

Factors Associated with Knowledge of Transmission and Prevention of HIV/AIDS among Men and Women in Uganda: Evidence from Demographic Health Survey of Uganda 2016

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Back ground

HIV/AIDS has become a major public health concern globally with majority of those affected found in Sub-Saharan Africa. Knowledge regarding transmission and prevention of HIV/AIDS in Uganda is still low making most persons not to disclose their HIV status due to fear of public judgement and isolation and this makes prevention and treatment very difficult.

Aim: This study aims to examine factors associated with knowledge of HIV/AIDS transmission and prevention among men and women in Uganda.

Method: We analysed data from a nationally-representative population-based cross-sectional survey, the 2016 Uganda demographic and health survey (UDHS), which included all the consenting women aged 15-49 years who were present in sampled households the night before the survey with a sample size of 18,506 women and 5,336 men.

Results: Around 99% of respondents had heard about HIV/AIDS but only a proportion of 58% and 54 % of women and men had high knowledge regarding transmission and prevention of HIV/AIDS. After adjusting for socio-demographic factors, women and men in the age group 25-29 years were more likely to have high knowledge regarding transmission and prevention of HIV/AIDS as compared to women and men respectively in 15-19 years (COR: 1.849; 95% CI: 1.681-2.033, AOR: 1.489; 95% CI: 1.323-1.676, (COR: 1.417; 95% CI: 1.180-1.702).

Conclusion: Continuous supply of antiretroviral therapy (ART) and male circumcision as best ways of reducing HIV transmission, further more health promotion with community involvement can yield a success story.

Keywords: HIV/AIDS; Uganda; Condom use; health education; male circumcision.

Introduction

According to global HIV statistics 2017, 36.9 million people were living with HIV globally including 1.8 million children. Around 25% of these same people do not know that they have the virus [1]. Since the start of the epidemic, an estimated 77.3 million people have become infected with HIV and 35.4 million people have died of AIDS-related illnesses and approximately 25.7 million people were living with HIV in sub-Saharan Africa by 2017 which is almost 66% [1]. According to Uganda AIDS indicator survey of 2016, around 1.2 million people are living with HIV in Uganda with a prevalence of 6% of which women are having highest prevalence 7.5% compared to men 4.3%. Prevention of HIV-1 infection with Early Antiretroviral Therapy (ART), HIV pre and post exposure prophylaxis (PrEP) (PEP), condom use has been a successful story in sub-saharan Africa and throughout the continent. Antiretroviral therapy that reduces viral replication could limit the transmission of human immunodeficiency virus type 1 (HIV-1) in serodiscordant couples [2-7]. Many studies has shown that sexuality education is key in prevention of HIV and related sexually transmitted diseases especially if given to adolescents, schools and many people those that receive sex education are likely not to indulge in risky sexual behaviours [8, 9]. HIV testing and counselling is so important because it helps to identify those having HIV making it easier for treatment especially home based HIV counselling and testing and also prevent mother-to-child transmission (MTCT) this should also be coupled with counselling about family planning methods other than condom use alone [10-13] and which lowers transmission to others however some studies found that people are scared to find out their status, shy, fear what people might say about them in case they are positive and above all fear of death [14]. There is much evidence that a higher level of education is correlated with having more knowledge about HIV risk when compared with populations of lower education and in such categories transmission of HIV is lower in highly educated as compared to the counterparts [15]. In addition to those peer-education-based interventions, social gatherings, trainings appear to be particularly effective in facilitating the uptake of HIV-related knowledge, particularly pertaining to transmission routes [16-17]. However, some studies have found that despite the knowledge levels about HIV seem high, misconception about routes of transmission, HIV/AIDS cure and condom use is still very common [18-19]. Some other studies conducted in Uganda suggested continuous supply of ART and male circumcision as best ways for HIV prevention coupled with community involvement [20-23]. However studies have shown that male circumcision is only effective when the male partner is sero negative so even

when the male partner is circumcised when is already positive, this does not reduce transmission of HIV [24]. Another study done in Kenya suggested that exclusive breastfeeding (EBF) (breast milk feeding without additional food or drink, except medicine is likely to reduce the risk of postnatal transmission of HIV from mother to child [25]. It is also much important to create HIV awareness and safe sexual behaviours among female sex workers as one way to prevent the transmission of HIV and this would increase their knowledge about HIV like consistent use of condoms with regular clients and non paying partners hence increasing safe sexual practices aimed at curbing transmission of HIV/AIDS [26]. Other studies have revealed that partnership dissolution in HIV status aware serodiscordant couples reduce the spread of HIV and this is majorly achieved through couple HIV testing and counselling [27, 28]. However, interactions among poverty, low knowledge gender, and health systems affect women's participation in services to prevent HIV transmission from mother to child (PMTCT) also challenges faced by outreach workers for PMTCT in addition stigma, financial costs of travelling to ART centres, non-affordability of infant formula, disclosure, ART use, service design and quality, spouse/partner influence, lack of awareness of the baby's needs, decision-making autonomy in turn affects women's participation in PMTCT services [29-30]. Also some studies have suggested that specific interventions are needed to improve the utilisation of HIV testing amongst heterosexual drug users, particularly amongst non-injection drug users since they are at very high risk of HIV transmission [31]. A study carried out in Congo about male students' perspectives on condom use and concurrent sexual partnerships revealed low knowledge about prevention of sexually transmitted infection since majority of students said that they prefer flesh to flesh sex than using condom and this seems prevalent among school students [32].

Method

We analysed data from a nationally-representative population-based cross-sectional survey, the 2016 Uganda demographic and health survey (UDHS), which included all the consenting women aged 15-49 years who were present in sampled households the night before the survey. The detailed methods are described elsewhere in UBOS & ICF international 2016.

Sampling

The sampling frame used for the 2016 UDHS is the frame of the Uganda National Population and Housing Census

(NPHC), conducted in 2014; the sampling frame was provided by the Uganda Bureau of Statistics. The census frame is a complete list of all census enumeration areas (EAs) created for the 2014 NPHC. The 2016 UDHS sample was stratified and selected in two stages (NPHC). In the first stage, 697 EAs were selected from the 2014 Uganda NPHC: 162 EAs in urban areas and 535 in rural areas. One cluster from Acholi sub region was eliminated because of land disputes. Households constituted the second stage of sampling.

Variables and measurement

Independent variables

Age (15-19, 20-24, 25-29, 30-34, 35-39, 40-44, 45-49),

Education (no education, primary, secondary, higher)

Residence (rural, urban)

Ethnicity (baganda, banyankore, bakiga, basoga, iteso, lango, others)

Wealth index (poorest, poorer, middle, richer, richest)

Religion (Anglican, catholic, Muslim, seventh day Adventist, Pentecostal/born again, others)

Occupation (not working, skilled work, agric/house hold domestic work, unskilled work)

Media exposure (never, frequently, sometimes)

Marital status (never in union, married, living with partner, widowed, divorced, separated) according to DHS 2016.

Dependent variable

Knowledge of HIV/AIDS

Measurement of knowledge

Study measured knowledge regarding transmission and prevention of HIV/AIDS using questions 1-15 below which were positively and negatively framed. 1) Ever heard of AIDS 2) Reduce risk of getting HIV: always use condoms during sex 2) Reduce risk of getting HIV: have 1 sex partner only, who has no other partners 3) Can get HIV from mosquito bites 4) Can get HIV by sharing food with person who has AIDS 5) A healthy looking person can have HIV 6) Condom used during last sex with most recent partner 7) Condom used during last sex with 2nd to most recent partner 8) Condom used during last sex with

3rd to most recent partner 9) Can HIV be transmitted during pregnancy 10) Can HIV be transmitted during pregnancy 11) Can HIV be transmitted during delivery 12) Can HIV be transmitted by breastfeeding 13) Would be ashamed if someone in the family had HIV 14) Can get HIV by witchcraft or supernatural means 15) Drugs to avoid HIV transmission to baby during pregnancy

With these questions we created a composite index of knowledge and this was categorized as high and low knowledge in a dichotomous variable. We adopted the scoring procedure from previous published study of shone [33]. That is, a score of 1 was assigned for correct and 0 for incorrect answers (including refused or don't know) and means were categorized as low knowledge ≤ 7.66 and high knowledge as >7.66 for men while for women means were categorized as low knowledge ≤ 8.4 and high knowledge as >8.4 this was translated as low knowledge for scores $\leq 50\%$ and high knowledge for scores $\geq 51\%$.

Statistical analysis

Descriptive and bivariate analysis were conducted to determine association between socio-demographic variables and knowledge of transmission and prevention of HIV/AIDS, we employed survey -weighted logistic regression. For bivariate analysis, we used a Pearson chi-square test to assess significance. Multi-variate adjusted model included with all variables. Any p-value <0.05 was considered significant. All statistical analyses were performed using SPSS version 20.

Results

Descriptive statistics

Table 1 shows the background characteristics of the respondents of a total of 18,506 women and 5,336 men Majority of respondents were in the age group 15-19 years with 23.0% followed by 20-24 years with 20.7% and the least was 45-49 years with 6.5%. 39.2% of the respondents were Catholics, 31% were Anglicans and Muslims were 12.9%, 13.3 were born again, 1.6 seventh day Adventists and rest were 1.3%. Majority of the respondents completed only primary 57.4% followed by secondary 25.1% and those who completed higher education were 7.9% and those completely with no education 9.6%. Majority of the respondents were Baganda 16.8% followed by Banyankore and Bakiga while lango only 5.7% participated and others 44.8%. 73.3 % were residing in rural and only 26.7% in urban. Around 45% of the respondents were involved in agriculture / house hold domestic work while 22.8 % were not involved in any form of work

Table 1. Background characteristics of the respondents

| Variable | % | N | % | N |
|-------------------------------------|----------|----------|----------|----------|
| Age | | | | |
| 15-19 | 23.0 | 4276 | 24.1 | 1270 |
| 20-24 | 20.7 | 3782 | 17.8 | 944 |
| 25-29 | 16.5 | 3014 | 13.9 | 740 |
| 30-34 | 13.7 | 4276 | 13.8 | 737 |
| 35-39 | 10.9 | 3784 | 9.2 | 497 |
| 40-44 | 8.7 | 3014 | 9.6 | 492 |
| 45-49 | 6.5 | 2600 | 6.0 | 363 |
| Religion | | | | |
| Anglican | 31.2 | 5799 | 33.7 | 1831 |
| Catholic | 39.6 | 7552 | 40.4 | 2201 |
| Muslim | 12.9 | 2166 | 13.5 | 644 |
| Seventh Day Adventist | 1.6 | 292 | 1.4 | 68 |
| Pentecost/ Born again | 13.3 | 2436 | 9.4 | 497 |
| Others | 1.3 | 2697 | 1.6 | 95 |
| Education | | | | |
| No Education | 9.6 | 2071 | 4.2 | 231 |
| Primary | 57.4 | 10893 | 55.3 | 3047 |
| Secondary | 25.1 | 4213 | 28.0 | 1449 |
| More than a secondary | 7.9 | 1329 | 12.5 | 609 |
| Ethnicity | | | | |
| Baganda | 16.8 | 2436 | 17.9 | 729 |
| Banyankore | 10.8 | 1687 | 10.9 | 479 |
| Bakiga | 6.8 | 1419 | 6.9 | 398 |
| Basoga | 7.6 | 1161 | 7.5 | 356 |
| Iteso | 7.5 | 1637 | 7.6 | 468 |
| Lango | 5.7 | 1298 | 6.5 | 431 |
| Others | 44.8 | 8868 | 42.7 | 2475 |
| Residence | | | | |
| Urban | 26.7 | 4379 | 24.9 | 1150 |
| Rural | 73.3 | 14127 | 75.1 | 4186 |
| Occupation | | | | |
| Not Working | 22.8 | 4077 | 5.8 | 298 |
| Skilled work | 17.2 | 2968 | 15.8 | 704 |
| Agriculture/ hse hold domestic work | 45.4 | 8489 | 48.0 | 2416 |
| Unskilled work | 14.5 | 2936 | 30.4 | 1375 |
| Wealth Index | | | | |
| Poorest | 17.5 | 3884 | 16.9 | 1057 |
| Poorer | 18.4 | 3640 | 17.7 | 1047 |
| Middle | 18.7 | 3485 | 19.6 | 1049 |
| Richer | 19.9 | 3454 | 22.0 | 1083 |
| Richest | 25.5 | 4043 | 23.7 | 1100 |
| Marital Status | | | | |
| Never in union | 25.8 | 4738 | 39.0 | 2029 |
| Married | 30.3 | 5813 | 36.1 | 2052 |
| Living with partner | 30.3 | 5566 | 19.3 | 960 |
| Widowed | 2.8 | 523 | .4 | 22 |
| Divorced | 0.8 | 139 | 0.6 | 34 |
| Separated | 9.9 | 1727 | 4.6 | 239 |

while 17.2 % skilled work and 14.5 % are involved in unskilled work. Approximately 25 % of the respondents were richest while 17.5 % were poorest rest of the respondents lie in the middle of these two categories. Around 30.3% of respondents were either married or living with partner while 25.8% were never in union and 2.8% and 0.8% were widowed and divorced respectively and 9.9 separated.

Table 2 shows distribution of HIV/AIDS knowledge among women in relation to socio-demographic factors. There was a strong association between age and knowledge regarding transmission and prevention of HIV/AIDS with $p=0.00$. It was shown that in the age group of 25-29 years 63.3% have high knowledge while 15-19 years 48.3% have low knowledge also those between 45-49 years 58 % had low knowledge. Religion was associated with knowledge regarding transmission and prevention of HIV/AIDS with $p=0.01$. Around 61.1 % of Muslims were found to have high knowledge while seventh day Adventists had the lowest knowledge. There was association between education and knowledge regarding transmission and prevention of HIV/AIDS with $p=0.01$. It was seen that 60.0% of respondents with secondary education had high knowledge as compared to primary and higher education while 44.8 % of respondents with no education had low knowledge. There was a strong association between residence, wealth index, marital status, occupation, ethnicity, and media exposure with $p<0.05$ and knowledge regarding transmission and prevention of HIV/AIDS.

Table 3 shows distribution of HIV/AIDS knowledge among men in relation to socio-demographic factors. Around 60.1% of men had high knowledge in age group 25-29 years and was strongly associated with knowledge regarding transmission and prevention of HIV/AIDS. There was no any association between religion, education, residence and knowledge regarding transmission and prevention of HIV/AIDS ($P=0.55, 0.31, 0.91$) respectively. Association was also seen in wealth index, marital status, occupation, ethnicity and media exposure.

Table 4 shows Unadjusted and adjusted odds ratios for factors associated with knowledge regarding transmission and prevention of HIV/AIDS among women with socio-demographic factors. Age was statistically significant and women in the age group 25-29 years were more likely to have more knowledge regarding transmission and prevention of HIV/AIDS as compared to women in 15-19 years (OR: 1.85; 95% CI: 1.68-2.03, aOR: 1.49; 95% CI: 1.32-1.68). Being Pentecost/born again were less likely to have knowledge regarding transmission and prevention of HIV/AIDS as compared to Anglican aOR: 0.90:

95% CI: 0.82-0.99. Ethnicity was statistically significant and Banyankore were 0.69 times less likely to have knowledge regarding transmission and prevention of HIV/AIDS (aOR: 0.69; 95% CI: 0.62-0.79) while Iteso was 0.46 times less likely to have knowledge regarding transmission and prevention of HIV/AIDS (OR: 0.46; 95% CI: 0.40-0.52). According to education those having primary were 1.12 times more likely to have knowledge compared to those with no education (aOR: 1.12; 95% CI: 1.06-1.32). According to wealth index, those who are in middle, richer and richest were 1.23, 1.37 and 1.38 times more likely than poorest to have more knowledge regarding transmission and prevention of HIV/AIDS. Those who are widowed are more likely to have high knowledge regarding transmission and prevention of HIV/AIDS (OR: 1.79; 95% CI: 1.48-2.16) after adjusting (aOR: 1.59; 95% CI: 1.29-1.96). According to occupation, those with skilled work and agriculture were 1.37 and 1.20 respectively more likely to have knowledge regarding transmission and prevention of HIV/AIDS. (OR: 1.37; 95% CI: 1.25-1.51), (OR: 1.20 95% CI: 1.12-1.29) respectively. Media exposure was statistically significant with those frequently exposed to media were more likely to have more knowledge compared to those never exposed to media (OR: 0.82; 95% CI: 0.76-0.88).

Table 5 shows unadjusted and adjusted odds ratios for factors associated with knowledge regarding transmission and prevention of HIV/AIDS among men Age group 25-29 years was statistically significant and they were likely to have more knowledge as compared to the reference category (COR: 1.42; 95% CI: 1.18-1.70) while those in age group 45-49 years were less likely to have knowledge (aOR: 0.69; 95% CI: 0.50-0.97). According to wealth index, those who are in the middle and richest were more likely to have knowledge regarding transmission and prevention of HIV/AIDS (COR: 1.32; 95% CI: 1.09-1.57) and (COR: 1.21; 95% CI: 1.02-1.43) respectively. According to occupation, those with unskilled work were more likely to have knowledge (COR: 1.59; 95% CI: 1.24-2.06).

Table 2 percentage distribution of knowledge by background characteristics among women

| Variables | Low | High | Total | P-Value |
|-------------------------------------|------|------|-------|-------------|
| | % | % | N | |
| Age | | | | |
| 15-19 | 51.7 | 48.3 | 4276 | |
| 20-24 | 39.9 | 60.1 | 3782 | |
| 25-29 | 36.7 | 63.3 | 3014 | |
| 30-34 | 37.1 | 62.9 | 2600 | 0.00 |
| 35-39 | 39.4 | 60.6 | 2029 | |
| 40-44 | 39 | 61 | 1621 | |
| 45-49 | 41.7 | 58.3 | 1184 | |
| Religion | | | | |
| Anglican | 41 | 59 | 5799 | |
| Catholic | 42.4 | 57.6 | 7552 | |
| Muslim | 38.9 | 61.1 | 2166 | 0.01 |
| Seventh Day Adventist | 43.8 | 56.2 | 292 | |
| Pentecostal/ born again | 43.6 | 56.4 | 2436 | |
| Others | 41.3 | 58.7 | 261 | |
| Education | | | | |
| No Education | 44.8 | 55.2 | 2071 | |
| Primary | 41.8 | 58.2 | 10893 | |
| Secondary | 40 | 60.0 | 4213 | 0.01 |
| higher | 42.6 | 57.4 | 1329 | |
| Residence | | | | |
| Urban | 38.9 | 61.1 | 4379 | |
| Rural | 42.7 | 57.3 | 14127 | 0.00 |
| Wealth Index | | | | |
| Poorest | 49.1 | 50.9 | 3884 | |
| Poorer | 43.8 | 56.2 | 3640 | |
| Middle | 40.2 | 59.8 | 3485 | 0.00 |
| Richer | 38.7 | 61.3 | 3454 | |
| Richest | 38.5 | 61.5 | 4043 | |
| Marital Status | | | | |
| Never in union | 50.7 | 49.3 | 4738 | |
| Married | 42.3 | 57.7 | 5813 | |
| Living with partner | 36 | 64 | 5566 | |
| Widowed | 36.5 | 63.5 | 523 | 0.00 |
| Divorced | 42.8 | 57.2 | 139 | |
| No longer living together/separated | 35.1 | 64.9 | 1727 | |
| Occupation | | | | |
| Not working | 45.7 | 54.3 | 4077 | |
| Skilled Work | 38.0 | 62.0 | 2968 | |
| Agriculture/Hse Hold Domestic Work | 41.1 | 58.9 | 8489 | 0.00 |
| Unskilled Work | 41.4 | 58.6 | 2936 | |

| Variables | Low | High | Total | P-Value |
|-----------------------|-------------|-------------|--------------|-------------|
| | % | % | N | |
| Ethnicity | | | | |
| Baganda | 33.5 | 66.5 | 2436 | |
| Banyankore | 42.6 | 57.4 | 1687 | |
| Bakiga | 34.3 | 65.7 | 1419 | |
| Basoga | 36.3 | 63.7 | 1161 | 0.00 |
| Iteso | 52.5 | 47.5 | 1637 | |
| Lango | 48.1 | 51.9 | 1298 | |
| Others | 43.9 | 56.1 | 8868 | |
| Media Exposure | | | | |
| Never | 45.7 | 54.3 | 4188 | |
| Frequently | 39.9 | 60.1 | 794 | 0.00 |
| Some times | 40.7 | 59.3 | 13524 | |
| TOTAL | 41.7 | 58.3 | 18506 | |

Table 3 percentage distribution of knowledge by background characteristics among men

| Variables | Low | High | Total | P-Value |
|-------------------------|------|------|-------|-------------|
| | % | % | N | |
| Age | | | | |
| 15-19 | 48.5 | 51.5 | 1270 | |
| 20-24 | 41.8 | 58.2 | 944 | |
| 25-29 | 39.9 | 60.1 | 740 | |
| 30-34 | 41.1 | 58.9 | 737 | 0.00 |
| 35-39 | 49.2 | 50.8 | 497 | |
| 40-44 | 43.2 | 56.2 | 492 | |
| 45-49 | 52.9 | 47.1 | 363 | |
| 50-54 | 53.5 | 46.5 | 293 | |
| Religion | | | | |
| Anglican | 45.1 | 54.9 | 1831 | |
| Catholic | 44.0 | 56.0 | 2201 | |
| Muslim | 47.0 | 53.0 | 644 | |
| Seventh Day Adventist | 47.1 | 52.9 | 68 | 0.55 |
| Pentecostal/ born again | 48.0 | 52.0 | 497 | |
| Others | 43.5 | 56.5 | 95 | |
| Education | | | | |
| No Education | 46.4 | 53.6 | 231 | |
| Primary | 45.2 | 54.3 | 3047 | |
| Secondary | 43.7 | 56.3 | 1449 | 0.31 |
| higher | 48 | 52 | 609 | |
| Residence | | | | |
| Urban | 45.1 | 54.9 | 1150 | |
| Rural | 45.2 | 54.8 | 4186 | 0.91 |
| Wealth Index | | | | |
| Poorest | 49.2 | 50.8 | 1057 | |

| Variables | Low | High | Total | P-Value |
|-------------------------------------|------------|-------------|--------------|----------------|
| | % | % | N | |
| Poorer | 45.5 | 54.5 | 1047 | |
| Middle | 45.4 | 57.6 | 1049 | |
| Richer | 45.2 | 54.8 | 1083 | 0.05 |
| Richest | 44.5 | 55.5 | 1100 | |
| Marital Status | | | | |
| Never in union | 46.9 | 53.1 | 2029 | |
| Married | 48.3 | 51.7 | 2052 | |
| Living with partner | 37.6 | 62.4 | 960 | |
| Widowed | 30.2 | 69.8 | 22 | 0.00 |
| Divorced | 51.0 | 49.0 | 34 | |
| No longer living together/separated | 38.9 | 61.1 | 239 | |
| Occupation | | | | |
| Not working | 52.6 | 47.4 | 298 | |
| Skilled Work | 48.2 | 51.8 | 704 | |
| Agriculture/Household domestic Work | 46.7 | 53.3 | 2416 | 0.00 |
| Unskilled Work | 41.0 | 59.0 | 1375 | |
| Ethnicity | | | | |
| Baganda | 41.7 | 58.3 | 729 | |
| Banyankore | 39.5 | 60.5 | 479 | |
| Bakiga | 38.9 | 61.1 | 398 | 0.00 |
| Basoga | 43.2 | 56.8 | 356 | |
| Iteso | 61.0 | 39.0 | 468 | |
| Lango | 42.9 | 57.1 | 431 | |
| Others | 47.0 | 53.0 | 2475 | |
| Media Exposure | | | | |
| Never | 47.7 | 52.3 | 525 | |
| Frequently | 44.2 | 55.8 | 4294 | 0.01 |
| Some times | 51.4 | 48.6 | 517 | |
| Total | 56 | 54 | 5336 | |

Table 4. Unadjusted and adjusted odds ratios for factors associated with knowledge regarding transmission and prevention of HIV/AIDS among women.

| Variables | Crude (Un adjusted odds) (95% C.I) | Adjusted odds ratio (95% C.I) |
|-----------------------|--|-------------------------------|
| Age | | |
| 15-19 Ref | | |
| 20-24 | 1.62 (1.48-1.77)*** | 1.36 (1.23-1.51)*** |
| 25-29 | 1.85 (1.68-2.03)*** | 1.49 (1.32-1.68)*** |
| 30-34 | 1.82 (1.65-2.01)*** | 1.47 (1.29-1.67)*** |
| 35-39 | 1.65 (1.48-1.84)*** | 1.32 (1.15-1.51)*** |
| 40-44 | 1.67 (1.49-1.88)*** | 1.35 (1.17-1.56)*** |
| 45-49 | 1.51 (1.33-1.72)*** | 1.22 (1.04-1.43)** |
| Residence | | |
| Urban Ref | | |
| Rural | 0.85 (0.79-0.91) | 0.96 (0.88-1.04) |
| Religion | | |
| Anglican Ref | | |
| Catholic | 0.94 (0.88-1.01) | 0.97 (0.91-1.05) |
| Muslim | 1.09 (0.99-1.20) | 0.97 (0.87-1.07) |
| Seventh Day Adventist | 0.89 (0.70-1.12) | 0.82 (0.64-1.04) |
| Pentecost/ born again | 0.89 (0.81-0.98)* | 0.90 (0.81-0.99)* |
| Others | 0.98 (0.75-1.28) | 1.02 (0.78-1.34) |
| Ethnicity | | |
| Baganda Ref | | |
| Banyankore | 0.67 (0.60-0.76)*** | 0.69 (0.61-0.78)*** |
| Bakiga | 0.96 (0.84-1.10) | 1.03 (0.89-1.19) |
| Basoga | 0.88 (0.77-1.01) | 0.96 (0.84-1.10) |
| Iteso | 0.45 (0.40-0.51)*** | 0.55 (0.47-0.63)*** |
| Lango | 0.54 (0.47-0.63)*** | 0.66 (0.57-0.77)*** |
| Others | 0.64 (0.59-0.70)*** | 0.72 (0.65-0.79)*** |
| Education | | |
| No Education Ref | | |
| Primary | 0.92 (0.79-1.06) | 1.18 (1.06-1.32)* |
| Secondary | 1.04 (0.93-1.16) | 1.13 (0.99-1.29) |
| higher | 1.11 (0.99-1.26) | 0.89 (0.75-1.05) |
| Wealth Index | | |
| Poorest Ref | | |
| Poorer | 1.24 (1.12-1.36)*** | 1.17 (1.06-1.29)* |
| Middle | 1.43 (1.30-1.58)*** | 1.29 (1.17-1.44)*** |
| Richer | 1.53 (1.39-1.68)*** | 1.37 (1.23-1.53)*** |
| Richest | 1.54 (1.41-1.69)*** | 1.38 (1.22-1.56)*** |
| Marital Status | | |
| Never in union Ref | | |
| Married | 1.40 (1.29-1.52)*** | 1.22 (1.09-1.36)*** |
| Living with partner | 1.83 (1.69-1.98)*** | 1.50 (1.36-1.66)*** |

| | | |
|------------------------------------|---------------------|---------------------|
| Widowed | 1.79 (1.49-2.16)*** | 1.59 (1.29-1.96)*** |
| Divorced | 1.38 (0.98-1.93) | 1.12 (0.78-1.59) |
| No longer living together | 1.90 (1.70-2.13)*** | 1.55 (1.36-1.76)*** |
| Occupation | | |
| Not working Ref | | |
| Skilled Work | 1.37 (1.25-1.51)*** | 1.08 (0.98-1.20) |
| Agriculture/Hse Hold Domestic Work | 1.20 (1.12-1.29)*** | 1.08 (0.99-1.17) |
| Unskilled Work | 1.19 (1.08-1.31)** | 1.05 (0.95-1.17) |
| Media Exposure | | |
| Never Ref | | |
| Frequently | 0.82 (0.76-0.88)*** | 1.05 (0.89-1.25) |
| Sometimes | 1.03 (0.89-1.18) | 1.07 (0.99-1.15) |

Note: Ref is the reference category, level of significance * p-value of <0.05, **p-value of <0.01, ***p-value of <0.001

Table 5. Unadjusted and adjusted odds ratios for factors associated with knowledge regarding transmission and prevention of HIV/AIDS among men.

| Variables | Crude(Unadjusted odds ratio) (95% C.I) | Adjusted odds ratio (95% C.I) |
|-----------------------|---|-------------------------------|
| Age | | |
| 15-19 Ref | | |
| 20-24 | 1.31 (1.11-1.55)* | 1.23 (1.00-1.49)* |
| 25-29 | 1.42 (1.18-1.70)*** | 1.22 (0.94-1.57) |
| 30-34 | 1.35 (1.12-1.62)** | 1.15 (0.87-1.51) |
| 35-39 | 0.97 (0.79-1.19) | 0.82 (0.61-1.11) |
| 40-44 | 1.24 (1.01-1.52)* | 1.09 (0.81-1.48) |
| 45-49 | 0.84 (0.66-1.07) | 0.69 (0.50-0.97)* |
| Ethnicity | | |
| Baganda Ref | | |
| Banyankore | 1.09 (0.89-1.35) | 1.15 (0.90-1.46) |
| Bakiga | 1.12 (0.88-1.44) | 1.13 (0.87-1.48) |
| Basoga | 0.94 (0.74-1.19) | 0.99 (0.76-1.27) |
| Iteso | 0.45 (0.36-0.58)*** | 0.49 (0.38-0.65)*** |
| Lango | 0.95 (0.74-1.22) | 1.06 (0.79-1.40) |
| Others | 0.81 (0.69-0.94) | 0.87 (0.72-1.04) |
| Wealth Index | | |
| Poorest Ref | | |
| Poorer | 1.16 (0.96-1.39) | 1.02 (0.83-1.24) |
| Middle | 1.32 (1.09-1.57)* | 1.15 (0.98-1.41) |
| Richer | 1.17 (0.98-1.39) | 0.99 (0.81-1.23) |
| Richest | 1.21 (1.02-1.43)* | 1.14 (0.89-1.46) |
| Marital Status | | |
| Never in union Ref | | |
| Married | 0.95 (0.83-1.07) | 1.09 (0.88-1.36) |

| | | |
|--------------------------------------|---------------------|-------------------|
| Living with partner | 1.46 (1.26-1.70)*** | 1.44 (1.15-1.79)* |
| Widowed | 2.04 (0.77-5.39) | 2.83 (1.02-7.84)* |
| Divorced | 0.85 (0.43-1.67) | 0.99 (0.48-2.07) |
| No longer living together/separated | 1.39 (1.06-1.82)** | 1.47 (1.05-2.06)* |
| Occupation | | |
| Not working Ref | | |
| Skilled Work | 1.19 (0.90-1.56) | 1.05 (0.77-1.42) |
| Agriculture/House Hold Domestic Work | 1.26 (0.99-1.62) | 1.19 (0.92-1.56) |
| Unskilled Work | 1.59 (1.24-2.06)*** | 1.34 (1.02-1.76)* |
| Media Exposure | | |
| Never Ref | | |
| Frequently | 1.15 (0.95-1.39) | 1.13 (0.83-1.54) |
| Sometimes | 0.86 (0.67-1.11) | 1.19 (0.87-1.66) |

Note: Ref is the reference category, level of significance * p-value of <0.05, **p-value of <0.01, ***p-value of <0.001

Discussion

Our study examined the factors associated with knowledge regarding transmission and prevention of HIV/AIDS in Uganda. The present study examined both men and women knowledge. The results show that there is improved HIV knowledge and similar study by Shona and kadengye [33] support this finding. The study from the national population based survey found out that over 99% of both women and men ever heard of AIDS but only 58% and 54% had high knowledge about transmission and prevention of HIV, this means health education need to be scaled up to achieve 90-90-90 of UNAIDS 2020 target. According to kadengye and shone [33] 40% of the women had high knowledge which means there is slight increase in the knowledge regarding transmission and discrimination. These results were consistent with peltzer [14].

Previous studies have showed that education play a big role in curbing HIV/AIDS and this is consistent with this study as we found education statistically associated with HIV knowledge [14, 34]. Many studies showed that Early Antiretroviral Therapy (ART) and condom use can prevent transmission of HIV/AIDS and this can lower the incidence of the infection hence controlling the spread of the disease [2-5]. Previous studies revealed that testing and counselling have shown a successful story since this helps in early case detection and early treatment which has played a major role in preventing mother to child transmission (MTCT) therefore this should continue to be scaled up as a public health strategy to prevent transmission of HIV/AIDS [10], [11]. However, some studies have found that despite the knowledge levels about HIV seem improving, misconception about routes of transmission, HIV/AIDS cure

and condom use is still very common in our study we found that 24% of respondents who still believe HIV can be transmitted by mosquito bites [18-19]. A limitation to our analysis is that we analysed knowledge of HIV/AIDS but were not able to assess actual HIV status.

Conclusion

Women and men who are residing in urban with higher education, richest and having skilled work were less likely to express stigma and discriminatory attitudes towards PLWHA and have high knowledge. Around 58% and 54% of women and men respectively had high knowledge about transmission and prevention of HIV/AIDS. Continuous supply of ART and male circumcision as best ways for HIV prevention coupled with community involvement. Scale up voluntary counselling and testing and increasing condom use as one way of preventing the transmission of HIV and health education need to be scaled up to achieve 90-90-90 of UNAIDS 2020 target. Sex education should be included in the school syllabus this will reduce misconceptions surrounding HIV/AIDS transmission and improve early interventions (primary intervention) such as abstinence. Government should not enact laws that criminalise gays, sex workers, injecting drug users because these are high risk groups that are highly responsible for increase of the infection. Criminalising them makes prevention efforts very difficult since they will not show up for treatment.

Notes

Compliance with ethical standards

Ethical considerations

This article is based on the secondary analysis of data which is available to all on demand for research purposes. Hence no compliance with ethical standards was required but we obtained permission from DHS division at ICF international from where data was downloaded.

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