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Determinants of HIV Testing Among Sexually Active Young People in Zambia

Menon, Anitha J.

Department of Psychology

University of Zambia, Zambia

Email: anithamenon316@gmail.com

Phone +260977846116

Mwaba, Sidney O. C.

Department of Psychology

School of Humanities and Social Sciences

University of Zambia, Zambia

Email: sidneymwaba56@gmail.com

Phone: +260-975-496346

Thankian, Kusathan

Department of Gender Studies

School of Humanities and Social Sciences

University of Zambia, Zambia

Email: kusanth@yahoo.com

Phone: +260-977-794730

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Abstract

This study used data from the 2013 Zambia Demographic Health Survey (ZDHS) based on a nationally representative sample carried out by Central Statistical Office of Zambia. This paper analyzed a special module designed to collect information on the extent of the uptake of HIV testing by sexually active young people in Zambia. The analysis of this paper is based on 1879 young women aged 15-19 and 2747 aged 20-24 years respectively. Their male counterparts were 1675 aged 15-19 and 2005 aged 20-

24 years. Overall 84% of females and 57% of males reported having tested for HIV. Regression analysis further showed that age, place of residence, work status, educational level, consistency of condom use and number of sex partners were significantly related to the uptake of HIV testing for both female and male participants. Young sexually active people should be availed affordable educational opportunities which in turn will hopefully accord them to viable economic opportunities. The media exposure to the young men and women should preach consistent condom use as well as a reduction in their sexual partners.

Key Words: HIV testing; Sexually active; Condom use; Prevalence

Introduction

HIV and AIDS are two of the world's major public health issues, with sub-Saharan Africa being the most affected region. In 2015, it was estimated that 36.7 million people were living with HIV and AIDS, of whom 25.5 million were living in sub-Saharan Africa (UNAIDS, 2016). The introduction of rapid HIV antibody tests has facilitated HIV diagnosis of people worldwide, especially those in low-income countries (Zachary et al., 2012). HIV-testing is a critical step in HIV treatment cascade (diagnosis, linkage to care, engagement in care, retention in care, initiation of antiretroviral therapy, and viral suppression) (Thierman et al., 2006). In 2007 the World Health Organization (WHO) recommended routine HIV testing among youth in epidemic settings, and many countries in sub-Saharan Africa proposed to mobilize youth and to ensure 'youth friendly' HIV testing services (WHO, 2007).

Studies using mathematical models have suggested that almost 50 % of new HIV infections occur in persons who are unaware of their HIV status (Marks et al. 2006). Therefore, HIV testing provides an opportunity for people to find out their HIV status which may influence changes in HIV risk behaviour, thus helping to reduce the spread of HIV (Cawly et al. 2014). In addition, HIV testing also leads to early diagnosis and treatment which are associated with good illness outcomes (Gainella et al. 2011), while delayed diagnosis and treatment increase the disease burden and represent missed opportunities in terms of prevention (Miro et al. 2011).

In Zambia HIV prevalence rates peaked to 28% in the late 1990s and declined by over 25% between 2001 and 2009 (Kapata et al.2012). By 2015, it was estimated that 1.2 million people were living with HIV and AIDS in Zambia (Zambia national AIDS Council, 2015). An HIV prevalence of 12.9% among adults aged 15-49 years old makes Zambia one of top 10 countries with the highest HIV prevalence in the world (Zambia national AIDS Council, 2015). Zambia has implemented diverse programs to prevent new infections and improve HIV treatment for those infected (Zambia national AIDS Council, 2015). The scale-up of HIV-testing service is one of the effective national strategies to halt the epidemic.

Despite the high HIV prevalence, youth testing rates are low (MacPhail et al. 2009). In Zambia, testing rates have been the lowest for many years among adolescents. HIV-testing rate was positively associated with education attainment, but did not differ regarding geographic location or sexual activity. Urban population, male participants, and people perceived with high risks were more willing to take the test. In rural area,

Voluntary Counseling and Testing (VCT) use did not differ by gender, while in urban area, men used the service more than women (Fylkesnes, 1999).

Another study in Zambia by Fylkesnes and Siziya (2004) found that testing rate was positively related to the years of education except for two age groups (<8 years vs. >12 years of schooling). The readiness for VCT was higher in age group 20-24 (49%) than in age group 40-49 (23%). Factors positively associated with readiness for VCT were: 15-24 years of age: self-perceived risk of being HIV infected, 25-49 years of age: poor self-rated health and previous test experience. Barriers to VCT among Zambian population included fear and burden of knowing their status, stress and detriment to health, concern of losing future opportunity for education, work and marriage (Jurgensen et al., 2012).

A South African study found that, the low HIV testing rate was in contrast to the high HIV prevalence, among those who were tested, and this discrepancy held across all age groups for each gender (Ramirez-Avila et al. 2012). Studies carried out in Africa suggest individual level factors independently associated with having been tested for HIV include being sexually active, having a boy/girlfriend, never been married, willing to pay for test, risk perception and knowledge about HIV, having ever talked to the mother or female guardian about HIV, and having ever been pregnant or made someone pregnant (Asante et al. 2013; Dirar et al. 2013; Peltzer et al. 2013; Tsegay et al. 2013). A study from Ethiopia, found that perceived stigma associated with positive test results was a significant predictor of low utilization of HIV testing (Tsegay et al. 2013). Other factors, including stigma, distance to testing facilities and concerns regarding accuracy and confidentiality of test results have often been identified for the low HIV testing rates among youth in sub-Saharan Africa (Kalichman and Simbayi, 2003; Kabiru et al., 2010).

Studies have also identified risk perceptions or sense of invulnerability of youth as a major barrier to HIV testing (Tenkorang and Maticka-Tyndale, 2013). Other studies have also documented associations between knowing a person who has died of HIV and AIDS and behavioral change (Tenkorang and Maticka-Tyndale, 2013). In order to improve HIV testing uptake among the youth, it is critically important to know factors affecting it so that they can be addressed through targeted interventions. This study explored factors associated with uptake of HIV testing by young people in Zambia.

Methodology

The present study used data from the 2013 Zambia Demographic Health Survey (ZDHS). The survey was based on a nationally representative sample carried out by the Central Statistical Office with technical assistance from the Demographic Healthy Surveys Programme at ICF International which was funded by the United States Agency for International Development (USAID). The survey used a two-stage stratified cluster sampling design. At the first stage, 722 Enumeration Areas (EA) were selected using systematic random sampling with probability proportional to size. At the second stage, 25 households per EA were selected again using systematic random sampling. Methods and data collection procedures have been published elsewhere (ZDHS, 2014).

The ZDHS included a special module designed to collect information on various demographic and health indicators including individual characteristics, sexual activity, knowledge and use of condoms, HIV/AIDS related knowledge, HIV testing, attitudes and behaviour. The household questionnaires also collected information on the demographic and economic characteristics of all household members. In this study, the analysis was restricted to sexually active youths in order to specifically look at the update of HIV testing among the youth in Zambia.

Data Analysis

The data analysis was carried out in two stages. Firstly, cross tabulations were used to examine the relationship between the independent (socio-economic and demographic variables) and dependent (update of HIV testing) variables. For the statistical analysis, chi-square tests were conducted at the bivariate level for independent variables at $p < 0.01$ and $p < 0.05$ significant level. Secondly, the linear logistic regression was used to identify factors influencing the update of HIV testing by considering socio-economic and demographic variables. The result of the logistic regression models was converted into odd ratios, which represented the effect of a one-unit change in the explanatory variable on the indicator of the update of HIV testing. Odds ratios larger than one indicates a greater likelihood of testing for HIV from the reference category; odds ratios smaller than one indicates a smaller likelihood compared to the reference category.

Results

Background characteristics of the sample

The background characteristics of the sample are shown in Table 1. The results revealed that 40.6% of females and 45.5% of males were in the age group 15-19 and 35% of females and 40% of males were aged 20-24 respectively. With regard to religion, the majority of the respondents were Protestants (78% of males and 82% of females) while the minority were Catholic (21.6% of males and 17.6% of females). The results also showed that about half of the respondents were from rural areas (47.3% of females and 47.1% of males). The distribution of respondents by wealth quintile showed that 37.7% of females and 32.7% of males were ranked poor, 22.2% of females and 23.3% of males were categorized as belonging to the middle class whereas 40% of females and 44.1% of males were ranked rich. The data further shows that majority of the respondents whether female or male were not working (62.4% of females and 41.3% of males).

The education characteristics of the respondents showed that 56.6 % of females and 64.6 % of males had completed secondary or higher education whereas 43.4% of the females and 35.4% of the males had only acquired primary education. Furthermore, 66.4% of females and 56% of males reported having been exposed to media less than once a week. On the contrary, 33.6% of the females and 44.4% of the males reported having had access to media at least once a week. With regard to risk perception of getting HIV, 57.3% of females and 64.7% of males reported low or no risk, 26% of females and 18.7% of males reported medium risk while 16.7% of females and 16.5% of males reported being at high risk of getting HIV. On consistency of condom use with all partners, 88.4 % of females and 75.2 % of males reported not having used condoms

consistently with their partners whereas 11.6% of females and 24.8% of males reported having used condoms consistently with their partners.

Table1: Sample Distribution of sexually active males and females

Characteristics	Female	N	Male	N
Age				
15-19	40.6	1879	45.5	1675
20-24	59.4	2747	54.5	2005
Religion				
Catholic	17.9	836	21.6	808
Protestant	82.1	3790	78.4	2812
Place of residence				
Rural	47.3	2186	47.1	1734
Urban	52.7	2440	52.9	1946
Wealth Index				
Poor	37.7	1746	32.7	1202
Middle	22.2	1029	23.3	856
Rich	40.0	1851	44.1	1622
Work status				
Not-working	62.4	2883	41.3	1521
Working	37.6	1743	58.7	2159
Educational level				
Primary	43.4	2008	35.4	1305
Secondary or higher	56.6	2618	64.6	2375
Exposure to media				
Less than once a week	66.4	3073	56.0	2060
At least once a week	33.6	1553	44.0	1620
Perceived risk of getting HIV				
Low or no risk	57.3	2643	64.7	2377
Medium risk	26.1	1199	18.7	687
High risk	16.7	784	16.5	616
Used condom consistently with all partners				
No	88.4	4090	75.2	2766
Yes	11.6	536	24.8	914
Number of partners had sex				
One	52.7	2437	25.9	950
Two	29.1	1350	21.3	783
Three or more	18.2	839	52.8	1947
Would buy vegetables from vendor with HIV				
No	24.2	1121	20.1	746
Yes	75.8	3495	79.9	2934

Respondents were asked how many partners they had sex with, 52.7% of females and 26% of males reported having had sex with one partner, 29% of females and 21% of males reported having had sex with two partners yet 18% of females and 52% of males reported having had sex with three or more partners. Respondents were also asked whether they would buy vegetables from a vendor with HIV, the majority of the

respondents (75.8% of females and 79.9% of males) reported that they would buy vegetables from a vendor with HIV.

HIV Testing

The percentage of youths who reported having tested for HIV is shown in Table 2. Overall, 84% of females and 57% of males reported having tested for HIV. Female respondents aged 20-24 (92.6%; males 69.5%) were more likely to report having tested for HIV compared to those aged 15-19 (70.8%). Similarly, males aged 20-24 (69.5%) were more likely to report having tested for HIV compared to those aged 15-19 (42.0%). With regard to place of residence, females from rural (85.6%) were more likely to report having tested for HIV as compared to those from urban areas (82.1%). In like manner, males from rural areas (63.6%) were more likely to report having tested for HIV as compared to those from urban areas (51.1%).

Figure 1. Percentage of youths who underwent HIV testing by age

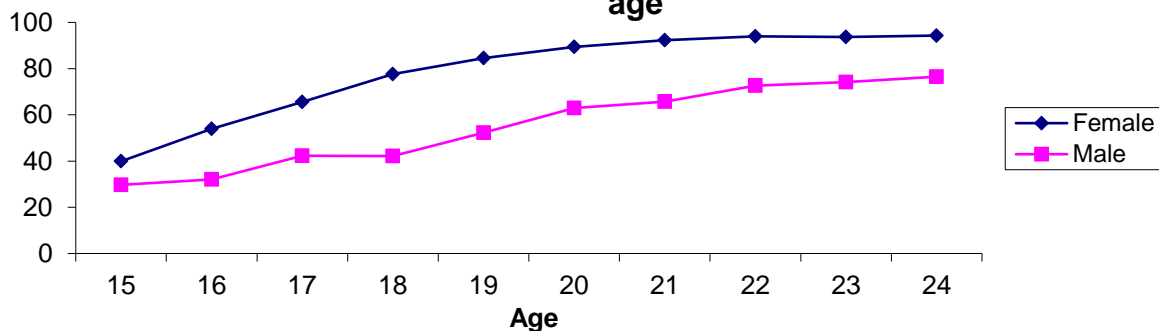
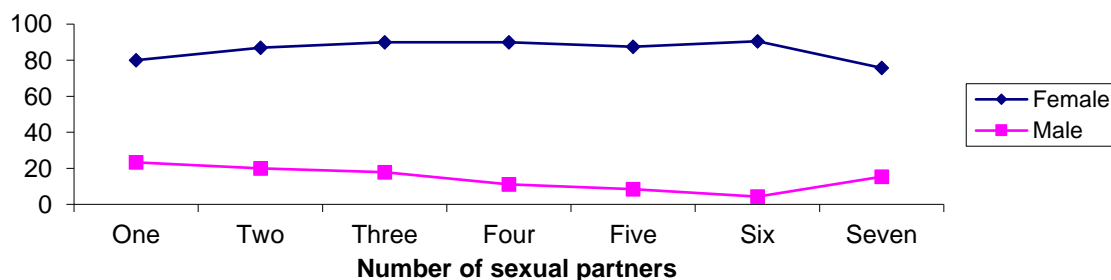


Figure 2. Percentage of youths who underwent HIV testing by number of sexual partners



In terms of religion, females who were Protestants (84.2%) were more likely to report having tested for HIV as compared to those who were Catholic (81.8%). The data further indicated that, males from rich background were more likely to report having tested for HIV (64.5) compared to those from middle (50.6%) and poor (51.3). Females who were working (87.6%) were more likely to report having tested for HIV as compared to those who were not working (81.6%). In the case of males, those who were working (58.7%) were more likely to test for HIV as compared to those who were not working (54.6%). The data further indicated that females with secondary or higher

education (86%) were more likely to report having tested for HIV as compared to those who only had primary education (81%).

Similarly, males with secondary or higher education (65.5%) were more likely to have tested for HIV as compared to those who only had primary education (41.5%). In terms of exposure to media, those who were exposed to media at least once in a week were more likely to report having tested for HIV (59.7) as compared to those who were exposed to media less than once a week (54.8). Female respondents who perceived high risk of getting HIV (87.5%) were more likely to test for HIV as compared to those who perceived getting HIV at medium risk (85.8%) and low risk (82.5%). Female respondents who reported inconsistent condom use with their partners (84.7%) were more likely to report having tested for HIV as compared to those who reported using condoms consistently with all partners (76%). On the contrary, males who had used condom consistently with all partners (67%) were more likely to report having tested for HIV as compared to those who reported using condoms inconsistently with all partners (53.7%).

Table 2. Percentage of sexually active males and females who reported having ever tested for HIV

Characteristics	% females who report having ever tested for HIV		% males who report having ever tested for HIV	
	%	N	%	N
Age				
15-19	70.8**	1879	42.0**	1675
20-24	92.6	2747	69.5	2005
Religion				
Catholic	81.8*	836	54.8	808
Protestant	84.2	3790	57.6	2812
Place of residence				
Rural	85.6**	2186	63.6**	1734
Urban	82.1	2440	51.1	1946
Wealth Index				
Poor	83.1	1746	51.3**	1202
Middle	83.4	1029	50.6	856
Rich	84.5	1851	64.5	1622
Work status				
Not-working	81.6**	2883	54.6**	1521
Working	87.5	1743	58.7	2159
Educational level				
Primary	80.7**	2008	41.5**	1305
Secondary or higher	86.0	2618	65.5	2375
Exposure to media				
Less than once a week	83.9	3073	54.8**	2060
At least once a week	83.5	1553	59.7	1620
Perceived risk of getting HIV				
Low or no risk	82.5**	2643	57.5	2377
Medium risk	85.8	1199	54.6	687
High risk	87.5	784	58.4	616

Used condom consistently with all partners	No	84.7**	4090	53.7**	2766
	Yes	76.1	536	67.0	914
Number of partners had sex	One	80.0**	2437	51.2**	950
	Two	87.0	1350	53.4	783
	Three or more	89.1	839	61.1	1947
Would buy vegetables from vendor with HIV	No	79.0**	1121	45.1**	746
	Yes	85.9	3495	60.2	2934
Total		83.6	4626	57.0	3680

*** Significant at $P < 0.01$; ** Significant at $P < 0.05$

Females who had sex with three or more partners (89%) were more likely to report having tested for HIV as compared to those who had sex with only one partner (80.2%). Similarly, males who had sex with three or more partners (61.1%) were more likely to report having tested for HIV as compared to those who had sex with only one partner (51.2%). Furthermore, females who reported that they would buy vegetables from a person with HIV (85.9%) were more likely to report having tested for HIV in comparison to those who reported that they would not buy from a vender with HIV (79%). In like manner, males who reported that they would buy vegetables from a person with HIV (60.2%) were more likely to report having tested for HIV in comparison to those who reported that they would not buy vegetables from someone with HIV (45.1%).

Relationship between the uptake of HIV testing and socio-economic and demographic characteristics

The Logistic regression analysis data of social economic and demographic variables on the uptake of HIV testing is shown in Table 4. The analysis identified age, place of residence, wealth status, work status, educational level, exposure to media, consistency of condom use, number of sex partners and perception of buying vegetables from a vendor who has HIV/AIDS as having significant influence on the uptake of HIV testing among females. Female respondents aged 20-24 were 4.7 times more likely to report having tested for HIV as compared to those in the age group 15-19. Females from urban areas were less likely to report having tested for HIV as compared to those from rural areas. Respondents from rich and middle-class backgrounds were negatively associated with the likelihood of reporting having tested for HIV. Females who were working were 1.3 times more likely to have tested for HIV as compared to those who were not working. With regard to educational level, those who had secondary or higher education showed a strong likelihood of reporting having tested for HIV as compared to those who only had acquired primary education. Those with secondary or higher education were 1.5 times more likely to report having tested for HIV than those with primary education. Moreover, female youths who reported using condoms consistently with their partners were less likely to report having tested for HIV as compared to those who used condoms inconsistently.

Table 3. Logistic Regression Analysis data of socio-economic and demographic variables on participants who reported having ever tested for HIV

Variables	FEMALES			MALES			
	Exp (β)	95% CI	P- value	Exp (β)	95% CI	P- value	
Age							
	15-19						
	20-24	4.7576	3.95-5.72	0.000	2.6247	2.26-3.04	0.000
Religion							
	Catholic						
	Protestant	1.1492	0.93-1.42	0.1844	1.1712	0.98-1.38	0.0866
Place of residence							
	Rural						
	Urban	0.8104	0.65-1.01	0.0621	0.0481	0.67-0.97	0.0229
Wealth Index							
	Poor						
	Middle	0.9282	0.72-1.18	0.1486	0.8967	0.74-1.09	0.2189
	Rich	0.7902	0.60-1.03	0.0879	1.0639	0.85-1.32	0.5874
Work status							
	Not-working						
	Working	1.2736	1.05-1.54	0.0132	1.8662	0.91-1.24	0.0000
Educational level							
	Primary						
	Secondary or higher	1.4774	1.21-1.79	0.0001	2.0984	1.78-2.47	0.0000
Exposure to media							
	Less than once a week						
	At least once a week	0.8309	0.69-0.99	0.0485	0.9559	0.82-1.11	0.5034
Perceived risk of getting HIV							
	Low or no risk	1.0939	0.89-1.34	0.3510	0.8618	0.72-1.03	0.1029
	Medium risk	1.2125	0.94-1.56	0.1351	0.9043	0.74-1.09	0.2852
	High risk						
Used condom consistently with all partners							
	No						
	Yes	0.5630	0.44-0.71	0.0000	1.5216	1.28-1.80	0.0000
Number of partners had sex							
	One	1.4876	1.21-1.82	0.0001	1.0482	0.85-1.28	0.7519
	Two	1.5832	1.22-2.04	0.0005	1.3684	1.14-1.62	0.0024
	Three or more						
Would buy vegetables from vendor with HIV							
	No						
	Yes	1.3548	1.11-1.64	0.0019	1.2933	1.08-1.54	0.0079

Furthermore, the females who had sex with two or more partners showed a more likelihood of reporting having tested for HIV as compared to those who had sex with one partner. Those who had sex with three or more partners were 1.4 times more likely

to have tested for HIV while those who had two partners were 1.5 times more likely to have tested for HIV. Female respondents who were comfortable with buying vegetables from someone who had HIV were 1.4 times more likely to report having tested for HIV as compared to those who reported that they would not buy vegetables from a vendor with HIV.

The Logistic regression analysis data of social economic and demographic variables on male youths who reported having tested for HIV is also shown in Table 3. The logistic regression analysis identified age, place of residence, work status, educational level, consistency of condom use, number of sex partners and comfortable with buying vegetables from a vendor who has HIV/AIDS all had significant influence on male respondents having tested for HIV. Respondents aged 20-24 were 2.6 times more likely to have tested for HIV as compared to those in age group 15-19. Males from urban areas were less likely to report having tested for HIV as compared to those from rural areas. Protestants were 1.2 times more likely to have tested for HIV in comparison to those who were Catholic. Male youths who were working were 1.8 times more likely to have tested for HIV as compared to those who were not working.

With regard to educational level, having secondary education showed a strong likelihood of respondents reporting having tested for HIV. Those who had secondary or higher education were 2 times more likely to have tested HIV compared to those who had primary education. Moreover, respondents who reported using a condom consistently with all partners were 1.5 times more likely to report having tested for HIV as compared to youths who did not use a condom consistently. Furthermore, having sex with three or more partners showed an increased likelihood of testing for HIV as compared to those who had sex with one partner. Those with three or more partners were 1.3 times more likely to have tested for HIV compared to those who had sex with one partner. Respondents who were comfortable with buying vegetables from someone who had HIV were 1.3 times more likely to report having tested for HIV as compared to those who reported that they would not buy vegetables from a vendor with HIV.

Discussion and Conclusion

The HIV prevalence rate in Zambia at 12.9% in 2015 (Zambia National AIDS Council) is still very high compared to prevalence rates in other African countries such as Sierra Leone at 1.5% in 2008 (Brima et. al). It should however be noted that Zambia has made significant strides in the reduction of the prevalence rates which were as high as 28% in the 1990s. That notwithstanding more effort is required to reduce the prevalence rate even lower in order to afford the people better standards of health and improved conditions of living.

This analysis which was aimed at exploring the factors which are associated with the uptake of HIV testing among sexually active young people in Zambia was with a view of understanding such factors so that targeted interventions could be formulated and undertaken. This survey found that age, place of residence, work status, educational level, consistency of condom use and the number of sexual partners were significantly related to the uptake of HIV testing for both female and male participants. In addition to the above listed factors, wealth status and exposure to media were found to be salient in explaining the uptake of HIV testing for female participants only.

The older participants in this study were found to be more likely to be tested for HIV than the younger participants. This is in agreement with other findings namely in Sierra Leone (Brima et. al 2015), Tanzania (Mahande et. al 2015) Italy (Renzi et. al, 2001) and to some extent in Zimbabwe (Takarinda et. al 2014). The reason for the significance of age could be because older youths are probably more informed than younger youths on HIV issues and even youths' perceived invulnerability can be an impediment to a higher uptake of HIV testing (Tenkorang et. al 2013).

This survey found that participants from urban areas for both females and males were less likely to be tested for HIV than participants from rural areas. This is in contrast with some studies (eg Brima et. al, 2015, Ali et. al, 2014) which found a higher rate of HIV testing in urban areas than in rural areas. In Zambia there is a high concentration of Non-Governmental Organisations (NGOs), Community Based Organisations (CBOs) in the rural areas in the fight against HIV and this could perhaps account for more participants in the rural areas having a higher uptake of HIV testing than urban participants. This result is also supported in part in neighbouring Zimbabwe where rural men had a higher HIV testing uptake (Takarinda et. al 2014) than men in urban areas.

Work status and educational levels were in this survey significantly related to HIV uptake with those in employment and those with higher education reporting higher levels of being tested for HIV. This supports earlier findings in Zambia where HIV testing was found to be positively related to education attainment (Fylkesnes 1999, Fylkesnes et. al, 2004) and other studies. Education enlightens an individual in many aspects of their lives including in HIV related matters and this enlightenment would most likely have a positive impact on HIV uptake as well. Work status is normally positively related to educational attainment as ordinarily the highly educated individuals also are likely to be in employment so being in employment affords an individual higher chance of exposure to information on the consequences of HIV and therefore such individuals are more likely to have a positive self-introspection and therefore undergo HIV testing.

Consistency in condom use yielded contradictory results in this survey for females and males. Females who reported consistent condom use were less likely to go for HIV testing whereas males who reported consistent use were more likely to go for HIV testing. This is a puzzling outcome which needs more investigation to delve into the psyche of men and women in trying to understand why the same behaviour should lead to different outcomes. In terms of the number of sexual partners the more sexual partners one had the higher the chances of uptake of HIV testing for both females and males. These results are in agreement with other studies (Renzi et. al, Takarinda et. al) which have reported increased uptake of HIV testing with increased sexual partners. The increase of sexual partners leading to a higher uptake of HIV testing is perhaps expected because an individual who has been exposed to information about HIV should be aware that the more sexual partners one has the higher the chances of HIV infection.

It is interesting to note that wealth status was significant in accounting for females' uptake of HIV testing but not significant for men and puzzling that exposure to media was also only significant for female uptake and not for male uptake of HIV testing. Exposure to media is not a frequently investigated variable although earlier analysis in the Zambian Sample (Kusanthan et.al, 2017) showed that exposure to media

significantly increased the chances of condom use for both females and males among never married youths in Zambia. More investigation is therefore required on exposure to media and uptake of HIV testing.

This survey has shown that the factors of age, place of residency, wealth and work statuses, educational level, exposure to media, consistency in condom use and number of sexual partners are important factors in explaining the uptake of HIV testing among sexually active young people in Zambia. It is important therefore for the government and other partners involved in the fight against HIV to increase their efforts in order to reach young people both in rural and urban areas and sensitize them to utilize the existing facilities which are at their disposal for HIV testing. The sexually active young people should be availed educational opportunities which in turn will hopefully expose them to viable economic opportunities. The media should 'preach' consistent use of the condom to the young men and women as well as a reduction in their sexual partners. More effort is definitely required in tackling the HIV pandemic in Zambia so that more young people and the general population can access HIV testing and by so doing improve their chances of leading a healthy fulfilling life.

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