. Lancet 376: 41- 48.

37. UNAIDS (2018) Report on the Global Aids Epidemic 2018. Joint United Nations Programme on HIV/AIDS, Geneva.

38. CDC (2017) *Basic statistics-Cumulative AIDS cases.* Washington DC: Centers for Disease Control and Prevention.

39. UNICEF (2018) Annual report- Programme results achieved by contributions received from partners.

40. Marylyn M Addo MM & Altfeld M (2014) Sex-Based Differences in HIV Type 1 Pathogenesis. *The Journal of Infectious Diseases* 209: S86–S92.

41. Nakazwe C, Michelo C, Ingvild FS & Fylkesnes K (2019) Contrasting HIV prevalence trends among young women and men in Zambia in the past 12 years: data from demographic and health surveys 2002–2014 *BMC Infectious Diseases* 19.

42. Gita Ramjee & Brodie Daniels (2013) Women and HIV in Sub-Saharan Africa. *AIDS Research and Therapy*10.

43. Singh S, Darroch JE & Bankole A (2004) The role of abstinence, monogamy and condom use in HIV decline. The Alan Guttmacher Institute, Washington DC.

44. Fagbamigbe AF, Adebayo SB, Idemudia E (2016) Marital status and HIV prevalence among women in Nigeria: Ingredients for evidence-based programming. *International Journal of Infectious Disease* 48: 57-63.

45. Carol V H, Marie-Louise N, McGrath TB & Rachel CS (2010) Gender, Migration, and HIV in rural KwaZulu-Natal, South Africa.

46. Kwena ZA, Camlin CS, et al. (2013) Short-Term Mobility and the Risk of HIV Infection among Married Couples in the Fishing Communities along Lake Victoria 8: e54523.

47. Carol VH, Marie-Louise N, McGrath TB, Rachel CS (2010) Gender, Migration, and HIV in Rural KwaZulu-Natal, South Africa.

48. Crush J, Frayne B, Grant M (2006) *Linking migration, HIV/AIDS and urban food security in southern and eastern Africa.* Washington DC: International Food Policy research Institute.

49. De Walque D, Nakiyingi-Miiro J, Busingye J & Whitworth J (2005) Changing association between scholing levels and HIV-1 infection over 11 years in a rural population cohort in South-West Uganda." Journal of tropical medicine and international health 10: 993-1001.

50. Marcella M Alsan, David M Cutler (2012) Girls' education and HIV risk: Evidence from Uganda. *Journal of Health Economics* 32: 863– 872.

Submit your manuscript to a JScholar journal and benefit from:

- Convenient online submission
- Rigorous peer review
- Immediate publication on acceptance
- Open access: articles freely available online
- High visibility within the field
- Better discount for your subsequent articles

Submit your manuscript at
http://www.jscholaronline.org/submit-manuscript.php