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ARTICLE

HIV Counseling and Testing Uptake, Knowledge and Attitude and Influencing Factors among Student Nurses and Midwives in The Gambia: An Institutional-based Cross-sectional Study

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ABSTRACT

HIV counseling and testing (HCT) has become paramount in the prevention and control of HIV/AIDS worldwide. However, the uptake of HCT has been very slow globally, especially in sub-Saharan Africa. Student nurses formed the largest group undergoing health care training in the country compared to doctors and other health cadres. According to WHO, they are part of the most vulnerable group to HIV infection, judging by the fact that they interact more with patients/clients than other healthcare professionals. This study aimed to determine the prevalence of HCT uptake, knowledge, and attitude and evaluate influencing factors among student nurses and midwives in public nursing schools. An institutional-based cross-sectional study design was employed to collect data from 305 randomly selected nursing students and midwives using a validated and reliable self-administered questionnaire. Descriptive statistics (percentages, mean and standard deviation) and inferential statistics (chi square, logistics regression, one-way ANOVA and independent samples t-test) were used for data analysis using SPSS version 25.0. A p-value < 0.05 was considered for statistical significance. Out of the 305 students recruited for the study, 60.98% were females, with a mean age of 25.5 years old. About 58.4% of the participants had tested for HIV in the past. About 95.7% acknowledged the importance of HCT in the prevention and control of HIV/AIDS. HCT uptake among student nurses and midwives was influenced by factors ranging from an individual that are interpersonal challenges (such as concerns of friends), perceived susceptibility to the disease, lack of confidentiality, stigma and discrimination from health service providers. Therefore, these barriers can be addressed through an organized targeted health education intervention and advocacy programs across health training institutions in the Gambia and beyond.

Keywords: Barriers; Facilitators; HIV testing and counseling; Student nurses; Uptake; Attitudes

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1. Introduction

Human immunodeficiency virus (HIV) infection is now predominantly seen as a controllable condition due to treatment advances and care. However, without appropriate strategy or intervention, HIV can lead to acquired immune deficiency syndrome (AIDS), which may bring about morbidity, health burden and mortality [1]. Mitigating the rapid transmission of HIV requires concerted efforts and commitment. This involves widespread screening and testing to isolate persons who may miss opportunities to seek treatment and thereby unknowingly transmit the virus to others. According to WHO and other health organizations, the key strategy or intervention in the battle against HIV is through HIV counseling and testing (HCT). HCT still remains crucial in the global fight to reach universal access to prevention and timely HIV treatment and health care [1]. This can only be realized if people modify their behaviour or attitude towards HCT, especially among vulnerable populations. Additionally and most importantly, a decrease in the uptake of HIV counseling and testing among undiagnosed people is a barrier encountered at the healthcare provider level [2]. Besides the importance of clear and vivid protocols for HCT and treatment, knowledge and attitudes towards the acceptability of HCT to potential recipients and health professionals who have to administer the services and willingness of health professionals to provide, manage and treat HIV-positive people are essential prerequisites [3]. Reviewed literature demonstrated that HIV/AIDS and HCT attitudes are particularly effective among health workers and pre-service nurses [4,5]. Therefore, student nurses and midwives with good attitudes toward HCT could serve as good role models for educating clients on HCT and HIV/AIDS services in their future work environments [6].

Nursing students and midwives, the primary focus of this article, are considered the risky or vulnerable group in The Gambia. Several studies have indicated that a high percentage of university students like nursing students, ages 17-24 years old are usually sexually active. This strong urge for sexual exploitation peaks in the first year and second years of study. This significantly correlates with an increased risk of HIV infection especially among young women especially. Therefore, nursing students are an important constituency in the interventions against HIV/AIDS as many might be entering nursing schools before they are sexually active and yet fall within the age bracket where HIV infection peaks. Globally, around half of the people who acquire HIV/AIDS become infected before they turn 25 years and HIV/AIDS is the second most common cause of death among 20-24 years old [7]. As mentioned in UN General Assembly Special Session (UNGASS) on HIV/AIDS, young people aged 15-24 are an important cohort to monitor for population-level reductions in HIV incidence. Student nurses fit well in this population cohort as they are usually fresh secondary school leavers with little guidance from their parents during the period of study. Student nurses and midwives are part of this vulnerable group that often contacts their peers. Also, student nurses formed the largest group undergoing healthcare training in the country compared to doctors and other health cadres. Also, student nurses are usually in their youthful age and according to WHO, they are part of the most vulnerable group to HIV infection. Student nurses are also expected to provide HIV services upon graduation, judging by the fact that they interact more with patients/clients than other healthcare professionals. Furthermore, the 2013 National Demographic Health Survey (DHS) found a significantly high HIV prevalence among youth aged 15-24 at 0.3% [8]. This figure includes student nurses. Hence, given this tendency, preventive interventions that can limit the epidemic among the cream of our society and the larger population are crucial.

Despite the acceptance of the HCT model by African governments, the level of acceptance and utilization of this model by citizens has been met with mixed attitudes [9], and many studies across the African continent have tried to ascertain the level of HCT coverage and general uptake of this prevention strategy. However, outcomes to date have been poor, with high efficacy acceptance [8]. A variety of models could be used for HCT such as provider-ini-

tiated counseling and testing (PICT) as part of medical care, and client-initiated counseling and testing (CICT), often dubbed voluntary counseling and testing (VCT/HCT). Provider-initiated testing occurs in hospital settings where the test would be performed unless patients/clients decline. In contrast, client-initiated testing and counseling could be performed at various service delivery points ranging from health facilities, specially designed stand-alone sites, mobile communities, and home settings. Voluntary counseling and testing (VCT), currently known as HIV counseling and testing (HCT), was developed in the mid-1980s as the norm for those desiring to know their infection status. These services are cost-effective treatments that offer chances to raise awareness of HIV and preventative practices and are key components of HIV prevention programs [9].

Knowledge about HCT is an important pre-requisite to HCT utilization especially in high prevalence settings where many individuals tend to develop feelings of hopelessness and helplessness and harbor the belief that behaviour change is late. However, learning one's HIV status with prevention, counseling can be an important prevention and care strategy [10]. In the aspect of HIV/AIDS, it is crucial that everyone has adequate knowledge about HIV counseling and testing as a preventive strategy. The focus should not be centered on one receiving HCT but also on the benefits associated with the test and it enhances the demand for the services. Some studies indicate that community awareness was associated with significant uptake of HCT among women who received pre-test counseling [11]. However, little is known about the level of knowledge of HCT among student nurses and midwives in the Gambia. Notwithstanding, the 2013 national demographical health survey revealed that knowledge of places for HIV testing is higher among urban women and men than in rural areas. Moreover, despite high knowledge of the sources of HIV testing, only 39% of women and 19% of men have ever been tested. Also, Multiple Indicator Cluster Survey (MICS-6) reports, 2018 indicated that 62.5% of men knew a place to get tested, only 23.3% were tested and 22.4% of men had been tested and knew the most recent test result, and 8.0% had been tested in the previous 12 months and knew the result [7].

The correlation between attitude and health behaviours has been analyzed in many studies and behavioral theories suggested that a change in attitude can result in behaviour change. It is one of the main factors of intention to change or utilize a behaviour (HIV testing). Despite it being a determinant of intention to perform a behavior, the intention is not altogether as utilizing the service. An individual may have the intention to perform a task like an HIV test but fail to carry out that intention due to other conflicting interests and pressures. In a particular study, participants who had not been tested held a significantly more negative attitude toward HIV tests than participants who had been tested [12].

HIV uptake among nursing students in the Gambia is unknown, although they are part of the vulnerable youth population. However, a study in Nigeria showed that, the acceptance rate of HCT among students of tertiary institutions ranged from 8.3% to less than 30% in reported studies. This finding has important implications for HIV preventive strategies in the Gambia and other developing countries in sub-Saharan with a huge HIV/AIDS burden. Therefore, nursing students and midwives demonstrating high HCT acceptability could serve as peer educators among youths in the communities. The HIV uptake among young people aged 15-24 years old in 2007 was about 1.2% and 2.9% in males and females respectively according to the national demographical health survey 2013 [13]. Young people are vulnerable to HIV/AIDS due to their low awareness of sexual health; poor translation of safe sex practices; and limited condom use, since parents do not discuss sexual health issues with their children [7]. This significantly correlates with an increased risk of HIV infection, especially among young women. As a result, the importance of this study cannot be overstated, and it is supported by empirical data on the need to assess HCT utilization or uptake among student nurses and midwives in the Gambia, as they are vulnerable young adults.

Globally, numerous studies have outlined many barriers and facilitators that can influence the uptake of HIV counselling and testing among different subset of the population. Barriers and facilitators may also differ across countries and groups of people with different characteristics. Findings from many studies also grouped barriers related to HCT into five main domains based on the socio-ecological model (intrapersonal, interpersonal, institutional, community and policy levels). In other studies, the barriers are phrased differently but mean the same. For example, the intent to seek HIV counselling and testing was attributed or related to five attitude subscales namely: people's concerns, individual concerns, friends' concerns, the value attached to testing, confidentiality, and perceived susceptibility [14]. Therefore, the magnitude of each independent domain may vary across countries or continents. However, the influencing factors associated with HCT uptake among student nurses and midwives in the Gambia are not known.

Undoubtedly, this study aimed to explore the influencing factors associated with HCT uptake among student nurses and midwives in the Gambia. The study also examined utilization rate or prevalence, knowledge and attitude toward HCT uptake. The findings identified in this study will help policymakers to revisit some of the laws, regulations, or policies on HIV/AIDS and HCT services in particular in the country. Hence, these findings may trigger a need to overhaul some policies or regulations that impedes HCT uptake in the country.

2. Methods

2.1 Design and setting

A cross-sectional study design was used across three public nursing schools in different regions. The three public nursing schools in the country are: The Registered School of Nursing and Midwifery in Banjul (capital city); the School of Enrolled Nursing and Midwifery (Bansang town) and the School of Community health and midwifery (Mansakonko town). The School of Enrolled Nursing and Midwifery is located in the Central River Region in the rural part of the country. It is about 300 km from the capital Banjul and it has a two years nursing program and one-year midwifery program with residence or accommodation available for students.

Similarly, the School of Community Health and Midwifery is located in the Lower River Region about 200 km from the capital. It also has a two-year program and a one-year midwifery program. Unlike the other two schools, graduates are usually posted to the community and less often to minor health centres where they engage in the community. Students in this school are not provided with residence or accommodation, hence are forced to rent within the vicinity of the school and sometimes very far away from the school where lectures are conducted.

The School of State Registered Nursing and Midwifery is located in Banjul under the Gambia College with a three-year registered nursing program and 18 months diploma midwifery program. It has a more comprehensive nursing curriculum compared to the other two schools. It also accommodates some of its students within the school campus while the majority stay outside.

2.2 Sample and eligibility criteria

In this study, the target population is student nurses and midwives currently studying in three public nursing schools in The Gambia. Student nurses formed the largest group undergoing health care training in the country compared to doctors and other health cadres. Also, they are usually at a youthful age and according to WHO, they are part of the most vulnerable group to HIV infection. They are also expected to provide HIV services upon graduation judging by the fact that they interact more with patients/clients compared to other healthcare professionals.

Student nurses and midwives presently studying in public nursing schools and willing to participate were recruited. However, the study excluded support staff, lecturers and practicing nurses.

2.3 Sample size determination

In other to determine the sample size for the study, we used Yamane (1967) formula to calculate the number of student nurses and midwives to participate in the study. The formula, assuming a confidence interval of 95% and an error of 5%, with a population of 651 students from all three schools, yielded a desired sample size of 248 participants. However, 10% was added to cover the non-response rate and erroneous questionnaires after completion. Hence, the final desired sample size was 273. However, a total of 305 students volunteered to participate surpassing the desired calculated sample size for the study. Below is a breakdown of how the researcher arrived at the sample size for the study.

$$n = \frac{N}{1 + N(e)^2}$$

where n= the sample size; N = the student population; e= the error of 5% points (0.05).

10% was added to cover for non-response rate and erroneous questionnaires after completion. Hence, the final desired sample size was 273.

2.4 Sampling technique

A stratified random sampling technique was used to select participants from the three schools. To achieve this, an enumerated list of all the regular students was secured from the heads of the nursing schools for each of the academic years and used as the sampling frame. Proportional allocation was done for each of the academic levels i.e. year 1, 2, 3 (RN school only) and midwifery class. Stratified random sampling using the lottery method was used to draw samples from each of the respective academic levels or classes. A total of 305 students volunteered to participate in the study (**Figure 1**).

2.5 Measurement

A self-administered questionnaire segmented into three parts was used to collect data from participants. The segments comprised of the following parts: Socio-demographic information such as age, sex, marital status, educational status of parents, religious affiliation, place of residence; ethnicity, school, academic level, marital status, educational level of parents, wealth quintile, and local government area (LGA) of the participants. The variables used herein are from previously published studies and also the demographic health survey of the Gambia, 2018.

The items on knowledge are a subset of items provided by the World Health Organization as part

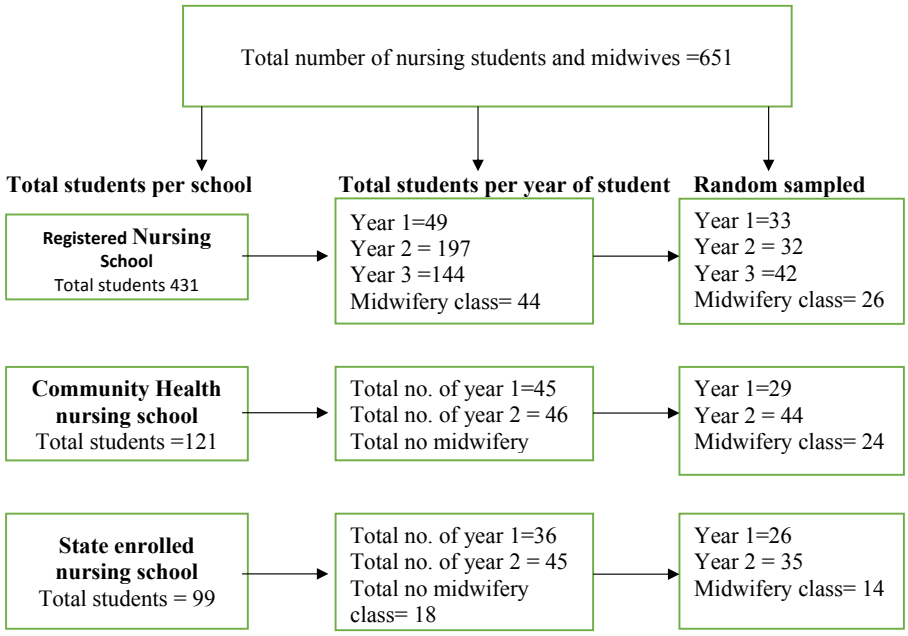

Figure 1. Schematic presentation of the sampling method.

of its research guidelines for studies related to HIV counseling and testing. This section contained questions about knowledge of HCT such as the source of information about HCT, perception of the benefits of HCT, the practice of HCT, satisfaction with HCT services, the reason for not taking HCT, willingness to HCT and preference of HCT method. The section contained 24 items with responses of yes/no and also multiple choices. Analysis was done based on the individual items mentioned above using descriptive analysis in the form of frequency, percentages and means.

For attitude, a 32-item HIV-Antibody Testing Scale was used (Boshamer CB, Bruce KE) [15]. This scale was validated and reliable as it was used in different previous studies in Africa and beyond with a Cronbach's alpha of 0.88. Responses were scored such that strong agreement with facilitator items was given 5 and strong disagreement was given 1. Reverse scoring was used for barrier items. Item scores were summed and high scores indicated a more favorable attitude toward HIV antibody testing. Participants' attitude was categorized as positive or negative attitude based on the total attitude score. An attitude score of more than or equal to the total mean score was regarded as a positive attitude and less than the total mean score was considered a negative attitude [16]. The test-retest reliability result for the HIV-Antibody Testing Scale showed good internal consistency with a Cronbach's alpha score of 0.813 for the present study. Equally, the knowledge questionnaire part had a good internal consistency with a Cronbach's alpha of 0.783.

2.6 Data collection

Data collection was carried out using the self-administered questionnaire with the assistance of data collectors in each school after permission was sought from the heads of schools. All the data collectors were trained prior to data collection. Data collectors in each school informed all students about the research prior to the data collection process. Student representatives were also used to inform their colleagues about the importance and benefits of the research. The time for data collection was communicated to all the lecturers and students in the three nursing institutions.

2.7 Statistical analysis

Data entry and analysis were done using Statistical Package of Social Sciences (SPSS) version 25 software. Descriptive and frequency analyses were used to analyze the socio-demographic characteristics of the participants, knowledge items and independent variables respectively. Categorical variables were presented as frequencies and percentages and chi square test was used to test for association. If the number of participants in one or more categories was less than five, Fisher's exact test was applied. Results were considered to be significant with a p-value < 0.05. Multivariate logistic regression was used to investigate the predictors or demographic variables associated with HCT uptake and the conditional method calculating odds ratio and 95% confidence interval was applied. One-way ANOVA and independent samples t-test were used to determine the mean difference between categories of the demographic variables and dependent outcomes for the attitude scale.

Factor analysis was also conducted to identify barriers and facilitators associated with HCT among student nurses and midwives using the 32 items on the HIV Antibody Testing Scale. A principal component analysis was used for facilitators and barriers using varimax rotation together with a scree plot for the extraction of factors. A cut-off point of 0.40 was applied for item inclusion in the interpretable factors and items with two or more loadings > 0.30 was considered cross-loading items and was assigned to a single factor with the highest loading [17]. Also, an eigenvalue of more than 1 point was considered for identifying factors using the scree plot. All the items loaded above the 0.40 cut-off.

2.8 Ethical considerations

Before the study, ethical approval was obtained from the Institute Review Board at Central South

University, Xiangya School of Nursing, China (IRB Number: E202044). Similarly, approval to conduct the research in the nursing schools was sought and approved by the Gambia Scientific Coordination Committee (GSCC) of the University of the Gambia. Confidentiality was maintained and participation was voluntary, and no incentives were provided for participation. Participants could withdraw from the study at their will at any time or stage of the study. Also, respondents were issued with a detailed information sheet about the study and a consent form was signed by participants willing to participate. Confidentiality was maintained and participants were not required to write any information that may reveal their identity. Participation was voluntary, and no incentives were provided for participation. Apart from time, there were no other potential risks related to the study participants or the information they provided. Furthermore, this study was not invasive therefore, no harm was anticipated to the participants. There was no repercussion or punishment to be meted on the students for declining to participate in the study.

3. Results

3.1 Socio-demographic characteristics of the participants

In this study, the response rate was 91% (305 submitted questionnaires out of 335 were accepted for analysis) and out of the 305 participants, more than half (60.9%) were females. The mean age and standard deviation for nursing and midwife students were 25.5 years ± 5.4. However, by age range, more than half of the participants were within the age group of 19-24, at 58.3%. HCT use was more widespread within the age range of 31 & above years at 80.0% compared to 19-24 years at 43.5%. The HIV counseling and testing uptake among midwifery students was also higher by 81.5% compared to 58.8% second-year students. Students from Janjanbureh as well as Mansakonko LGA chose HIV counseling more than other LGAs in the study. These LGAs are located in rural areas of the country, which are frequently plagued by a lack of resources. The Mandingo tribe was the most common ethnic affiliation of the participants at 40.9%, while about 92.1% were Muslims. In terms of distribution of participants by school, about 43.6% were from the Registered Nursing School of Gambia College, 31.8% from Community Health Nursing School, Mansakonko and 24.6% from State Enrolled Nursing, Bansang. The majority of participants were single 65.3% while almost one in every four students was married at the time of the study. About 36.1% were in the second academic year as shown in **Table 1**. Regarding the educational status of participant parents, almost half of the participants' fathers and two-thirds of their mothers had no education. Our participants' wealth quintile was largely in the middle index class at 48.5%, followed by the second wealth index at 25.3%. Approximately about half of the participants reported living with both parents while about one-third reported having only one rent alive and one in five reported losing all their parents. According to participants' LGA local of origin, Brikama has the most residents while Kuntaur had the lowest participants at 1.7%. Overall, about 57.1% were from urban areas of the country.

3.2 HIV counselling and testing uptake

HIV counseling and testing uptake among nursing students and midwives was 58.4% as shown in **Figure 2**. HCT utilization was more prevalent within the age range of 31 & above years, 32 (80%) compared to the 19-24 years of age 77 (43.5%). Also, HIV counseling and testing utilization were higher among the midwifery students, 53 (81.54) compared to second-year students, 87 (58.78). Students who are from the Local Government Area (LGA) of Janjanbureh opted for HIV counseling more than other LGAs, 18 (81.82%) followed by Mansanko LGA, 19 (79.17). These LGAs are situated in the rural part of the country which are often plagued by limited resources (**Table 1**).

Table 1. Socio-demographic characteristics and utilization of HCT (n = 305).

		Ever had HIV test			
Variable	**Frequency n (%)**	**Yes n (%)**	**No n (%)**	**Chi-square test**	***p*-value**
Age				38.342	0.001*
19-24 years	177(58.03)	77(43.50)	100(56.50)		
25-30 years	88(28.85)	69(78.41)	19(21.59)		
30 & above	40(13.11)	32(80.00)	8(20.00)		
Gender				0.136	0.712
Male	119(39.02)	71(59.66)	48(40.34)		
Female	186(60.98)	107(57.53)	79(42.47)		
Religion				9.136	0.003*
Islam	281(92.13)	171(60.85)	110(39.15)		
Christianity	24(7.87)	7(29.17)	17(70.83)		
Ethnicity				13.361†	0.090
Mandinka	125(40.98)	74(59.20)	51(40.80)		
Fula	68(22.30)	40(58.82)	28(41.18)		
Wollof	30(9.84)	19(63.33)	11(36.67)		
Jola	36(11.80)	23(63.89)	13(36.11)		
Manjago	14(4.59)	4(28.57)	10(71.43)		
Serere	13(4.26)	8(61.54)	5(38.46)		
Aku	7(2.30)	5(71.43)	2(28.57)		
Foreign	5(1.64)	0(0.00)	5(100.00)		
Marital status				42.110	0.001*
Married	88(28.85)	75(85.23)	13(14.77)		
Single	199(65.25)	94(47.24)	105(52.76)		
Divorced	5(1.64)	4(80.00)	1(20.00)		
Relationship	13(4.26)	5(38.46)	8(61.54)		
Academic class				21.628	0.001*
First year	88(28.85)	40(45.45)	48(54.55)		
Second year	110(36.07)	59(53.64)	51(46.36)		
Third year	42(13.77)	26(61.90)	16(38.10)		
Midwifery	65(21.31)	53(81.54)	12(18.46)		
Year Study				27.887	0.001*
3rd Year RN	42(13.8)	16(38.1)	26(61.9)		
2nd Year RN	32(10.5)	17(53.1)	15(46.9)		
1st Year RN	33(10.8)	22(66.7)	11(33.3)		
2nd Year CHN	44(14.4)	19(43.2)	25(56.8)		
Midwifery SEN	14(4.6)	1(7.1)	13(92.9)		
1st Year SEN	26(8.5)	14(53.8)	12(46.2)		
2nd Year SEN	35(11.5)	15(42.9)	20(57.1)		
Midwifery RN	26(8.5)	4(15.4)	22(84.6)		
1st Year CHN	29(9.5)	12(41.4)	17(58.6)		
Midwifery CHN	24(7.9)	7(29.2)	17(70.8)		
Residence				0.693	0.405
Urban	174(57.05)	80(45.98)	51(29.31)		

Table 1 continued

		Ever had HIV test			
Variable	**Frequency n (%)**	**Yes n (%)**	**No n (%)**	**Chi-square test**	***p*-value**
Rural	131(42.95)	98(74.81)	76(58.02)		
Schools				0.731	0.694
SEN School	75(24.59)	45(60.00)	30(40.00)		
CHN School	97(31.80)	59(60.82)	38(39.18)		
RN School	133(43.61)	74(55.64)	59(44.36)		
Parents alive				3.162	0.367
Yes	154(50.49)	94(61.04)	60(38.96)		
Divorced	23(7.54)	10(43.48)	13(56.52)		
One of them alive	108(35.41)	64(59.26)	44(40.74)		
Both of them not alive	20(6.56)	10(50.00)	10(50.00)		
Family type				0.143	0.705
Nuclear	157(51.48)	90(57.32)	67(42.68)		
Extended	148(48.52)	88(59.46)	60(40.54)		
Household wealth index				2.741†	0.611
Lowest	67(21.97)	34(50.75)	33(49.25)		
Second	77(25.25)	49(63.64)	28(36.36)		
Middle	148(48.52)	87(58.78)	61(41.22)		
Fourth	7(2.30)	4(57.14)	3(42.86)		
Highest	6(1.97)	4(66.67)	2(33.33)		
LGA of origin				19.340†	0.006*
Kanifing	91(29.84)	51(56.04)	40(43.96)		
Banjul	18(5.90)	7(38.89)	11(61.11)		
Brikama	107(35.08)	59(55.14)	48(44.86)		
Kuntaur	6(1.97)	6(100.00)	0(0.00)		
Janjanbureh	22(7.21)	18(81.82)	4(18.18)		
Mansankonko	24(7.87)	19(79.17)	5(20.83)		
Kerewan	15(4.92)	6(40.00)	9(60.00)		
Basse	22(7.21)	12(54.55)	10(45.45)		

*Significant at $p < 0.05$, †Fisher's Exact test used

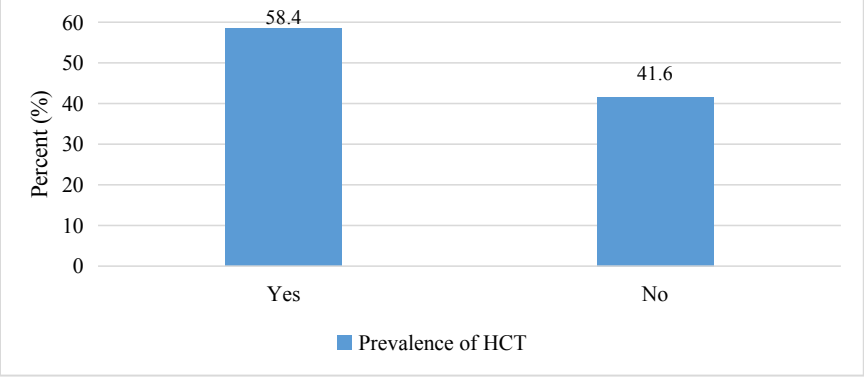

Figure 2. HIV counselling and testing uptake.

3.3 Knowledge on HCT

Regarding the source of information about HCT, the majority of the respondents heard of HCT before 290 (95.08%). The most common source of information was at school at 53.1% and followed by health facilities at 34.4% as shown in **Figure 3**. Of the 198 participants who had the HIV test, the most common reason for having the test was to know self-status at 65.3% and blood donation at 23.2%. 95.5% of those who underwent HCT mentioned that they were satisfied with the HCT services. Nearly all the participants (99.7%) agreed that HIV counseling and testing is important for the control of HIV/AIDS whilst 87.2% believed HCT is beneficial to both positive and negative persons. About 75.4% of the participant indicated that they will prefer the confidential-linked testing method compared to anonymous/self-testing. Participants were also asked as to who should go for HIV testing, 67.5% mentioned anyone at risk and 23.0% mentioned only those who are sexually active with multiple partners and about two-thirds preferred to receive counseling from a trained counselor compared to a nurse or doctor.

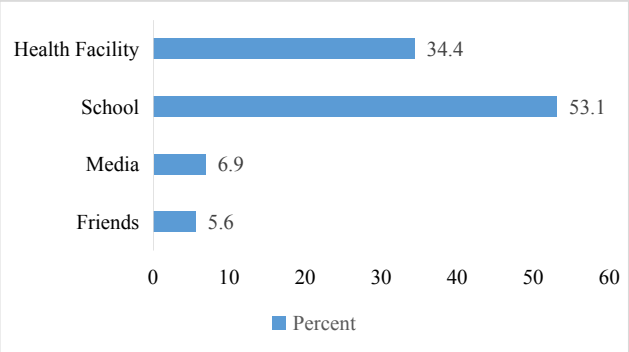

Figure 3. Source of information about HIV counseling and testing among respondents.

Despite many participants not having an HIV test in the past, 94.8% reported their desire to go for a test in the future. In terms of participants' health facility of preference to have an HIV test, 67.8% mentioned government health institutions having HCT services followed by a preference for private health facilities/clinics at 24.6%.

3.4 Attitude towards HCT

The mean attitude score was 113.94 ± 12.23. A total of 149 (48.9%) of the students showed a negative attitude towards HCT based on the overall mean attitude score. The results also showed that out of the students attending State Registered Nursing Schools, almost half (52.6%) of them showed a negative attitude towards HCT compared to community health nursing schools (46.6%) and state-enrolled nursing schools (43.3%).

The majority of the students agreed (94.1%) that it is very important to seek HIV and 86.9% rejected the statement: "HIV testing is unnecessary for me, as I feel healthy". However, about one-third of the participants assumed that everyone who is tested is infected with HIV, while 19.7% stayed neutral about this assumption (**Table 2**). Further analysis revealed the same trends in participants' opinions on HIV test information being kept very confidential by the medical staff who do the testing, the tendency to be judged or ignored by friends who knew they had done the test, and a very low proportion of neutral stands on this item. Additionally, more than half of the students disagree with the possibility of being positive for HIV/AIDS unknown to them, as well as having intercourse with a person who was at risk for HIV/AIDS.

3.5 Socio-demographic variables associated with HCT uptake

To explore the association between demographic variables and HCT uptake, chi square analysis was conducted. The analysis revealed a statistically significant association between six independent variables (age, religion, marital status, academic year of study, academic class by school and LGA) and HIV uptake as shown in **Table 1**. Age was statistically significant ($\chi^2 = 38.342$, $p < 0.001$), religion ($\chi^2 = 9.136$, $p = 0.003$), academic class of study participants ($\chi^2 = 21.628$, $p < 0.001$), marital status ($\chi^2 = 42.110$, $p < 0.001$) and year of study by a school

Table 2. Frequency analysis of items on attitude among nursing students (n = 305).

Items	Strongly Agree/ Agree n(%)	Neutral n(%)	Strongly disagree/ Disagree n(%)
HIV-antibody testing is not really confidential	67(22.0)	54(17.7)	184(60.3)
I would not want anyone to know if I got an HIV test.	148(48.5)	60(19.7)	97(31.8)
HIV testing is unnecessary for me, as I feel healthy	21(6.9)	19(6.2)	265(86.9)
I consider going for HIV counselling and testing extremely humiliating	39(12.8)	28(9.2)	238(78.0)
People assume that everyone who is tested for HIV is infected with HIV.	133(43.6)	27(8.9)	145(47.5)
Admitting that you should be tested for HIV means that you have engaged in immoral behavior	27(8.9)	17(5.6)	261(85.6)
I am afraid that if I were tested for HIV, my name would go into public record	67(22.0)	31(10.2)	207(67.9)
Anyone who is tested for HIV is dirty.	8(2.6)	6(2.0)	291(95.4)
It would be embarrassing to get tested for HIV	25(8.2)	20(6.6)	260(85.2)
People would assume I have HIV if I decided to get tested	106(34.8)	60(19.7)	139(45.6)
I am afraid someone would find out I was tested for HIV	85(27.9)	53(17.4)	167(54.8)
I would be embarrassed if my friends found out that I had decided to have HIV test.	61(20.0)	45(14.8)	199(65.2)
I would not get tested for HIV because I would be asked information that was too personal	41(13.4)	35(11.5)	229(75.1)
I do not have time to get an HIV test	24(7.9)	19(6.2)	262(85.9)
My friends would treat me badly if I were tested for HIV	59(19.3)	69(22.6)	177(58.0)
HIV test information is kept very confidential by the medical staff who do the testing.	49(16.1)	40(13.1)	216(70.8)
My friends would not look down on me if I were tested for HIV	135(44.3)	54(17.7)	116(38.0)
My friends would support my decision to get an HIV test	37(12.1)	69(22.6)	199(65.2)
HIV tests give accurate results	28(9.2)	51(16.7)	226(74.1)
It is extremely useful to test for HIV	15(4.9)	3(1.0)	287(94.1)
I would be comfortable talking to an HIV counselor about personal behaviors that place me at risk for HIV infection	31(10.2)	18(5.9)	256(83.9)
My friends would look down on me if I were tested for HIV	113(37.0)	69(22.6)	123(40.3)
My friends would not treat me any differently if I were tested for HIV.	121(39.7)	80(26.2)	104(34.1)
I would like to be alone when doing the test	17(5.6)	12(3.9)	276(90.5)
I trust the HIV test counselors and 1s to keep my information confidential.	27(8.9)	39(12.8)	239(78.4)
It would not bother me if someone I know sees me going to get an HIV test	107(35.1)	45(14.8)	153(50.2)
I could easily discuss HIV-antibody testing with my family.	49(16.1)	35(11.5)	221(72.5)
I consider going for HIV counselling and testing extremely frightening	74(24.3)	44(14.4)	187(61.3)
Testing and counselling is a pleasant experience	87(28.5)	45(14.8)	173(56.7)
There is a possibility that I have HIV and AIDS	166(54.4)	52(17.0)	87(28.5)
I may have had sex with someone who was at risk for HIV and AIDS	181(59.3)	29(9.5)	95(31.1)
I am at risk of HIV and AIDS	99(32.5)	38(12.5)	168(55.1)

(χ^2 = 27.887, p = 0.001) and LGA (χ^2 = 19.340, p = 0.003) (**Table 1**). Other influencing factors associated with HIV counselling and testing were attitude (χ^2 = 7.720, p = 0.005), heard of HCT before (χ^2 = 6.521, p = 0.011), HCT availability (χ^2 = 8.336, p = 0.004) and knowing where to get HCT services (χ^2 = 12.283, $p < 0.001$).

Four variables showed a statistically significant relationship with HCT uptake. The model was statistically significant using the forced entry method (χ^2 = 71.219, $p < 0.001$) which clearly showed its capability of detecting between participants who utilized HCT and those who did not. The overall explanation of the model was 28% (Cox & Snell R^2) and 20.8% (NagelKerke R^2) of the variance in the utilization of HCT.

Comparing the determinants of HCT uptake among the participants, the analysis showed Christians were five times more likely not to utilize HCT services compared to Muslim participants [OR = 5.272, 95% CI (1.839-15.112), p =0.002]. Similarly, participants who are single are four times more likely not to undergo HIV counselling compared to married participants [OR = 4.265, 95% CI (1.866-9.746), p = 0.001]. Also, participants who are in a relationship were seven times more likely not to take an HIV test compared to married students [OR = 7.361, 95% CI (1.768-30.656), p = 0.006]. Furthermore, participants within the age range of 25-30 years are more likely to undergo HIV testing than those within the age range of 19-24 years [OR = 0.282, 95% CI: (0.14-0.567), $p < 0.001$]. In academic class comparison, midwifery students were 2 times more likely to utilize HCT [OR = 2.718, 95% CI (1.124-6.575), p = 0.027] compared to third-year students as shown in **Table 3**.

3.6 Influencing factors associated with HCT uptake

The HIV Testing Antibody Scale (HTAS) with 32 items was used to identify factors influencing HIV

Table 3. Logistic regression on socio-demographic factors influencing HCT uptake (n = 305).

			95% CI for aOR		
Predictors	**B (regression coefficient)**	**aOR**	**Lower**	**Upper**	**P-value**
Marital status					
Married (Reference category)	1				
Single	1.45	4.265	1.866	9.746	0.001*
Relationship	1.996	7.361	1.768	30.656	0.006*
Divorced	0.137	1.147	0.096	13.75	0.914
Academic class					
First year (Reference category)					
Second year	1	2.718	1.124	6.575	0.027*
Third year	–0.014	0.986	0.332	2.925	0.979
Midwifery	0.472	1.604	0.537	4.788	0.397
Age of participants					
19-24 years (Reference category)	1				
25-30 years	–1.265	0.282	0.14	0.567	0.001*
31-50 years	–0.493	0.611	0.171	2.184	0.448
Religion					
Islam (Reference category)	1				
Christian	1.662	5.272	1.839	15.112	0.002*
Constant	–2.537	0.079			0.262

*Statistical significance p value < 0.05, aOR = adjusted Odds Ratio, CI = Confidence Interval.

counselling and testing uptake. The data was adequate for factor analysis with an overall Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) of 0.759 for the overall scale. The instrument was further sectioned into two subscales of facilitators and barriers associated with HIV counselling testing. The facilitators comprised 17 items and the barriers are 15 items in total. To identify facilitators and barriers associated with HIV counseling and testing among nursing students, factor analysis using principal component and Varimax rotation was used for the different subscales.

3.7 Facilitators to HIV counseling and testing

The items recommended as facilitators were feasible for factor analysis (KMO = 0.685). A total of five factors with an Eigenvalue more than 1 were recognized using the Scree test. These factors accounted for a total of 54.7% of the variance in scores. The identified factors and their loadings are tabulated in **Table 4**.

The factors were interpreted as relating to: 1 = support of friends/partners, 2 = positive perceived susceptibility, 3 =personal concerns about HCT, 4= assured confidentiality and support and 5 = fear about HCT, disclosure, stigma & discrimination. Items are assigned to the scale with highest loading (in bold).

Factor one (Eigenvalue = 3.09) accounted for an 18.2% variance in the responses, which is largely concerned with support from friends or partners in relation to HCT uptake. The factor comprised of items about the concerns of friends' feelings/reactions or support towards HIV counseling and testing. Items such as "my friends would not treat me any differently if I were tested for HIV" and "my friends

Table 4. Facilitator items and factor loadings for the HIV antibody testing scale (n = 305).

Items	**Factors**				
	1	2	3	4	5
My friends would not treat me any differently if I were tested for HIV.	0.787	–0.03	0.122	0.041	–0.161
My friends would look down on me if I were tested for HIV	*–0.768*	–0.167	0.032	0.076	–0.008
My friends would not look down on me if I were tested for HIV	0.653	0.006	0.006	0.258	0.146
It would not bother me if someone I know sees me going to get an HIV test	0.372	–0.053	0.244	0.221	–0.278
My friends would support my decision to get an HIV test	0.347	–0.117	0.322	0.286	–0.038
I may have had sex with someone who was at risk for HIV and AIDS	–0.047	0.82	–0.058	–0.01	–0.079
There is a possibility that I have HIV and AIDS	0.065	0.82	–0.016	0.171	–0.054
I am at risk of HIV and AIDS	0.061	0.742	0.136	–0.069	0.065
HIV tests give accurate results	–0.003	0.123	0.71	–0.012	–0.128
I would be comfortable talking to an HIV counselor about personal behaviors that place me at risk for HIV infection	0.032	–0.074	0.689	0.097	0.245
It is extremely useful to test for HIV	0.075	0.088	0.678	0.063	0.228
I could easily discuss HIV-antibody testing with my family.	0.164	–0.089	0.494	0.385	–0.119
I trust the HIV test counselors and nurses to keep my information confidential.	0.232	0.044	–0.002	0.746	0.222
HIV test information is kept very confidential by the medical staff who do the testing.	0.068	0.068	0.089	0.71	0.079
Testing and counselling is a pleasant experience	–0.031	0.014	0.159	0.621	–0.326
I consider going for HIV counselling and testing extremely frightening	–0.006	–0.023	0.048	–0.108	0.764
I would like to be alone when doing the test	–0.081	–0.06	0.219	0.283	0.61

would not look down on me if I were tested for HIV" loaded highly in this factor (**Table 5**). A total of five items aligned under this factor accruing the majority of the items under this subscale. Support and positive attitude of friends is an important facilitators associated with HIV counselling and testing among nursing students. Therefore, the attitude of peers, partners or family members can immensely facilitate the uptake of HCT among nursing students.

The second factor (eigenvalue = 2.02) accounted for 11.86% of the variance and is associated with the intrapersonal level factors under the socio-ecological model. It is mainly concerned with the individual's perceived susceptibility to HIV/AIDS infection and the need for HCT. Self-evaluation is a crucial ingredient in promoting the utilization of HCT supported by cross-cutting factors like knowledge, motivation and ability to act or take a decision. The following items loaded highly: 'There is a possibility that I have HIV and AIDS', 'I may have had sex with someone who was at risk for HIV/AIDS' and 'I am at risk for HIV (**Table 4**).

The third factor (eigenvalue = 1.69) with an overall variance of 9.96% is related to personal concerns about HCT as a whole. The value of HCT, the attitude of staff and family members are key to facilitating the uptake of HCT. The utilization of HCT will be enhanced if these sub-factors are addressed at our health facilities where services are rendered. Items that loaded high included 'HIV tests give accurate results', 'I would be comfortable talking to an HIV counselor about personal behaviors that place me at risk for HIV infection', 'It is extremely useful to test for HIV' and 'I could easily discuss HIV-antibody testing with my family'. They clearly demonstrated that if a good reception is accorded to clients at the health institution they will be more than willing to discuss further HCT with family members thereby

Table 5. Barrier items and factor loadings HCT uptake on HCT scale (n = 305).

	Factors				
Items	1	2	3	4	5
I would not get tested for HIV because I would be asked information that was too personal	0.722	0.135	0.075	0.09	0.14
I do not have time to get an HIV test	0.69	0.315	–0.22	–0.057	–0.085
I would be embarrassed if my friends found out that I had decided to have an HIV test.	0.675	0.099	0.328	0.206	0.108
I am afraid someone would find out I was tested for HIV	0.657	0.047	0.374	0.21	0.057
My friends would treat me badly if I were tested for HIV	0.417	–0.041	0.389	0.255	–0.117
Anyone who is tested for HIV is dirty.	0.077	0.759	0.068	0.039	0.043
Admitting that you should be tested for HIV means that you have engaged in immoral behavior	0.028	0.668	0.126	0.133	–0.054
HIV testing is unnecessary for me, as I feel healthy	0.183	0.579	0.058	–0.272	0.018
I consider going for HIV counselling and testing extremely humiliating	0.268	0.509	–0.072	0.342	0.231
People assume that everyone who is tested for HIV is infected with HIV.	–0.015	0.181	0.717	–0.105	0.092
People would assume I have HIV if I decided to get tested	0.4	–0.096	0.704	–0.016	–0.147
I am afraid that if I were tested for HIV, my name would go into public record	0.102	0.374	0.537	0.265	0.232
I would not want anyone to know if I got an HIV test.	0.221	–0.058	–0.088	0.784	0.036
It would be embarrassing to get tested for HIV	0.082	0.384	0.34	0.566	–0.051
HIV-antibody testing is not really confidential	0.088	0.027	0.044	0.009	0.948

increasing the uptake as shown in **Table 4**.

Factor four (eigenvalue = 1.85) accounted for a 7.56% variance in the responses and mainly comprised items concerned with confidentiality and privacy. The items that loaded more with this factor are: 'I trust the HIV test counselors and nurses to keep my information confidential'. 'HIV test information is kept very confidential by the medical staff who do the testing'. 'Testing and counselling is a pleasant experience'. Clients would be motivated to utilize HCT if their privacy and confidentiality is assured by health staff and family members (**Table 4**).

The fifth factor (eigenvalue = 1.21) accounted for 7.13% of the variance in the response and is mainly concerned about the apprehension/fear and stigma associated with an HCT and a possible positive result. The items that loaded strongly with the factor are: 'I consider going for HIV counselling and testing extremely frightening' and 'I would like to be alone when doing the test' (**Table 5**). Demystifying the fear factor could be a great motivator for the uptake of HCT among nursing students and the general population at large.

3.8 Barriers to HIV counseling and testing

Similarly, the barrier items in the HIV testing Antibody scale were also applicable for factor analysis (KMO = 0.810) and five factors with an Eigenvalue more than 1 were identified using the Scree test. The factors accounted for a total of 59.21% of the variance in scores. The identified factors and their loadings are tabulated in **Table 5**.

The first barrier factor associated with HCT utilization had an Eigenvalue of 3.96 and accounted for 26.43% of the variance in the participants' responses. A total of five items aligned with this factor. The items contained in this factor are mostly about personal concerns and about peers/friends, partners' reactions to HIV counseling and testing. Five items loaded with this factor and item: 'I would not get tested for HIV because I would be asked information that was too personal' scored highly followed by the item "I do not have time to get an HIV test". Lack of support or negative stereotype from peers or friends can adversely deter individuals from HCT services as shown in **Table 5.** The second barrier factor with an eigenvalue of 1.58 and total response variance of 10.53% and a total of four items loaded strongly with this factor. The factor is mainly concerned with the value or perception attached to HCT by clients. Items such as: 'Anyone who is tested for HIV is dirty" and "admitting that you should be tested for HIV means that you have engaged in immoral behavior" scored highest followed by the item; 'HIV testing is unnecessary for me, as I feel healthy' as indicated in **Table 5**.

The third barrier factor (eigenvalue 1.28) had an overall response variance of 8.51% in which three items loaded strongly with the factor. The three items that aligned with this factor are mostly concerned about the concerns of people with regard to HCT. Items such as 'people assume that everyone who is tested for HIV is infected with HIV', 'people would assume I have HIV if I decided to get tested' and 'I am afraid that if I were tested for HIV, my name would go into public record'. The fourth barrier factor (eigenvalue = 1.06) had an overall response variance of 7.06% in which only two items loaded strongly. The two items that aligned with this factor are concerned "*privacy & stigma associated with HCT and attitude of staff".* The two items are: *"*I would not want anyone to know if I got an HIV test" and "It would be embarrassing to get tested for HIV".

The fifth barrier factor (eigenvalue = 1.002) had an overall response variance of 6.68% and only one item loaded strongly with the factor which is *concerned about confidentiality* (*HIV-antibody testing is not really confidential).*

4. Discussion

Our findings revealed that a majority (58.4%) of the students had been tested for HIV before. This figure is much higher than the 8% for males and the 14% for females reported nationally for reproductive-aged adults (ages 15-49) in the 2018 Multiple Indicator Cluster Survey (MICS) in The Gambia. Also, the proportion of those who tested was higher

than the 3% for males and the 9% for women reported for young adults (15-24 years) in the same national survey. The finding followed a similar trend among studies conducted in Ghana and also in Zambia [18,19] among nursing students. It also appears that even among would-be nursing professionals HCT uptake was not at hundred percent which signifies that there are some factors that hinder HCT uptake as observed in a study among university students in Nigeria. In that particular study results showed only about half (50.7%) of the participants had HCT [20].

The finding also showed that the majority of the students were aware of the importance of HCT in the prevention of HIV/AIDS and yet still the proportion of those who tested was not impressive. It was therefore evident that the student's knowledge of when and where to test for HIV did not again translate to the expected behaviour of seeking HCT services. This disparity has been reported in other studies [11] and also a study conducted in Zambia further showed that despite the majority of students who demonstrated a willingness to undergo HCT, few actually had the test unless there is an underlying illness [21]. All the nursing schools from where the participants are drawn have very close proximity to health facilities that offer HIV counseling and testing services yet still there was no hundred percent HCT utilization. The explanation for this scenario could be a result of self-perception of not being susceptible to the disease or that feeling of absolute well-being which is common among young adults.

The result showed that age, gender, marital status, religion, academic year, school of attendance and residence (LGA) were significantly associated with HIV uptake. Our observations seemed to show that HCT utilization increases with increasing years among students. This was clearly demonstrated in the results where participants between 25-30 years and 31 years and above were more likely to have HIV tests compared to participants between 19-24 years of students. However, these findings contradict other studies from sub-Saharan Africa that found younger adults more willing than older people to be tested for HIV [22,23]. The reason for the correlation between increasing age and HCT utilization could be due to the fact that as respondents grow in age, they engage into conjugal relationships that may predispose them or their partners to certain conditions that may increase their perceived susceptibility and vulnerability to HIV.

Our finding showed more male students testing for HIV compared to females. These results were the opposite or not in alignment with the national trend that males are less likely than females to have been tested for HIV in the Gambia and in other studies from across sub-Saharan Africa [24]. Also, this finding is non-congruent with findings from other studies done in Ghana and Kenya [25]. The utilization of HCT services among females as realized in most sentinel surveys or demographic health surveys could be due to the ongoing prevention of mother-to-child transmission program during antenatal services in The Gambia which requires every pregnant female who reports to the health facilities to undergo HIV testing as a protocol of the policy. Furthermore, gender inequity poses a great challenge to HCT uptake especially in sub-Sahara nations (Ghana, Gambia, Nigeria, Uganda, etc.) where the sole authority or power and responsibility of healthcare-seeking behaviours depend on men [26]. In the Gambia men may refuse HCT service as a show of strength or dominance or self-confidence which is very typical in many African homes. If the wife suggests HCT, this may be seen as undermining the role of the man as a decision-maker.

Furthermore, student nurses in the third year of study and midwifery class were two times more likely to utilize HCT services compared to those in academic years 1 and 2. These findings suggest that the higher the educational level of the student, the more likely that they will utilize HTC services. This finding was similar to a study done in Addis Ababa which predicts that the educational year is positively correlated with HCT uptake [27]. This finding could be interpreted as the more time students spent on the educational ladder the more likely they will utilize HCT services. In addition, our study showed that marital status was significantly associated with HTC

uptake. Our finding also showed that divorcees were equally more likely to undergo HIV counselling and testing than students who are single. This finding corroborated with other studies [28] across Africa among student nurses. In many parts of sub-Saharan Africa, the fear of divorce or broken marital relationships which may result in potential abandonment or even violence can serve as a potential deterrent to the uptake of HTC services [29]. Our findings are also aligned with findings from a Jamaican study which revealed that married persons were more likely to report previous HIV testing [30] than unmarried persons. The high figures among married and divorcees may be partially due to the parent-to-mother-child transmission program which offers routine HCT services to all pregnant mothers and partners. Yet still it could be related to the fact that young unmarried persons see themselves as less susceptible to HIV.

On HCT, the findings revealed that students who are aware were more likely to utilize HCT services compared to those who are not. This finding was similar to studies done in Nigeria and Uganda among youths [31,32]. This finding further emphasized the need to strengthen awareness campaigns about HCT services rather than concentrate solely on facts about HIV/AIDS. With regards to the preferred person for HCT, most of the participants preferred trained counselors to doctors and nurses. This finding was different from other similar studies in Ethiopia [33]. Our study also showed a majority of participants were willing to go for HCT in the future. This finding was similar to a study conducted in Mersa Town of Harbu district, Ethiopia [34]. This high proportion of students willing to undergo HCT was not parallel with the actual use of HCT services.

On attitude towards HCT, our findings showed a little over half of the student nurses and midwives had a positive attitude toward HCT uptake. The proportion of students with positive towards HCT was far lower compared to a study conducted in North West Ethiopia which revealed 73.3% of a student had a positive attitude toward HCT uptake [34]. This disparity between the current study and other studies with a high proportion of positive attitudes toward HCT could be a result of numerous factors. The explanation for the unimpressive proportion in this current study could be related to inadequate knowledge of HCT as demonstrated in our study. Our study also revealed that students with stigmatizing attitudes were less likely to utilize HCT than those who had a positive attitude toward HCT [35]. This is because stigma is seen as a barrier to HCT uptake which makes people less enthusiastic to seek HCT. The finding aligns with the finding from a study done in Mersa Town, Ethiopia among adults which indicated that persons with stigmatizing attitudes were less likely to utilize HCT services compared to those with positive attitudes [34]. Similarly, a study in South Africa also reported consistent findings [12].

On the socio-demographic variables associated with attitude towards HCT uptake, previous residence and marital status were significantly associated with attitude towards HCT. The finding showed that students who reside in rural areas showed more stigmatizing attitudes towards HCT compared to those from urban areas. Also, the result showed that married students showed a more positive attitude towards HCT compared to students who are single or in a relationship. This finding was similar to a study conducted among students at Addis Ababa University [36]. The plausible explanation for this observation could be related to the fact that students from rural areas lack good information about HCT due to adequate access to news outlets/media. Also, married students are mature and may have undergone HCT before.

Aside from the socio-demographic factors explored in this present study, we also sought to determine other influencing factors associated with HIV uptake. Results from factor analysis showed that HCT uptake was associated with five main barriers. These barriers are ranked as follows: Concerns about negative stereotyping from friends, concerns of people, personal concerns about HCT, privacy & attitude of health staff and lack of confidentiality and support. These findings were similar to a study conducted in Kenya by Rose Mwangi et al. [14]. In this study the most important barrier associated with HIV up-

take was personal concerns and concerns of friends which are strongly associated with stigma and discrimination. Therefore, stigma and discrimination are major barriers to HCT uptake among students. Therefore, when students have in mind that they will be stigmatized and discriminated against for having an HIV test, there is a strong likelihood that they will stay away from undertaking HIV services. The second barrier is related to a lack of adequate knowledge of the benefits of HCT. Hence participants see HCT as valueless and not worth undertaking, thus, it is crucial that youths are well educated on the importance and value of HCT so as to increase uptake. This was evident among those participants who did not undertake HCT in our current study who mentioned that self and partner mistrust was the main reason for not undertaking the HIV test. The third barrier observed in this study was peoples' concerns in which the major concern expressed was the risk of their status being exposed to sexual partners or other people within the community. These types of concerns are common throughout Africa [37,38]. Many studies showed that adults willing to be tested usually prefer to be counseled and tested by someone who does not know them hoping that their results will not be exposed [39]. Similarly, fear of rejection from partners or family members or friends is related to this particular barrier and very common in many settings in Africa including the Gambia. It is therefore imperative that testing is done in very secure health institutions where services are sought. The fourth factor or barrier is privacy and the attitude of staff at health facilities which can hinder the uptake of HCT. The barrier is also reported in a study conducted in Ghana among nurses [40]. Health staff is supposed to show a positive attitude towards clients and equally motivate and encourage them to seek for services to enhance good health. Negative attitudes towards patients/clients could hinder the uptake of services. Similarly, maintaining privacy during service delivery is paramount and can encourage more clients to seek services. Therefore, lack of privacy and negative attitude of staff can seriously hinder the uptake of HCT services across the different cohorts of the population especially the youths. Lack of confidentiality is another barrier reported in this current study. This barrier was also mentioned in a study conducted in Ghana among student nurses [40]. Lack of confidentiality can adversely decrease the uptake of HCT among trainee nurses and midwives. Clients generally feel insecure or worried that their private information may be shared with loved ones or exposed to the general public. This is very common especially in an African country where secure data storage is still a challenge. This is also coupled with the fact that those offering the service may be known to you or your family members or friends hence the fear that the vital information may be shared with them.

On the facilitators associated with HIV counseling and testing, our study revealed that support from friends/partners or family members can greatly increase the confidence of persons opting to undergo HIV counseling and testing. This was one of the main facilitators expressed by the students and it is paramount that more health education campaigns focus on the youths to change their misconceptions about HCT so as to offer more support or motivation to those willing to undergo HCT. In many studies, individuals fear undergoing HCT because of a lack of support from partners or friends who may taunt or stigmatize their actions [41]. Health care-seeking behaviour is strengthened or influenced by close partners especially in the African context especially among students in particular. Students tend to follow the footstep of their friends or family members in health-related activities, hence their support or encouragement is paramount. The second facilitator that can motivate people to undergo HCT was having that positive feeling of being susceptible to HIV infection. Based on the Health Belief Model, people tend to change their behavior if they felt susceptible to disease. Therefore people must be knowledgeable about the modes of HIV transmission and be able to assess their actions and take the appropriate measures to change positively. Many studies revealed that people who feel less susceptible do not undergo HIV testing [42]. Therefore, it is crucial that we discourage individuals from that false belief of low suscepti-

bility or the belief that 'they are healthy' and do not need an HIV test. The best way to assess your behavior in terms of HIV infection is to go for HCT therein you will be assisted by a trained counselor to assess your actions. As young adults who are active and with strong immune systems coupled with little or good knowledge of HIV/AIDS, students would tend to believe that they do not exhibit the signs of HIV hence there is no need for testing. Many may regard testing as a waste of time bearing in mind that there is no cure for a positive test. Our study also revealed that HCT uptake can increase if personal and other people's concerns are addressed. The finding showed that when an individual values the importance of HCT, there is a likelihood that they will undergo HIV testing. The finding is supported by the health belief model which states that if individuals appreciate the benefits of a particular behaviour they tend to adopt interventions recommended to bring about the change. Therefore, individual concerns with regard to HCT in a positive manner can promote or influence HCT uptake among student nurses and midwives. Many of the students are far away from the family home and are considered mature enough to make their own decision hence family influence may not play a major role. This finding was also supported by results from a study conducted among university students in four African countries which showed that going for HCT was related to: general concerns, trust and support, and fears. Additionally, in the same study, 'Friends concerns' were also associated with the intention to go for an HIV test [43].

The fourth facilitator which is related to assured confidentiality, support and privacy is paramount in the utilization of HCT services among young people like student nurses. This finding is aligned with the results of a study conducted in Ghana which acknowledged the importance of privacy and confidentiality in HCT uptake [40]. In this same study, results showed that many clients and potential users of services were uncomfortable with the quality of care given by some health workers, especially as they overtly and covertly breached confidentiality about their client's health status. This has compelled many patients and potential users of the services to adopt a modus vivendi that provides them access to some care services while protecting their identity. Therefore maintaining confidentiality is key to increase in the uptake of HCT among student nurses and other cohorts.

The fifth facilitator related to HCT counseling and testing was about privacy and fear of knowing their HIV status. Lack of privacy and fear of knowing one's HIV status can be deterrents to HIV counseling and testing among nursing students and others alike. Therefore, adequate privacy should be accorded to clients during service delivery. The mere presence of a person at the HIV counselling centre or clinic is enough for the person to be labelled as or suspected to be HIV patient. It demonstrates that stigmatization may occur not only in the community but also overtly or covertly, in the health facility itself.

4.1 Practical implications of the study

The findings of this study have some practical implications and therefore imperative that government/stakeholders consider nursing students and midwives as major players/stakeholders in the fight against HIV/AIDS. Nurses are key service providers who have regular and prolonged contact with individuals affected and infected with HIV/AIDS compared to other healthcare workers. Thus, the role or relevance of this sector of the health force cannot be left out in any effective HIV/AIDS programs. Therefore, nursing students should be regarded as key partners in the fight against HIV and AIDS and when developing an effective education strategy. Our current study showed that those who utilized HCT services showed better knowledge and positive attitude toward HCT than those that did not. It is therefore recommended that all key players in the fight against HIV/AIDS should be encouraged to regularly undergo HCT. This will definitely make them confident to give advice to others to seek HCT services. The unimpressive level of HCT uptake and moderate attitude towards HCT is a call for concern. Therefore, there is a great need to embark on extensive HIV/AIDS educational programs so that nurses

can be agents of change. Despite the limitations, the study provides useful information on education and strategic planning for future HIV programs. The study also provides insight into the prevalence of HIV counseling and testing uptake among nursing students and midwives which is crucial for future strategic planning.

4.2 Limitations of this study

The present study has some shortcomings that should be noted when interpreting the results such as the close-ended responses of the self-administered questionnaire did not give an opportunity for respondents to express their opinions about other influencing factors associated with HCT. Also information provided by the respondents may be biased due to misunderstanding of questions or as a result of dishonest answering.

5. Conclusions

The uptake of HCT services among student nurses and midwives in The Gambia is associated with a number of socio-demographic factors such as age, sex, the academic year of study, wealth index and marital status (in **Table A1**). Our findings further demonstrated that there are multifactorial barriers and facilitators that can adversely hinder the uptake of HCT services among nursing students and midwives. Negative stereotypes from friends or partners, personal concerns and concerns about other people, privacy, perceived susceptibility, stigma and discrimination, and confidentiality are key barriers to HCT uptake. Despite the majority of the students undergoing HCT, the utilization rate was not impressive as expected from would-be nurses. Similarly, knowledge of HCT was not significantly high as expected. However, students showed a positive attitude toward HCT.

Based on the findings of the study, we recommend that health education programs specific to the benefits of HCT and other relevant topics that are being undertaken by different stakeholders in the fight against HIV/AIDS through drama and entertainment should be strengthened. Also, HIV/AIDS educational programs should be incorporated into school curricula so as to increase knowledge of HCT among students and clear misconceptions regarding HIV/AIDS and HCT. Furthermore, HCT services should be provided in nursing schools to improve access and thus limit the stigma and discrimination that may prevail in some health institutions.

Conflict of Interest

There is no conflict of interest.

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Appendix

Table A1. Socio-demographic factors associated with attitude towards HCT (n = 305).

Variable	N	Mean(SD)	Statistic value	*p*
Age			0.411**	0.663
19-24 years	177	113.61(±11.54)		
25-30 years	88	113.86(±13.653)		
31-50 years	40	115.55(±12.098)		
Gender			-0.33^	0.742
Female	186	113.75(±11.728)		
Male	119	114.23(±13.028)		
Family type			1.104^	0.271
Nuclear Family	157	114.69(±13.153)		
Extended Family	148	113.14(±11.162)		
Residence			0.885^	0.028*
Urban	174	115.27(±12.034)		
Rural	131	112.17(±12.315)		
Ethnicity			1.111**	0.355
Mandinka	125	113.24(±12.498)		
Fula	68	114.49(±11.475)		
Wollof	30	111.8(±14.414)		
Jola	36	118.19(±12.259)		
Manjago	14	116.5(±12.126)		
Sarahuli	7	107.29(±12.619)		
Serere	13	113.69(±7.398)		
Aku	7	111.71(±10.657)		
Foreigner	5	112(±10.954)		
Marital Status			3.543**	0.015*
Married	88	114.86(±12.381)		
Single	199	114.17(±11.842)		

Table A1 continued

Variable	N	Mean(SD)	Statistic value	*p*
In a relationship	13	103.38(±13.314)		
Divorced	5	115.8(±13.312)		
Year of Study			0.307**	0.820
3rd Year Class	42	113.88(±15.658)		
2nd Year Class	110	113.09(±11.909)		
1st Year Class	88	114.58(±8.907)		
Midwifery Class	65	114.54(±14.217)		
School			0.790**	0.455
RN School	133	112.94(±12.82)		
CHN School	97	114.62(±10.919)		
SEN School	75	114.83(±12.793)		
Parent alive			0.355**	0.786
One alive	108	114.51(±12.344)		
Yes	154	113.36(±12.558)		
Both alive	20	115.8(±9.266)		
Divorced	23	113.48(±12.176)		
Education father			1.380**	0.249
Tertiary	97	113.3(±13.718)		
None	145	113.73(±11.689)		
Primary	30	112.63(±9.357)		
Secondary	33	117.91(±11.977)		
Education Mother			0.502**	0.681
Tertiary	37	112.59(±15.179)		
None	176	113.78(±12.19)		
Primary	49	113.86(±11.079)		
Secondary	43	115.84(±10.987)		
Wealth index			1.225**	0.300
Middle	148	113.35(±11.795)		
Lowest	67	112.19(±12.828)		
Second	77	116.23(±11.343)		
Fourth	7	115(±12.138)		
Highest	6	117.17(±23.6)		
LGA			0.431**	0.882
Brikama	107	113.81(±12.709		
Kanifing	91	114.43(±11.611		
Kerewan	15	113.67(±14.171		
Basse	22	110.05(±15.126		
Janjanbureh	22	115.82(±12.006		
Banjul	18	115.06(±7.008		
Mansakonko	24	113.79(±13.012		
Kuntaur	6	114(±8.944		

^ = independent samples t-test, ** = one-way ANOVA, SD = standard deviation *statistical significance p-value < 0.05