



Behavioural Practices Associated with Occurrence of HIV among University Students in Ghana

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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ABSTRACT

Background: Achieving zero HIV infection would require the thorough understanding of the prevalence of HIV and high risk behaviours among most-at-risk groups such as student populations in order to determine what interventional measures would be most appropriate to use. This study was, therefore, undertaken to determine Kwame Nkrumah University of Science and Technology (KNUST) students' HIV sero-status in order to know their HIV prevalence in relation to their attitude, perception and knowledge of HIV/AIDS, their knowledge of sex and sexuality as well as their understanding of HIV-related stigmatization. This was to enable the development of specific effective and targeted HIV-prevention interventional programme aimed at preventing HIV infection among the KNUST student population.

Methods: This was a cross-sectional study carried out at the Kwame Nkrumah University of Science and Technology (KNUST). We structurally surveyed some of the students' knowledge and understanding of HIV/AIDS, sex and sexuality and HIV-related stigmatization and their HIV prevalent rate through a 48-item questionnaire administration and HIV antibody testing. HIV antibody status was determined by the serological testing for HIV antibodies in their blood using Abbott Determine HIV 1/2 kit for first line screening and OraQuick HIV 1 & 2 kit for the confirmatory testing.

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Results: Results obtained revealed that the students of KNUST surveyed had adequate knowledge about HIV transmission and its associated risk factors though they actively engaged in HIV transmission risky behaviours such as premarital sex and sex with multiple and/or casual partners. This notwithstanding, all the 754 students who participated in this study as well as the 4,085 student population who underwent HIV testing all tested negative.

Conclusion: The observation that the HIV prevalent rate among the students studied is zero could be that those students may be those, who as a result of their lifestyle, were confident that their HIV status would be negative. This observation, notwithstanding the HIV transmission risky behaviours that the students studied may be engaging in, may be due to the higher education these students may be getting.

Keywords: HIV; students; behaviors; sexuality; stigmatization.

1. INTRODUCTION

The determination of prevalent rates of HIV and AIDS infection within the general population continues to be very important because it enables the relevant authorities to obtain the necessary data to plan and formulate appropriate and relevant intervention policies that could lead to the prevention or slowing down the spread of the infection [1-3]. It also allows specific studies to be developed to know about the changing characteristics of the virus and its relationship or interactions with the host [4-6]. Ghana is counted among those countries that have been successful in achieving a substantial decline in the prevalence and incidence of HIV. It is also one of the countries which is actively using the multisectoral response to HIV/AIDS, which are the development of achievable policies, interventional strategies and programs that focuses on the ABC factors of Abstinence, Be faithful, and Condom use [7,8]. It is the utmost desire of the HIV policy makers in Ghana to achieve, if possible, zero HIV new infections. Achieving zero HIV infection would require the thorough understanding of the prevalence of HIV and high risk behaviours among most-at-risk population in order to determine what interventional measures would be most appropriate to use. As a group, students are generally considered vulnerable to HIV infection because they are predominantly in the sexually active age group and also frequently engage in risky sexual and anti-social behaviours [9-11]. This invariably exposes majority of them to all kinds of social and peer pressures making some of them develop relationship whose characteristics relate to HIV-related risk. This makes students an important target for primary HIV prevention interventions. However, most of the HIV prevalence and sexual behaviour data provided by the Ghana National AIDS Control

Programme (NACP) have mainly come from the demographic and sentinel survey studies of women attending antenatal clinics, sexually transmitted disease clinics and commercial sex workers. These sources of information may not necessarily be representative of university campuses and students. Meanwhile the development of effective targeted programme aimed at preventing HIV infection among university students will require a foundation of knowledge concerning their sexual behaviours and its social ramifications. Sadly enough very little is known about the sexual behaviours and attitudes that may influence the risk of KNUST students acquiring HIV infection. While studies on university students have been conducted elsewhere [12-15], it is important to recognize that different settings may have different experiences and behaviours that necessitate the importance of generating local data. For example, the scarcity of accommodation to house students on KNUST campus has led to the greater number of students living in rented houses and hostels in the satellite communities surrounding the university. This, in some cases, has led to the formation of intimate relationship between some of the students and some of the local residents and this could possibly lead to the spreading and transmission of HIV infection. This then calls for a comprehensive and continuous monitoring of the prevalence of HIV infection among the students as well as their knowledge and attitudes towards sex and sexuality. Therefore to understand that of KNUST students' knowledge and attitudes towards sex and sexuality, this study was undertaken to determine KNUST students' HIV sero-status in order to know their HIV prevalence in relation to their attitude, perception and knowledge of HIV/AIDS, sex and sexuality as well as HIV-related stigmatization.

2. METHODS

This was a cross-sectional study carried out at the Kwame Nkrumah University of Science and Technology (KNUST), a non-profit public-funded university, in Kumasi. KNUST has a student body known as Students against AIDS (SAA) under the office of the Dean of students. SAA has since 2009 been annually organising a programme known as “Know Your Status Campaign” where HIV advocacy and awareness creation and HIV testing is undertaken among KNUST students. Since its inception student participation is always around 1500 to 2000 and it is always assisted and facilitated by national organisations such as the Ministry of Education, Ghana AIDS Commission, National AIDS Control programme, etc. with qualified staff of KNUST hospital offering Voluntary Counselling and Testing (VCT) services and HIV testing. Therefore, in 2011 and 2012 editions, and in consultation and discussion with the Dean of Students and other stakeholders, we structurally surveyed some of the participating students’ knowledge of HIV/AIDS, sex and sexuality and HIV-related stigmatization through questionnaire administration. The survey was supplemented with the results from the HIV testing. Though the sample size was not statistically predetermined, resource-constraint made us limit the questionnaire administration to not more than four (400) hundred students in each year of the survey (2011 and 2012 editions).

2.1 Instrument

Administered was a four-part 48-item questionnaire designed by researchers for this study. Items covered were in four parts namely the socio-demographic characteristics such as age, sex, place of birth and marital status. Next was the students’ knowledge about sex and sexuality and this included questions on premarital sex, given and receipt of love letters, love proposal, physical involvement with members of the opposite sex, sexual abuse, etc. They were then asked questions on HIV and AIDS-related information including HIV transmission, testing, risk factors, stigmatization and protection. The questionnaire was first piloted on 10 students in order to assess the ease of completing the questionnaire, to determine whether the questions were easily understood and could be completed in a timely fashion. Following the results of the piloting phase, revisions were made and then finalized. Participation in the study was voluntary without

any form of coercion, however, due to the nature of the questions and the possible perceived threat of addressing issues of a sexual nature, the questionnaire was self-administered with no identifiers, providing anonymity to the respondents.

2.2 HIV Antibody Test

Subjects HIV Sero-status was determined by the serological testing for HIV antibodies in their blood. Ghana employs varieties of methods in performing the serological test of HIV antibody detection but the laboratory staff of KNUST hospital used Abbott Determine HIV 1/2 (Abbott Laboratories, Tokyo, Japan) for first line screening and OraQuick HIV 1 & 2 kit (OraSure Technologies, Inc. Bethlehem, Pennsylvania, USA) was used for confirmation. In the event that a discordant results were to be obtained between the two methods, a third method, SD BIO LINE HIV 1/2 (Standard Diagnostics, Inc. Suwon-si, Kyonggi-do, Korea) would have been used as deciding though they didn’t have to use SD BIO LINE method as there was no discordant results. These methods were used mainly because they were kits having both sensitivity and specificity same as the traditional Enzyme Immunoassays and Western Blot methods. Besides, these kits didn’t require any mechanized machinery, are easier to use and can be completed within a short time period in addition to not needing any specialized expertise before they can be performed. These kits contain mainly a cellulose membrane casket on which is incorporated immobilized selenium colloid antigen conjugate and a recombinant HIV 1 and 2 antigens and peptides.

Specifically about 50 microliter of serum obtained from a 2 milliliter venous blood taken from each participating student was put on the cellulose membrane casket. As the serum migrates through the cellulose membrane it reconstitutes the antigen conjugate and the HIV recombinant antigens and peptides and mixes with them. If the serum contains any HIV 1 or 2 antibodies this will bind to the recombinant HIV 1 or 2 antigens whereby a red line band would be formed at a particular site or where there is no HIV 1 or 2 antibodies in the serum no red line band would be formed.

2.3 Ethical Approval and Informed Consent

Since the whole programme was an ongoing student activity under the office of the Dean of

Students, permission was sought from the office of the Dean of Students who gave clearance and approval after review and input to the study protocol. Participation in the study was voluntary but the students were first briefed about the importance and relevance of the study after which those who consented to participate were requested to anonymously self-complete a questionnaire and underwent HIV testing carried out by qualified staff from the University Hospital.

3. RESULTS

3.1 Demographic Data

The two years results (2011 and 2012 editions) were put together giving us a total of 800 administered questionnaires. Out of the 800 questionnaire administered, 754 students completed and returned theirs which gave us a respondent rate of 94.3%. All the students who completed the questionnaire were among the over 1,500 students in each year (2011 or 2012) who consented to undergo HIV screening test. Respondents were made up of 586 (77.7%) males and 168 (22.3%) females distributed as 166 (22.0%) males and 73(9.7%) females in the first year, 157 (20.8%) males and 27 (3.6%) females in the second year, 97 (12.9%) males and 19 (2.5%) females in the third year and 166 (22.0%) males and 49 (6.5%) females in the fourth and final year, (Adequate mechanism was put in place to ensure that those who completed the questionnaires in 2011 never participated in 2012). On the age distribution none of the respondents was below the age of 18 years. As

many as 143 (19.0%) first-year students were between the ages 18 to 20 years, 65 (8.6%) students were between the ages 21 to 25 years while the remaining 31 (4.1%) first-year students were over 25 years. For the second year students only 14 (1.9%) students were between the ages 18 to 20 years, while 124 (16.5%) students were between the ages 21 to 25 years and the remaining 46 (6.1%) second-year students were over 25 years. For the 3rd and 4th year students none was below the age of 20 years, while 97 (12.9%) 3rd years and 184 (24.4%) 4th years students were between the ages 21 to 25 years and 19 (2.5%) 3rd years and 31 (4.1%) 4th years students were over 25 years. The overall median age was 20.7 years while the median ages for 1st, 2nd 3rd and 4th year students were 18.5, 20.2, 21.0, and 22.4 years respectively. None of the students was married (Fig. 1).

3.2 Sexuality and Sexual Behaviours

Five hundred (500) (66.3%) students have either received or written love letters before as against 300 (39.8%) who have never received nor written love letters. Similarly 512 (67.9%) respondents have either proposed love to someone or have had love proposed to them as against 242 (32.1%) who have never experienced any of these. Greater number of these occurred when the students were in the Senior High School. Four hundred and sixty-five (61.7%) students admitted having received pre-teen counselling on sex and sexuality. Again 520 (68.9%) students

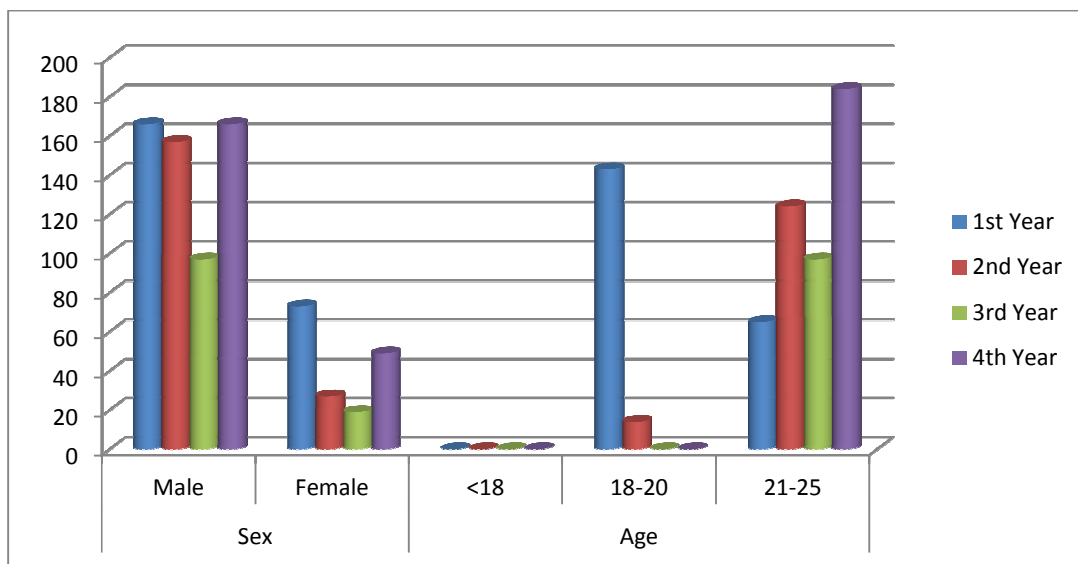


Fig. 1. Age and gender distribution of study subject

also admitted ever being involved with boy/girl friend relationship with 461 (61.1%) of them admitting still being in it. However only 183 (24.3%) students said boy/girl friend relationship means romance or sexual involvement with 475 (63.0%) of them saying it means either a special friend or future partner. Notwithstanding, 353 (46.8%) of the respondents have ever indulged in premarital sex as against 401 (53.2%) of them who have not. Of those who have indulged in premarital sex 213 (28.2%) of them used male condom as protective measure as against 4 (0.5%) who used female condom with 136 (18.0%) of them never using any protective measure. As to what has influenced their sexuality 305 (40.5%) respondents said religion

whiles 173 (22.9%), 131 (17.4%), 106 (14.1%), and 27 (3.6%) said friends, video/books, family members, and teachers respectively with 12 (1.6%) not disclosing theirs. Ninety-five (95) (12.6%) respondents also admitted ever being abused sexually before as against 659 (87.4%) respondents who have never been sexually abused. While 45 respondents of those who have been sexually abused said they were abused by either a parent or family member when they were between the ages of 10 and 18 years, 40 admitted being abused by people they did not want to disclose. Finally 710 (94.2%) of the respondents admitted having knowledge of homosexuality though only 22 (2.9%) admitted ever indulging in it (Tables 1 and 2).

Table 1. Behavioural practices of KNUST students

Variable	Determinant	1 st year	2 nd year	3 rd year	4 th year	Total
Writing of love letters	Yes	115	85	78	106	384
	No	124	99	38	109	370
Educational level at which love letter was written	Primary	9	0	2	2	13
	JHS	5	18	20	4	47
	SHS	97	65	48	92	302
	University	4	2	8	8	22
Receipt of love letter	Yes	185	120	70	152	527
	No	54	64	46	63	227
Educational level at which love letter was received	Primary	4	0	2	2	8
	JHS	38	6	7	20	71
	SHS	135	107	51	122	415
	University	8	7	10	8	33
Proposal of love to another person	Yes	160	130	99	143	532
	No	79	54	17	72	222
Educational level at which love proposal was made	Primary	6	2	0	0	8
	JHS	3	2	5	6	16
	SHS	133	104	76	41	354
	University	18	22	18	96	154
Receipt of love proposal from another person	Yes	161	115	74	14	492
	No	78	69	42	73	262
Educational level at which love proposal was received	Primary	5	5	5	9	24
	JHS	41	23	14	32	110
	SHS	101	78	41	46	266
	University	14	9	14	55	92
Participation in pre-teen counseling on sex and sexuality	Yes	152	106	74	133	465
Previous involvement in boy/girl relationship	No	87	78	42	82	289
	Yes	161	129	93	137	520
	No	78	55	23	78	234
	Yes	143	92	60	166	461
Currently in a love relationship	No	96	92	56	49	293

Variable	Determinant	1 st year	2 nd year	3 rd year	4 th year	Total
Knowledge of boy/girlfriend concept	Special friend	73	51	51	55	230
	Ordinary friend	55	14	9	18	96
	Future partner	55	59	38	83	245
	Romance partner	19	23	9	36	87
How long current relationship has been ongoing	Sexual partner	37	27	9	23	96
	<6months	32	5	7	29	73
	6months-1year	42	42	14	19	117
	1-2 years	18	8	12	47	95
	2-3 years	23	9	18	33	83
Average time spent with partner when together	>3 years	28	18	9	38	93
	<2 hours	45	55	27	104	231
	2-5 hours	68	28	27	52	175
Physical contact types used when with partner	>5 hours	30	9	6	10	55
	Hands holding	111	65	42	78	296
	Embracing	92	42	32	65	231
	Fondling	51	14	37	46	148
	Kissing	69	51	51	65	236
	Prolong kissing	37	14	37	46	134
Pre-marital sex involvement	Touching of genitals	46	9	19	37	111
	Sexual intercourse	65	33	42	42	182
Number of people engaged in pre-marital sex with	Yes	110	78	74	91	353
	No	129	106	42	124	401
Use of protective measure in pre-marital sex	1	46	23	28	39	136
	02-May	51	51	41	34	177
Type of protection used	>5	13	4	5	18	40
	Yes	69	46	51	51	217
Influence on sexual attitude	No	41	32	23	40	136
	Male condom	65	46	51	51	213
Influence on sexual attitude	Female condom	4	0	0	0	4
	Family	55	23	14	14	106
	Teachers	5	12	1	9	27
	Friends	51	46	32	44	175
	Videos, books etc	39	23	23	46	131
	Religion	85	76	46	98	305
	Other	4	4	0	4	12

3.3 HIV/AIDS-related Knowledge

There were no differences regarding HIV/AIDS knowledge among the students. In fact the levels of HIV/AIDS knowledge among the students

were similar, except for four first-year and four third-year students who claimed limited knowledge of it. On the question of how HIV is transmitted except 10 students (2 first-year and 8 second-year) who erroneously answered yes to

contracting HIV through hugging, dancing and eating, the rest of the students all knew correctly the various ways of how HIV can be transmitted. Similarly, greater number of the students could correctly identify risk factors associated with HIV transmission though there were some few students who thought age, race, gender, nationality and religious belief could be risk factors to HIV transmission. On the whole, the majority of the students (over 740 of them) felt that they have considerable knowledge about HIV/AIDS and that they know how to protect themselves from it (Table 3).

3.4 Students Knowledge and Perceptions about HIV

Six hundred and sixty (660) (87.5%) of the students reported that they knew where to access HIV testing both on campus and outside of campus, though until this exercise only 85 (11.3%) of the students reported that they had been tested before. Notwithstanding, all our study participants agreed to have themselves tested and all of them including those who were not even part of our study participants but have themselves tested (over 3,000 of them) tested negative to the HIV antibody test. Except 257 students who said they have not seen an HIV-infected person before 497 students said they have met an HIV-infected person before. Almost all the students said an infection with HIV is like any other infection and therefore persons infected with HIV ought to be treated like those having any other infection and not to be stigmatized. The results also showed that most students felt quite uneasy before initiating HIV testing. This uneasiness however reduced after the test (Fig. 2).

4. DISCUSSION

This study was undertaken to determine KNUST students' HIV sero-status in order to know HIV prevalence in relation to the students' attitude, perception and knowledge of HIV/AIDS, sex and sexuality as well as HIV-related stigmatization. Similar to a previous studies we have undertaken [16] we observed once again in this current study that the students of KNUST had adequate knowledge about HIV transmission and its associated risk factors yet they continue to engage in HIV transmission risky behaviours such as premarital sex and sex with multiple and/or casual partners. This notwithstanding, all the seven hundred and fifty-four (754) study participants as well as the 4,085 student

population who underwent HIV testing all tested negative. This confirms our earlier observation that HIV transmission in this country appears more likely to be concentrated in those with very low education and lower income earning [16]. This we think could be due to the fact that people with higher education, such as those studied, appear better informed and able to adopt behaviours that reduce their risk of HIV infection. This would further confirm our earlier observation and that of similar studies that good quality education is fundamental to reversing the spread of HIV/AIDS [16-19]. Whiles many similar studies have been conducted on university students elsewhere very few of them addressed the issue of HIV prevalence among the students. For example, in China where the socio-culture and the peoples' life style is completely different from those of us in the sub-Saharan African similar study carried out by Maimaiti et al., revealed that while most students of Xinjiang University had good knowledge about HIV and AIDS and its ramifications, the students have negative attitude towards HIV/AIDS where 15% of their 400 studied students reported having at least one high-risk behaviour related to sex and unprotected sex [17]. This study, however, did not address the issue of HIV prevalence among the students but in two similar studies carried out in Ethiopia, Tefera Belachew and his group reported a seroprevalence of 12.2% among 490 university students studied in Jimma University, Ethiopia [18] whiles Gashaw Andargie and his group reported a seroprevalence of 1.1% among 565 senior high school students studied in Gondar, Northwest Ethiopia [19]. In fact, Gashaw Andargie et al. even described the prevalence among the students studied as very low in that in a similar study carried out by them they found over 50% HIV prevalence in tuberculosis patients and 5% in rural and elderly patients implying HIV prevalence in the national population is already very high [19]. They also reported that those students found to be HIV infected were those who admitted of chewing chat, alcohol drinking, cigarette smoking, indulging in multiple sexual partners including patronizing commercial sexual workers services [18-19]. When these studies are compared with our study which was carried out in a country whose national HIV prevalence have been hovering between 1.1% and 1.3% [20] coupling with the fact that those students in our study who admitted indulging in HIV related risky behaviours also admitted of utilizing healthy choices of protecting themselves against HIV then the zero HIV prevalence obtained was not surprising. Though the design of the present

study did not lend itself to the specific role of good quality education in the findings obtained, we are persuaded to believe that the higher education being received by our studied participants would empower and provide them with knowledge and skills which would enable them make informed decisions and, as stated above, to adopt behaviours that would reduce their risk of HIV infection. Therefore, we think, the spread of HIV/AIDS would be contained

effectively if good education is pivoted at the centre of the response. Educated young women and men are more likely to know what HIV is, and how to avoid infection, because they are more likely to have the attitudes and skills that would enable them to resist pressure and to take responsibility for their own lives. They are more likely to utilize their knowledge and skills to make healthy choices, including protecting themselves from HIV.

Table 2. Sexual attitudes of KNUST students

Sexual abuse history	Yes	18	23	32	22	95
	No	221	161	84	193	659
Sexual abuse offender	Parent	0	5	5	5	15
	Family member	5	5	8	7	25
	Madam/master	0	5	0	5	10
	Teachers	0	0	0	0	0
	Religious leader	5	0	0	0	5
	Other	8	8	19	5	40
Age sexually abused	<10	0	10	8	8	26
	10-15	14	5	5	0	24
	15-18	0	0	0	6	6
	>18	4	8	19	8	39
Knowledge of homosexuality	Yes	221	166	116	207	710
	No	18	18	0	8	44
Involvement in homosexuality	Yes	4	0	0	18	22
	No	235	184	116	197	732

Table 3. Students knowledge on HIV/AIDS

Knowledge of ways of HIV/AIDS transmission	Direct contact with infected bodily fluid	216	180	115	203	714
	Penetrative sex	216	180	101	187	684
	Oral sex	152	101	92	138	483
	Blood transfusion	216	184	115	198	713
	Contaminated needles	212	180	111	198	701
	Mother-child transmission	203	180	92	198	673
	Hugging, dancing, eating with HIV/AIDS patient	2	8	0	0	10
Knowledge of risk factors associated with HIV transmission	Age	17	16	15	18	66
	Race	6	4	4	0	26
	Gender	47	30	12	20	109
	Sexual orientation	144	80	98	65	192
	Nationality	4	0	0	0	4
	Religion	6	6	8	7	27
	Unprotected sex with multiple partners	216	118	110	190	634
	Unprotected sex with HIV-positive person	189	168	101	189	647
	Other sexually transmitted diseases	132	98	88	100	410
	Sharing needles in intravenous drug use	185	100	106	110	501
	Receiving untested blood in transfusion	186	100	89	176	551

Knowledge of HIV voluntary testing and HIV/AIDS-related stigmatization

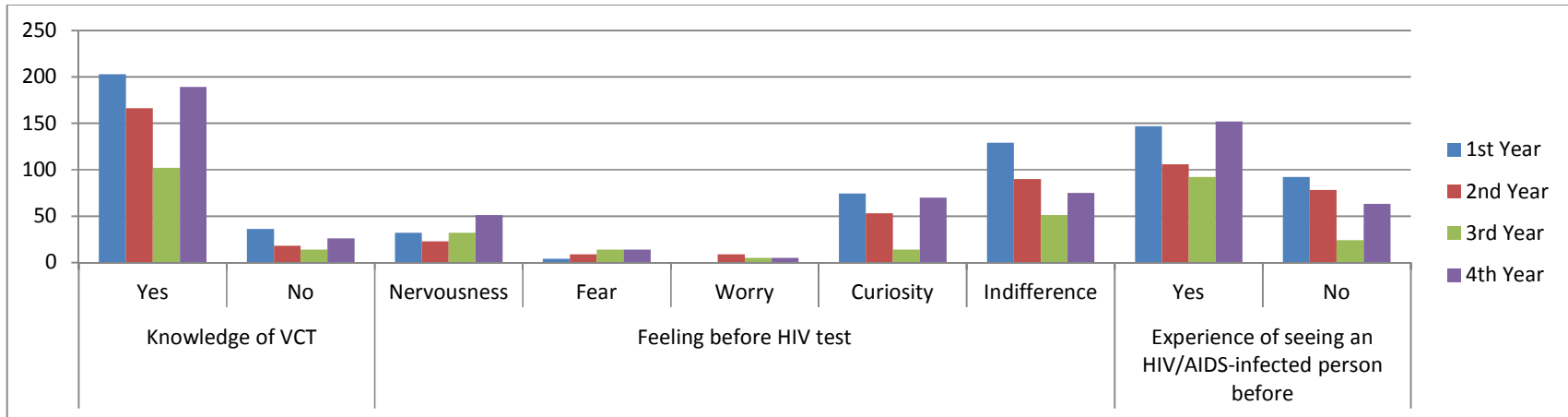


Fig. 2. Knowledge and perceptions about HIV

On the question of stigmatization against persons living with HIV/AIDS (PLWHA) the study revealed that students who are more knowledgeable about HIV infection and AIDS tend to have a greater willingness to show love and affection to PLWHA suggesting again that good quality education can play an important role in even changing peoples' perceptions about HIV infection and AIDS. Finally the revelation that HIV prevalent rate among the students studied is zero, it is very encouraging finding, suggesting that good education can certainly halt and reverse the menace of the HIV pandemic and therefore ought to be intensified.

5. CONCLUSION

In conclusion we can say that the finding that HIV prevalent rate among the students studied is zero suggests that our study participants, representing KNUST students, have adequate knowledge base about HIV transmission, its associated risk factors and ways of protection against it. Indeed almost all the 756 study participants stated correctly some ways of HIV/AIDS transmission such as direct contact with infected bodily fluid, through penetrative and oral sex, blood transfusion, use of contaminated needles and from mother to child mode of transmission. The students could also correctly identified unprotected sex with multiple partners, unprotected sex with HIV-positive person, sharing needles in intravenous drug use, receiving untested blood in transfusion and presence of other sexually transmitted diseases as some of the risk factors associated with HIV transmission. What is worrying is that in spite of this adequate knowledge about HIV/AIDS some of the students still indulged in HIV risky behaviours such as engaging in premarital sex and/or having sex with multiple or casual partners. Encouraging observation made about this, however, is that those students engaged in these HIV risky behaviours also admitted regular use of condom as protective measure. This we believe could be due to the level of education these students have had or still having which made them appeared better informed and thus able to adopt behaviours that reduce their risk of HIV infection. This would suggest that because these students are better informed through right education they are thus better able to make right choices that reduce their risk of HIV infection. This would further confirm the observation that [16] indeed good education is the bedrock underlying the fight against the HIV/AIDS pandemic and therefore tertiary institutions,

especially those in the Sub-Saharan Africa, should be encouraged to actively develop, promote, and implement HIV/AIDS education and prevention strategies on their campuses and communities.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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