



Mainstreaming of HIV and AIDS in Kenyan University Academic Programmes: Impact on Students' Sexual Behaviour

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Abstract: HIV and AIDS is a global public health problem with 36.7 million people living with the virus. HIV and AIDS education is taught in Kenyan universities as an undergraduate course with the aim of reducing levels of new transmission but few studies have been conducted to determine its impact. Using questionnaires, the study was carried out to determine the differences between students who had been taken through HIV and AIDS course (experimental) and those who had not undertaken the course (control) among first year students of South Eastern Kenya University, Kitui. The Pearson Chi-Square and Fisher's Exact tests were used to analyze data. 682 students took part in the study. 291 were experimental and 391 were control while 380 were males and 302 were females. A significantly higher proportion of experimental students correctly responded to the following knowledge and awareness indicator issues: HIV spread through semen, vaginal fluid and blood ($P=0.001$), there is a female condom that helps to decrease the chances of a woman getting HIV ($P=0.03$), a person will not contract HIV if he/she is taking antibiotics ($P=0.01$), taking a test for HIV one week after having sex will inform whether one has HIV or not ($P=0.000$) and a person can contract HIV by having oral sex ($P=0.001$). The following attitude, perception and practices indicators were significantly different between the two groups of students: I feel shy talking about condoms with my boy or girlfriend ($P=0.02$), it is a good idea for students to delay having sex until they are older or until marriage ($P=0.01$). Some of the differences were due to belonging to a particular gender. 7.9% and 11.8% of experimental and control students respectively had not taken an HIV test in the last one year. 86.2% and 81.8% of control and experimental student respectively appreciated teaching of HIV and AIDS in Kenyan Universities. Differences observed between control and experimental were influenced by beliefs in some myths and lack of or imbalanced HIV and AIDS education regarding transmission, management and prevention. The differences seemed to be contributed by a particular gender of the students. In order to realize the positive impact of these lessons, delivery of HIV and AIDS education content needs to be addressed. Additionally, the subject should be taught during the first semester of their first year of study. Majority of the students appreciated the importance of HIV and AIDS education in Kenyan Universities.

Keywords: HIV and AIDS Mainstreaming, HIV Prevention, Sexual Behaviour, University Students, Questionnaires

1. Introduction

HIV and AIDS pose a major global public health problem. Worldwide, there were 2.1 million new infections adding up to a total of 36.7 million people living with HIV in the year 2015 [1]. Kenya being located in the world's most affected region had 1.5 million people living with HIV in the same year [1]. Majority of new infections in Kenya occur among

the young people of 15-24 years, the age bracket of many undergraduate university students [2].

There are considerable HIV and AIDS impacts on universities with resultant loss of staff and students among others [2]. Strategies to address the situation should ideally include promotion of safe sexual behavior for adolescents and young adults who tend to be at a higher risk than the rest of the population [3]. Empowering the youth through

education plays a more expected role as an HIV and AIDS health preventive factor [4]. It remains the social vaccine in the absence of a cure for HIV/AIDS [5]. Results of HIV and AIDS education in the African region vary. In Uganda, the school-based AIDS education programme had little effect on students' sexual behaviour considering the score of the key questionnaire variables by experimental and control students [3]. However in Nigeria, the intervention students exhibited greater knowledge about HIV/AIDS transmission and prevention [6].

Besides provision of free primary and day secondary education [7], the Kenya government has tasked public institutions to mainstream HIV and AIDS in their core functions [8]. Consequently, HIV and AIDS is taught in Kenyan universities addressing the root causes and effects of HIV and AIDS, the impact of AIDS on productivity and labour costs, plight of people with special needs (such as people living with AIDS) and HIV and AIDS related human rights violations [8]. Despite their being elaborate guides for HIV and AIDS mainstreaming in the public sector in Kenya [8], few studies have been conducted to ascertain the impact of HIV and AIDS mainstreaming among the university students.

The current study was therefore carried out to assess the impact of HIV and AIDS education on the pandemic's awareness, Knowledge, attitudes, perceptions and practices among Kenyan university students.

2. Methods

The study involved students of South Eastern Kenya University, in Kitui county, Kenya. The university is one of the 22 public universities in Kenya. It admits most of its students from the same national pool and therefore has a country wide representation. A comprehensive questionnaire was administered in the beginning of the semester to two groups of first year students. The first group (experimental) had already studied the mandatory HIV and AIDS subject whereas the other (control) had not. Students were requested to fill the simple questionnaire as honestly as possible

without consultation during the allowed 20-30 minutes. No names or any other identification details were indicated on the questionnaires. The questionnaire focused on background cognitive status, causes, infection, spread, control and management of the pandemic. The choice of study programmes to which students belonged was done at random. All questionnaires were collected after the session and information therein entered into MS excel spread sheet. Sample size of 600 students was based on number of participants in similar studies within the region which varied between 259 [5] and 2000 [3] though the latter study was carried out in more than 10 learning institutions.

Data was imported into SPSS version 20 computer software for analysis. Pearson Chi-Square was used to analyze the differences between experimental and control students. Variables depicting HIV and AIDS knowledge, awareness, attitudes perceptions and practices detailed in the questionnaire were the main focus of the differences. Students' responses from experimental and control groups were also analyzed based on gender. In cases where expected cell frequencies were less than 5, Fisher's Exact Test was used instead of Pearson Chi-Square [8].

Ethical considerations

Prior to filling questionnaires, students willing to take part in the study signed consent forms. To ensure confidentiality of information provided by participants, any identification details on questionnaires was not allowed. Further, confidentiality agreement was signed between the students and investigators.

3. Results

A total of 682 first year students submitted filled questionnaires. Of the total, 291 were experimental and 391 were control while 380 were males and 302 were females. Table 1 below shows the differences between the experimental and control students in terms of HIV and AIDS knowledge and awareness. Table 2 shows the differences between experimental and control students in terms of attitudes, practices and perception.

Table 1. Differences between control and experimental groups of students' responses in terms of HIV and AIDS Knowledge and awareness.

HIV and AIDS knowledge and awareness variables	Experimental	Control	Statistics
There is cure for AIDS	True 14 (4.1%) False 269 (95.1%)	True 25 (6.5%) False 362 (93.5%)	$\chi^2 = 0.683$, df=1, P=.40
HIV spread through semen, vaginal fluid and blood (T) ^a	True 290 (99.7%) False 1 (0.3%)	True 373 (95.9%) False 16 (4.1%)	$\chi^2 = 9.704$, df= 1, P=.001
You can also contract HIV by shaking hands with an infected person (F)	True 1 (0.3%) False 287 (99.7%)	True 2 (0.5%) False 388 (99.5%)	$\chi^2 = 0.103$, df=1, P=.61
Condoms can protect one from HIV infection if used correctly and consistently (T)	True 251 (86.1%) False 38 (13.9%)	True 341 (89.5%) False 40 (10.5%)	$\chi^2 = 1.122$, df=1, P=.17
One condom can be used twice if carefully handled (F)	True 7 (2.5%) False 278 (97.5%)	True 16 (4.5%) False 368 (95.5%)	$\chi^2 = 1.442$, df=1, P=.16
Young people should avoid sex so as not to contract HIV or any other STD (T)	True 251 (87.2%) False 37 (12.8%)	True 327 (84.1%) False 62 (15.9%)	$\chi^2 = 1.266$, df=1, P=.15
The more the sexual partners one has, the more the chances of contracting HIV (T)	True 251 (91.3%) False 37 (8.7%)	True 342 (88.4%) False 45 (11.6%)	$\chi^2 = 1.580$, df=1, P=.12

HIV and AIDS knowledge and awareness variables	Experimental	Control	Statistics
Having one sexual partner eliminates the chances of contracting HIV (F) ^a	True 199 (69.3%) False 88 (30.7%)	True 209 (54.3%) False 176 (45.7%)	$\chi^2 = 15.619$, df=1, P=.00
You can always tell if a person has HIV by the way they look (F)	True 10 (3.5%) False 276 (96.5%)	True 17 (4.4%) False 366 (95.6%)	$\chi^2 = 0.375$, df=1, P=.34
Pulling out the penis before a man ejaculates keeps a woman from getting HIV during sex (F)	True 23 (8.2%) False 259 (91.8%)	True 41 (10.6%) False 344 (89.4%)	$\chi^2 = 1.167$, df=1, P=.17
A woman can get HIV by having anal sex with a man (T)	True 216 (79.9%) False 57 (20.1%)	True 272 (74.9%) False 91 (25.9%)	$\chi^2 = 1.532$, df=1, P=.12
Showering or washing one's genitals after sex keeps a person from getting HIV (F)	True 10 (3.5%) False 275 (96.5%)	True 23 (6%) False 361 (94%)	$\chi^2 = 2.147$, df=1, P=.09
A woman cannot get HIV if she has sex during her period (F)	True 12 (4.2%) False 272 (95.8%)	True 16 (4.2%) False 368 (95.8%)	$\chi^2 = 0.001$, df=1, P=.55
There is a female condom that helps to decrease the chances of a woman getting HIV (T) ^a	True 238 (84.4%) False 44 (15.6%)	True 294 (78.6%) False 80 (21.4%)	$\chi^2 = 3.513$, df=1, P=.03
A person will not get HIV if he/she is taking antibiotics (F) ^a	Yes 13 (2.1%) No 278 (93.5%)	Yes 7 (2%) No 384 (96.5%)	$\chi^2 = 21.377$, P=.01
Taking a test for HIV one week after having sex will tell whether one has HIV or not (F) ^a	Yes 21 (7.2%) No 270 (92.8%)	Yes 58 (14.8%) No 333 (85.2%)	$\chi^2 = 20.036$, df=4, P=.00
It is safe to have unprotected sex after a negative HIV test result for both partners (F)	Yes 87 (29.9%) No 128 (70.1%)	Yes 128 (32.7%) No 246 (67.3%)	$\chi^2 = 8.558$, df=4, P=.07
A person can contract HIV by having oral sex (T) ^a	Yes 186 (63.9%) No 105 (36.1%)	Yes 206 (52.7%) No 185 (47.3%)	$\chi^2 = 16.122$, df=4, P=0.001

A superscript "a" against a variable indicates statistical significance between experimental and control students. Correct responses are in parenthesis (T=True, F=False). Degrees of freedom are shown only in the cases where Pearson Chi-Square was used in data analysis.

Table 2. Differences between control and experimental group of students' responses in terms of HIV and AIDS attitudes, practices and perception.

Students' attitudes, practices and behavior variable	Experimental	Control	Statistics
Do you have a boyfriend/girlfriend? ^a	Yes 228 (78.4%) No 65 (21.6%)	Yes 327 (83.6%) No 64 (16.4%)	$\chi^2 = 15.416$, P=.01
It is okay to have sex without a condom sometimes because the chances of contracting HIV are not that high.	Agree 54 (9.6%) Disagree 237 (81.4%)	Agree 59 (8.4%) Disagree 332 (84.9%)	$\chi^2 = 8.258$, P=.10
I feel shy talking about condoms with my boy or girlfriend ^a	Agree 20 (6.9%) Disagree 230 (79%)	Agree 46 (11.8%) Disagree 303 (77.5%)	$\chi^2 = 10.936$, P=.02
I feel shy buying a condom.	Agree 73 (25.1%) Disagree 179 (61.5%)	Agree 122 (31.2%) Disagree 221 (56.5%)	$\chi^2 = 12.821$, P=.09
Would you use a condom when having sex if it is available?	Yes 235 (80.8%) No 25 (8.9%)	Yes 301 (77%) No 43 (11%)	$\chi^2 = 6.848$, P=.16
It is a good idea for students to delay having sex until they are older or until marriage ^a	Agree 197 (67.7%) Disagree 64 (22%)	Agree 303 (77.5%) Disagree 61 (15.6%)	$\chi^2 = 21.367$, P=.01
If my boy or girlfriend wanted me to have sex, it will be better to agree than to lose him or her	Agree 68 (23.3%) Disagree 293 (66.1%)	Agree 88 (22.5%) Disagree 270 (69.1%)	$\chi^2 = 12.568$, P=.09
It is alright to accept gifts/favours from people whose intentions are not clear	Agree 26 (8.9%) Disagree 235 (80.8%)	Agree 32 (8.2%) Disagree 326 (83.4%)	$\chi^2 = 6.999$, P=.18
If a girl says "no" to sex, she may in fact be saying "yes"	Agree 130 (44.7%) Disagree 122 (41.9%)	Agree 175 (44.8%) Disagree 181 (46.3%)	$\chi^2 = 18.980$, P=.07
Have you taken a test for HIV in the last one year?	Yes 186 (63.9%) No 76 (26.1%)	Yes 240 (61.4%) No 119 (30.4%)	$\chi^2 = 7.103$, P=.11

A superscript "a" against a variable indicates statistical significance between experimental and control students. Fishers exact test does not display degrees of freedom.

Fig. 1 shows responses of students whether they had had sex before. The differences between experimental and control students was significant ($\chi^2 = 15.048$, P=.003).

Less than 40% of students answered the question regarding the reasons for abstaining from sex. Faith in God (depicting an expected religious standard) was cited as the main reason (Experimental 22%, Control 28.6%) followed by fear of contracting sexually transmitted infections (Experimental 5.8%, Control 10.5%). The difference between the two

groups of students with regard to the reasons given was significant ($\chi^2 = 27.153$, P=.001).

Of the students who had had sex after joining university (difference between control and experimental not significant), 16.2% of the experimental group did not use condoms. The main reason given was that they trusted their partners (experimental 11.7%, control 8.4%) rather than unavailability (experimental 1%, control 3.6%). These results were however not subjected to data analysis due to low number of responses.

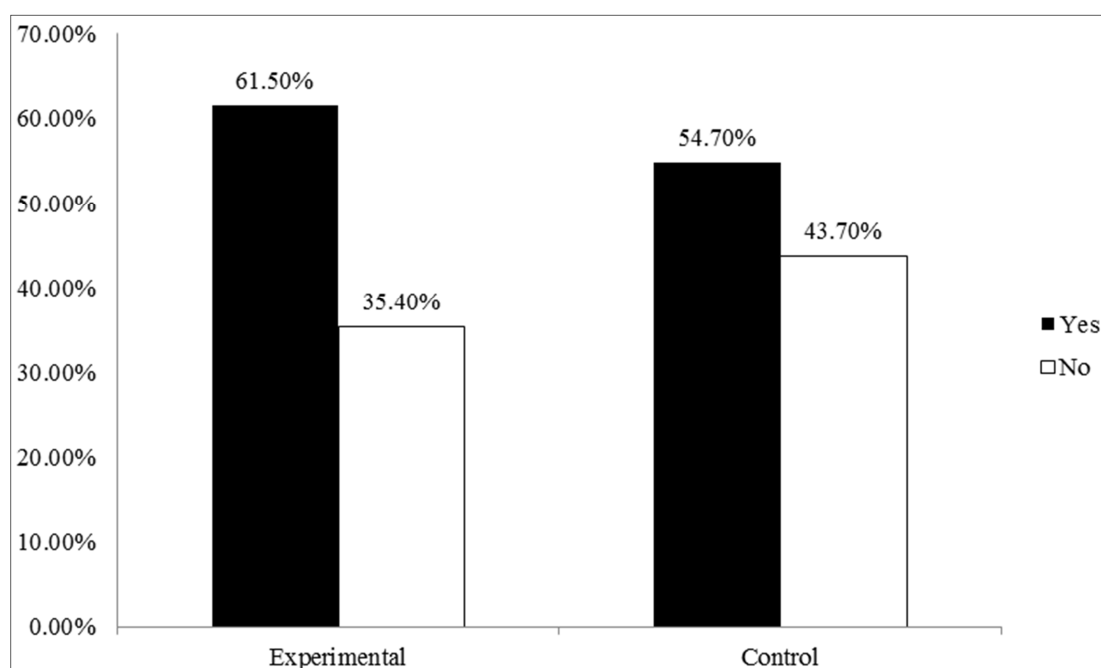


Fig. 1. Percentages of students who had and those who had not had sex.

7.9% and 11.8% of experimental and control students respectively had not taken an HIV test in the last one year because “there was no need” whereas 6.5% and 8.2% of experimental and control students respectively, feared an outcome of a positive test result. Again because of the low number of responses, less than 50%, these results were not

subjected to statistical test.

An opinion was sought on how students perceived HIV and AIDS studies in Kenyan universities. Fig. 2 below shows the students' opinion on HIV and AIDS education. There was no difference in responses between the control and experimental students ($\chi^2=18.183$, $P=.06$).

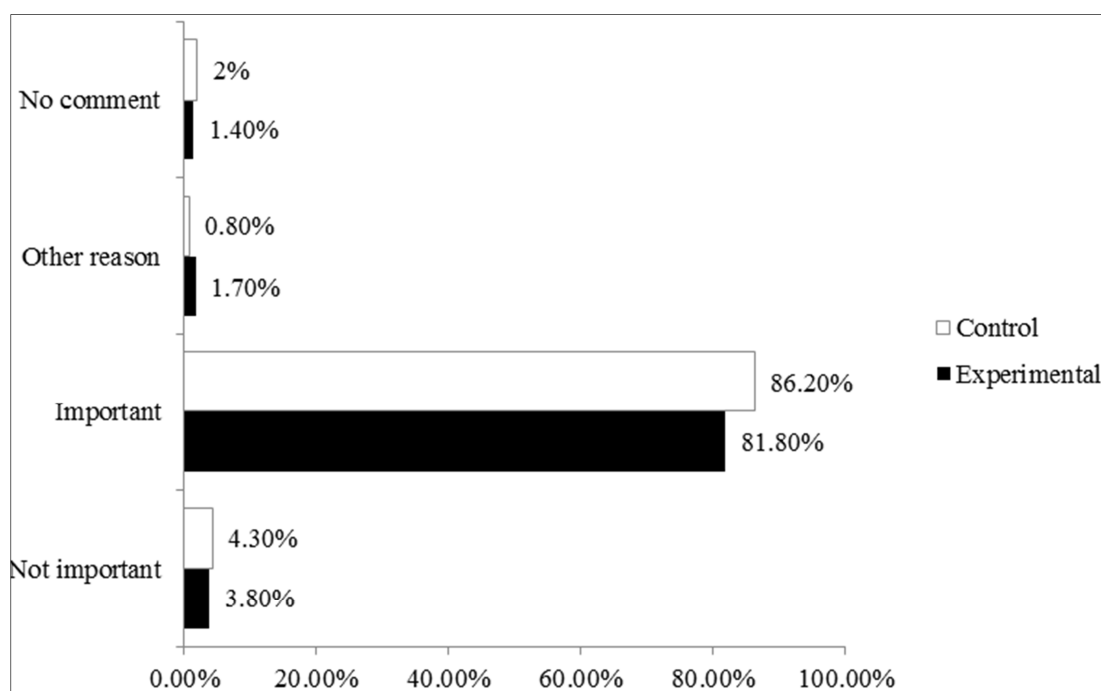


Fig. 2. Perception of HIV and AIDS formal education in Kenyan Universities.

There were gender based responses to the knowledge and awareness indicator questions. A significantly higher

proportion of experimental males ($\chi^2=6.802$, $df=1$, $P=.01$) knew that HIV is spread through semen, vaginal fluid and

blood. The case was different with females ($\chi^2=2.992$, $df=1$, $P=.08$). A higher proportion of experimental female students ($\chi^2=16.851$, $df=1$, $P=0.000$) believed that having one sexual partner eliminates the chances of contracting HIV. There was no difference among the males ($\chi^2=2.567$, $df=1$, $P=.07$). More experimental males than their control counterparts ($\chi^2=5.267$, $df=1$, $P=.01$) knew that a woman can get HIV by having anal sex with a man. These differences were not detected among females ($\chi^2=0.443$, $df=1$, $P=.30$). A higher proportion ($\chi^2=6.545$, $P=.03$) of experimental female students understood that taking an antibody test for HIV one week after having sex does not indicate whether one has HIV or not. There was no difference among the control and experimental male students ($\chi^2=3.726$, $P=.15$). Finally, more experimental female students ($\chi^2=13.074$, $P=.001$) knew that a person can contract HIV by having oral sex while there was no difference among the male students ($\chi^2=0.646$, $P=.72$).

In terms of HIV and AIDS associated attitudes, practices and perception, more experimental females had had sex before ($\chi^2=13.079$, $P=0.001$) where as there was no difference among males ($\chi^2=0.169$, $P=.94$). More of the experimental female students sex for the first time after joining university in comparison with the control students ($\chi^2=10.901$, $P=.01$). A greater proportion of control female student felt shy buying condoms ($\chi^2=8.395$, $P=.02$). Both groups of male students did not feel shy buying condoms ($\chi^2=3.281$, $P=.31$). A higher proportion of control male students felt it was okay to have sex without a condom sometimes because the chances of contracting HIV were not that high ($\chi^2=7.138$, $P=.02$). There was no difference among the female students ($\chi^2=1.120$, $P=.57$). More male control students feel shy talking about condoms with their girlfriends ($\chi^2=6.998$, $P=.02$). The difference was not evident among the female students ($\chi^2=1.961$, $P=.36$). The belief that if a girl says “no” to sex, she may in fact be saying “yes” was upheld by control male ($\chi^2=7.787$, $P=0.03$) and female ($\chi^2=11.432$, $P=.01$) students.

4. Discussion

The study findings indicate that there is a level of HIV and AIDS knowledge and awareness among both experimental and control students. However, of the knowledge and awareness variables investigated, significant differences in the two groups of students were noted in the responses to the following: HIV is spread through semen, vaginal fluid and blood, having one sexual partner eliminates the chances of contracting HIV, a person will contract HIV if he/she is taking antibiotics, taking a test for HIV one week after having sex will tell whether one has HIV or not, there is a female condom that helps to decrease the chances of a woman getting HIV and a person can contract HIV by having oral sex. The experimental group displayed significantly better knowledge and awareness basically because the issues in question had been covered by the students during the HIV and AIDS course. HIV and AIDS study therefore helps to demystify myths and misconceptions propagated regarding

several key control, management and prevention issues such use of antibiotics as HIV prophylaxis and that it is safe to have sex after partners get an HIV antibody negative result. Since female students are more vulnerable to HIV infections than their male counterparts [2], female condoms can be used effectively to avoid HIV infections [10]. This is true especially in cases where male partners are unwilling to use or unavailability of the male condom. Female condoms are however not popular due to ignorance of their availability among other factors. HIV and AIDS education therefore bridges this knowledge gap as shown by the results of the study. Students without formal HIV and AIDS education do not know oral sex as another route of infection hence may be practiced by some as a way of avoiding HIV infections.

There was difference between the proportions of experimental and control students with regard to whether they had had sex before or not. The fact that more of the control students had not had sex before was consistent with EAC/EALP study [11] and not related to HIV and AIDS education. Sexual abstinence is generally higher among the first year students but progressively decreases with the year of study [11]. The trend can be explained by the known fact that the university set up offers a vast environment and opportunity for higher risk behaviours such as multiple sexual partners, unprotected sex, sex for favours among others [2]. In this case, the control students were joining the university whereas the experimental group had joined more than six months before and therefore not subjected to “university forces” that erode sexual intercourse abstinence. Though the difference between experimental and control groups was not significant, of the students who had had sex before, up to 16% of experimental groups did not use condoms in their last sexual encounter. This was not expected of the group especially after taking classes in HIV and AIDS at the university. It however conformed to a previous study which showed that condom use among university students though high, was not consistent [11]. Trusting the partner ranked high among the reasons for not using the condoms. Similar results were also found by a previous study conducted among university students in Kenya [11]. The reasons given for abstaining from sexual intercourse were various among students and seemed not to be informed by HIV and AIDS education. Faith in God and religious teachings about God’s moral standards as the main reason for abstaining from sex seemed to be more of a function of upbringing and other external factors rather than education. Fear of contracting sexually transmitted infections was another deterrent to sexual activity though coming after faith. These findings were consistent with a previous study [11] which revealed the same reasons for abstaining from sex.

When students in experimental and control groups were compared by gender, it was found out that there were differences in their responses to questions regarding knowledge and awareness. The significant proportion of experimental male students knew that HIV spreads through semen, vaginal fluid and blood. It is uncertain why the differences occurred only in male gender especially when there

is wide knowledge in Kenyan community that contact with these fluids can result to an infection. On the other hand, significantly more female experimental students believed that having one sexual partner eliminates the chances of contracting HIV. The belief is however not premised on the fact that both partners need to be faithful to each other for assurance of lack of infection. Since the experimental students had gone through HIV and AIDS course, the response was not expected and could have been influenced by gender based factors rather than the course. A higher proportion of experimental males knew that a woman can get HIV by having anal sex with a man. Lack of this knowledge can be a risk factor since anal sex is known to be practiced by university students [2]. Control female students did not know that taking an antibody test for HIV one week after having sex will not tell whether one has HIV or not. Just because HIV antibody level is too low to be detected by the test, students who may have contracted HIV may engage in sexual intercourse after a negative result thus exposing the partner to infection.

HIV and AIDS attitudes and practices together with knowledge influences decision and choice making hence reducing the risk of infection, re-infection and transmission of HIV [2]. Responses indicative of attitudes, practices and perception from experimental and control students were significant in a number of questions: whether a students had a boyfriend/girlfriend, feeling shy talking about condoms with boy or girlfriend and whether it was a good idea for students to delay having sex until they were older or until marriage. Of all three, it's only in the latter two cases where the differences were associated with having received formal HIV and AIDS education. Significantly lower proportion of experimental students had girlfriends or boyfriends though the reason for this was not clear since entering into a relationship is a function of many factors which may include age and other socio-economics. When HIV and AIDS attitudes, practices and perception of control and experimental students' responses were analyzed by gender, a slightly different scenario emerged. More experimental female students had had sex probably owing to their more exposure to opportunities that eroded their ability to abstain from sex. This is associated with fact that experimental female students had had sex for the first time after joining university. Female control students felt shy buying condoms thus leaving the decision of condom acquisition to the male sexual partner in case of a sexual encounter. More control male students believed it was right to have sex without a condom sometimes because the chances of contracting HIV are not that high. Surprisingly, they felt shy talking about condoms with their girlfriends but could not feel shy buying them. It was not clear why the cases were not the same with their female counterparts. There were however differences between experimental and control groups in both male and female student when it came to the narrative that "if a girl says 'no' to sex, she may in fact be saying 'yes'". The myth is one among many

that a student who has successfully taken HIV and AIDS class would easily dispel.

There were other study findings that are worth noting. There was up to 36.1% of experimental students who answered incorrectly to issues regarding HIV and AIDS knowledge, awareness, attitudes, practices and perception. This raises the question as to whether HIV and AIDS course content delivery is appropriate. Kinsman and colleagues working on HIV and AIDS education programme among schools in Uganda agreed that "unless teachers are somehow obliged to cover the subject, the programme may fail due to incomplete implementation" [3]. Secondly, up to 26.1% of control students had not taken the HIV test in a year. This percentage is high especially for students who knew that HIV testing and counseling is critical point of entry for HIV prevention care and treatment [8]. It is however a reflection of the situation in Kenya where over 53% of people living with HIV are unaware of their HIV status [8]. Thirdly, over 80% of both control and experimental students appreciated the importance of HIV and AIDS course in Kenyan universities. Probably this is attributable to the importance attached to understanding the whole subject of HIV and AIDS by the general community to which the students belong. The response also implies that majority students would take the course with little coercion thus attaining the government's objective of HIV and AIDS mainstreaming university education.

5. Conclusions

Both control and experimental students had some HIV and AIDS knowledge, awareness, attitudes, perception and practices. The observed differences were probably influenced by belief in some myths and lack of HIV and AIDS education regarding transmission and prevention among other factors. The differences were to some extent gender-based. Students who had taken HIV and AIDS education were more likely to dispel myths associated with HIV and AIDS transmission, prevention and control. It is recommended that mastery and mode of content delivery need to be addressed in order to realize the positive impact of imparting practical life skills to students. This will further boost the appreciation of HIV and AIDS education in Kenyan Universities which is currently over 80%. It is also recommended that students are taught HIV and AIDS immediately they begin their undergraduate courses rather than later.

Study limitation included the limited time allowed to fill questionnaires which may have contributed to a number of forms not being returned by respondents.

Authors' Contributions

SK: Conception of study, administration of questionnaires, data analysis and manuscript writing.

DPK: Conception of study, study design and review of manuscript.

JK: Conception of study, study design and review of manuscript.

Competing Interests

There are no competing interests

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