ORIGINAL ARTICLE

Determinants of HIV Testing and Counseling Utilization among Trainee Nurses and Midwives in Central Region of Ghana

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ABSTRACT

Background: As an effective vaccine for HIV is yet to be developed, HIV testing and counseling (HTC) becomes a key cornerstone for the prevention and care strategies for HIV/AIDS pandemic both globally and in Ghana. This study examined the determinants of utilizing HTC among trainee nurses and midwives in the public nursing and midwifery training colleges in the Central Region of Ghana. **Methods:** A descriptive cross-sectional study design was employed to collect data from 375 nursing and midwifery students using multistage sampling procedures that comprised stratified random sampling and simple random sampling techniques. The binary logistic regression analysis shows that student nurses with positive attitude toward HTC were 3 times more likely to utilize HTC compared to those with negative attitude toward HTC (odds ratio [OR] = 3.25, 95% confidence interval [CI] = [1.02–10.41], $P \leq 0.05$). With sex, males were less likely to utilize HTC compared to females (OR = 0.42, 95% CI = [0.25–0.68], $P \leq 0.05$). Again, ages between18 and 20 were less likely to utilize HTC compared to those in other age categories (OR = 9.47, 95% CI = [2.15–41.72], $P \leq 0.05$). Regarding academic level, student nurses/midwives in level 300 were 2 times more likely to utilize HTC compared to level 200 counterparts (OR = 1.62, 95% CI = [1.03–2.53], $P \leq 0.05$). In addition, student nurses/midwives who were married 4 times more likely to utilize HTC (OR = 3.68, 95% CI = [1.14–11.90], $P \leq 0.05$) than their single colleagues. **Conclusion:** Student nurses/midwives decision to utilize HTC services is influenced by diverse factors. Trainee nurses/midwives' positive attitude toward HTC utilization is an expression of confidence in HTC services as a gateway for both primary and secondary prevention mode. This may increase in their ability to prescribe HTC services to clients in their future occupational settings. Findings provide more support for continual health education programs that promote positive attitudinal behaviors toward HTC, especially among males and singles who may ignore HTC services utilization.

Key words: Central region, Determinants, Ghana, HIV testing and counseling, student nurses and midwives, utilization

INTRODUCTION

Since an effective vaccine against HIV is yet to be developed, HIV testing and counseling (HTC) services remain cardinal in the prevention and care strategies[1] as knowledge of positive serostatus facilitates early referral for care and support as well as promote behavioral changes that reduce HIV transmission.[2] The United Nations General Assembly Special Session highlighted the pressing need for a scale-up or either develop HTC services.[3] The WHO issued

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overwhelming global declaration in support of HTC as a public health and developmental priority.[3] Although African governments thereafter adopted the concepts, the acceptance and utilization of the model by the citizens from the sub-Saharan region have been met with mixed attitudes.[3] Various research studies across the continent have attempted to find the level of HTC coverage and general acceptance of this prevention strategy. Results till date have been somehow low patronage, though, with high acceptance of its efficacy.[4,5]

HTC is considered a process or dialogue by which people seek HTC services to enable them make informed choices after learning about their status and taking appropriate actions.[4,6] For an individual to prevent, treat, or manage HIV/AIDS, health-seeking behaviors that protect, maintain, or promote health status must be exhibited.[7] These behaviors can be targeted at primary, secondary, or tertiary prevention stage.[6] Research literature[7-12] have shown considerable evidence that HTC is involved at all levels of HIV/AIDS prevention activities in the quest to curb the spread of the disease. Surprisingly, knowing the efficacy of HTC to HIV prevention has not been enough to influence people in the adoption of the protocol.[5]

One area that has been identified as a reason for decrease in the uptake of HIV testing and counseling among undiagnosed people is the barriers encountered at health-care provider level.[13] Besides, the necessity for clear and vivid protocols for HIV voluntary testing, counseling and treatment, knowledge, and attitudes toward acceptability of HTC to potential recipients and to the health professionals who must administer the services and the willingness of health professionals to provide care, manage, and treat HIV positive individuals are essential prerequisites.[14] For example, in a randomized controlled trial of pregnant women in Scotland, findings showed that even offering midwives with the same clear information and vivid protocols on how to administer the HIV test differed significantly among midwives in uptake rates, ranging from 15% to 48%.[15] Notably, midwives who doubted whether HTC services were useful for all women and whether services uptake should be promoted realized lower compliance rates.[16] The authors concluded that accessing HTC services are dependent more on the attitude of individual midwives than the method of offering the test and the time spent on pre-test counseling. Available scholarly information further shows that refraining attitudes against HIV/AIDS and HTC are very pervasive among health-care personnel[17] and pre-service nurses.[10,18,19] Findings from Tarwirei and Majoko[20] revealed that health workers were reluctant to have an HIV test, which inhibited their ability to initiate HTC services to clients. Therefore, nurses and midwives play a key role in the delivery of HTC services.[21] Pre-service nurses developing positive attitudes toward HTC might serve as positive role models in educating clients about HTC and HIV/AIDS services in their future occupational environment.[22,23]

Till date, studies have investigated specifically HTC services among different groups across other parts of sub-Saharan Africa (e.g., adolescents),[5,22,24-26] but little is known about the potential determinants influencing uptake of HTC services among trainee nurses/wives in Ghana. Diverse factors as varied as age,[22] religion,[27-29] gender,[5,22,30-33] and relationship status[28,29,34] have all been found to predict the utilization of HTC services. For instance, older age and female gender have been associated with HIV testing among ethnic diverse young adult populations.[35,36] Of these factors, gender was noted to be a particularly stronger contributor to testing status and 6 times higher among pregnant females than males.[36] While controlling for age and history of STI testing, the odds of self-reported HIV testing were nearly 3 times higher among females than males among sexually active African American adolescents.[36] Additionally, given that females and males differ in sexual compromising behaviors that lead to serious consequences such as HIV and other STIs, elements connected with HIV testing may also vary across gender.[37] Similarly, the uptake of HTC services is intricately related to individuals' marital and reproductive health status. For instance, marriage and parenthood characterize social duties, expectations, and a linkage with one's community. This status affects the uptake of HTC behavior in two contrasting ways. As an enabler, both men and women may seek HTC services as part of preparations for marriage. Persons who had never volunteered to HTC services may willingly seek the HIV management protocol when it was time to get married.[38-40] Religion as well as an important factor have been reported to influence the use of HTC services.[27-29] The potential positive avenues that religious beliefs and behavior can help promote human health, in general, and the spread of HIV/AIDS, in particular, is through the role of religious practices to promote personal health and safety.[41] For example, an investigation on the association between religion and contraceptive use, Addai[42] showed religion as a significant predictor of contraceptive use, with women who patronized liberal religious entities more likely to use contraception than women from conservative religious groups. Comparatively, Lagarde *et al*.[43] reported that Senegalese who affirmed religion as an important factor in their lives is less likely to report intention to be or actually having been faithful in protecting themselves from AIDS. These individuals, the authors concluded, were also less likely to feel at risk of getting HIV and subsequent utilization of its services.

Ghana has adopted a strategic framework as a cornerstone toward HIV control through easy accessibility to HIV testing, with introduction and implementation of varied programs to facilitate testing. Despite these attempts, HTC utilization is still low and somehow unfamiliar to many Ghanaians due to the fear of the testing outcome and HIV-related stigma.[29,31,32,44] Scale-up programs in HTC services in Ghana over the years have also yielded similar low utilization among the general population.[18,45] It is unclear if the factors that

impact the general population to voluntary test for HIV[23,44] may match up to HTC uptake among pre-service nurses and midwives' student. Research literature also suggests stigmatizing attitudes against HIV/AIDS and HTC issues among trainee nurses and midwives.[10,18,44] To date, only few studies[25,29,46] in Ghana have somewhat explored determinants influencing HTC uptake in the general population. However, little research has been done on potential future health-care providers (i.e., pre-service nurses and midwives). Nurses and Midwives serve as the largest deliverers of primary and secondary health-care worldwide. These health-care providers play a central role in clinical care of people living with HIV AIDS, and as such, must be adequately equipped in preparatory education.[47,48]

Therefore, a better understanding of the factors that hinder or promote HTC services by these potential future health-care providers is urgently needed. Thus, examining factors associated with HTC services among pre-service nurses and midwives are both epidemiologically essential as well as consistent with recent public health objectives aiming at HIV prevention and management among diverse populations. Swenson *et al*.[49] guided by the knowledge, attitude, and practice model,[50] a conceptual framework [Figure 1] that explains factors that influence individuals in adopting a desired healthy behavior (i.e., HTC utilization), the current study was designed to identify factors associated with HTC services among nursing and midwifery students in the Central Region of Ghana.

MATERIALS AND METHODS

Participants' selection criteria

Using a cross-sectional design, the study employed multistage sampling technique that incorporated stratified and simple random sampling procedures to obtain 375 study participants using Krejcie and Morgan[51] standardized table for determining sample size at a confidence level of 95%. This sample size was made up of 113 males and 262 females. The actual sample size from Krejcie and Morgan table was 341 but was increased by 10% to make room for non-returnability and non-completion of questionnaires. First, stratified random sampling technique was employed to put the colleges into strata. This was done to ensure that each stratum was represented according to its quantities in the population.[52] Second, simple random sampling technique was used to select the number of respondents needed from each college. This technique was used so that every member has an equal chance of being selected.[52] The selected students signed an informed consent form and were assured of anonymity and confidentiality at all stages of the data collection process. They were also made to understand that data collected were solely for academic reasons. Participants were subsequently told that their involvement was purely voluntary and that they could withdraw from the study process at any time they felt like doing so. Ethical clearance was obtained from the University of Cape Coast, Institutional Review Board [UCCIRB/CES/2017/11] and Dodowa Health Research Centre, Ghana Health Service [DHRCIRB/2017/11].

Instrumentation

A questionnaire segmented into A, B, C, and D; knowledge, attitude, and utilization of HTC services were used to collect data for the study. Variables' on the questionnaire were measured on nominal and Likert scale. Section A obtained data on respondents' demographic information such as sex, age, marital/relationship status, class level, and religious affiliation. Section B obtained data on respondents' knowledge on HTC services such as "HIV/AIDS testing and counseling is for everybody." For section C subscale, questions on attitudes toward HTC were drawn specifically on respondents' personal reactions toward HTC. Some of the items in this section were "I prefer to receive HTC services from health professionals" and "HTC does not predispose individuals to early sexual matters." For section D subscale, questions were specifically on whether respondents have ever used HTC services or not, and reasons for use and non-use were sought. The draft questionnaire was pre-tested among 50 nursing and midwifery students in the from Damongo Nursing and Midwifery Training College in the West Gonja District in the Northern Region of Ghana. The internal consistency measure for the binary variables subscale of the instrument was calculated using Kuder–Richardson [KR20] formula: $(\mathrm{KR}20 = \frac{K}{K-1}\frac{\left(1-\sum Pq\right)}{\sigma})$ and Cronbach's alpha for the continuous scale (4-point Likert scale). The KR20 yielded 0.62 and 0.75 reliability for the pilot and main study, respectively, while the Cronbach's alpha yielded 0.65 and 0.80 reliability coefficient for the section C subscale in the pilot and main study, respectively. The KR-20 was chosen for the nominal variables because it is a reliability measure suitable for binary variables. The scores for KR-20 ranged from 0 to 1, where 0 is no reliability and 1 is perfect reliability.[53]

Definition of key variables

The dependent variable employed for this study was ever had HTC. This variable was coded 0= "No" and 1 = "Yes." The main independent variables used were knowledge on HTC and attitude toward HTC. Knowledge of HTC was categorized into low, moderate, and high knowledge.[5] Since there were 11 items measuring knowledge on HTC, respondents with 0–3 items correct which represents 0–39% were considered to have low knowledge, those with 4–7 items correct, representing 40–79% were considered to have moderate knowledge, and those who answered 8–11 items correctly, representing 80–100% were considered to have high knowledge. Data on attitude toward HTC were obtained on 10 items measured on a 4-point Likert scale. The positive statements were measured as follows: Strongly disagree (1), disagree (2), agree (3), and strongly agree (4). The negative

statements were measured with a reversed score of strongly disagree (4), disagree (3), agree (2), and strongly agree (1). The data on the variable were categorized into positive attitude defined with a score of 26–40 and negative attitude defined with a score of 10–25. In addition, five sociodemographic variables; sex, age, level, marital status, and religion were used for the study.

Procedure

The questionnaire was administered by the researchers after an initial permission was sought from the authorities. Rapport was established with Principals and research tutors in the colleges and student leaders on arranged dates and time for the data collection. Students were contacted before a social gathering (i.e., an all-inclusive public access) organized by their respective institutions. An introductory session was arranged to brief participants on the purpose of the study and the standard instructions needed for completion of the questionnaire. Those who voluntarily agreed to participate in the study signed a consent form and were able to complete the questionnaire with minimal assistance. Three hundred and seventy-five questionnaires were retrieved, yielding a 100% return rate. The data collection process lasted 3 weeks.

Data analysis

Pre-screening data were manually conducted to check on completeness of the responses and statistical screening was done to check for missing values. Data were cleaned and entered into SPSS version 21 for analysis. Bivariate analysis using Chi-square test of independence was initially performed between each of the independent variables and the dependent variable (ever had HTC), to identify the independent variables that showed statistically association with the dependent variable. The independent variables that showed statistically significant association with the dependent variable at $P \leq 0.05$ were further put in a multiple logistic regression model to show their relative influence on the dependent variable. Odds ratio (OR) at 95% confidence intervals (CI) and *P* values were obtained for significant variables in the bivariate analysis. The dichotomous nature of the dependent variable influenced the choice of a multiple logistic regression for data analysis.[53]

RESULTS

Bivariate analysis on HTC utilization

Table 1 shows the results of a bivariate analysis of the factors that influence utilization of HTC. In the bivariate analysis, five of the independent variables (attitude towards HTC, sex, age, level, and marital status) had statistically significant association with utilization of HTC. In relation to attitude toward HTC, 78.9% of student nurses with positive attitude toward HTC utilized it. With sex, males recorded the highest utilization of HTC (68.1%). Student nurses aged 18–20 had the highest proportion in relation to the utilization of HTC (81.5%). Furthermore, level 200 student nurses and midwives recorded the highest proportion of HTC utilization (63.6%). Student nurses who were single had the highest percentage of HTC utilization (56.7%). From the Chi-square analysis, attitude toward HTC ($\chi^2 = 5.382$, $P < 0.05$), sex ($\chi^2 = 14.758$, $P < 0.05$), age ($\chi^2 = 13.185$, $P < 0.05$), academic level ($\chi^2 = 14.263$, $P < 0.05$), and marital status ($\chi^2 = 8.028$, $P < 0.05$) showed statistically significant relationship with utilization of HTC.

Multivariate analysis on HTC utilization

In the multivariate analysis, all the five independent variables (attitude toward HTC, sex, age, level, and marital status) showed statistically significant influence on HTC utilization at 95% CI. The full model containing all the predictors was statistically significant (χ^2 [8, $n = 375$] = 49.132, $P < 0.05$), indicating that the model was able to distinguish between respondents who utilized and those who did not utilize HTC. The model as a whole, explained between 12% (Cox and Snell R^2) and 16% (Nagelkerke R^2) of the variance in utilization of HTC [Table 2].

Comparison of the determinants of HTC utilization among the respondents shows that student nurses/midwives with positive attitude toward HTC were 3 times more likely to utilize HTC compared to those with negative attitude toward HTC (OR = 3.25, 95% CI = [1.02–10.41], $P \leq 0.05$). With sex, males were less likely to utilize HTC compared to females (OR = 0.42, 95% CI = [0.25–0.68], $P \leq 0.05$). Again, with age, pre-service trainees aged 21–23 years were 5 times more likely to utilize HTC compared to those aged 18–20 years (OR = 5.09, 95% CI = [1.67–15.55], $P \leq 0.05$), those aged 24–26 years were about 7 times more likely to utilize HTC compared to those aged 18–20 years (OR = 6.77, 95% CI = [2.14–21.47], $P \leq 0.05$), and those aged 27–29 years were 9 times more likely to utilize HTC compared to those aged 18–20 years (OR = 9.47, 95% CI = [2.15–41.72], $P \leq 0.05$). With respect to academic status, level 300 student nurses were about 2 times more likely to utilize HTC compared to level 200 student nurses/midwives (OR = 1.62, 95% CI = [1.03–2.53], $P \leq 0.05$). Compared to student nurses/midwives who were single, those who were married were about 4 times more likely to utilize HTC (OR = 3.68, 95% CI = [1.14–11.90], $P \leq 0.05$).

DISCUSSION

The principal focus of this study was to ascertain the determinants that influence the utilization of HTC services among student nurses and midwives in the nursing and midwifery training colleges in the Central Region of Ghana. Our findings show that student nurses and midwives with positive attitude toward HTC were more likely to utilize HTC services compared to those who showed negative attitude toward HTC services. This finding is consistent with other

Table 1: Bivariate analysis of determinants of HTC utilization

Variables	Yes (%)	No (%)	Chi-square(χ^2)	*P*-value (95% CI)
Knowledge of HTC			0.632	0.427
Moderate	48.3	51.7		
High	53.9	46.1		
Attitude toward HTC			5.382	0.020*
Negative	51.7	48.3		
Positive	78.9	21.1		
Sex			14.758	0.000*
Female	46.6	53.4		
Male	68.1	31.9		
Age			13.185	0.004*
18–20	81.5	18.5		
21–23	54.3	45.7		
24–26	47.5	52.5		
27–29	33.3	66.7		
Level			14.263	0.000*
Level 200	63.6	36.4		
Level 300	44.1	55.9		
Marital status			8.028	0.018*
Single	56.7	43.3		
Married	25.0	75.0		
Have a boyfriend/girlfriend	50.0	50.0		
Religion			1.574	0.455
Christian	52.2	47.8		
Muslim	65.2	34.8		
Others	60.0	40.0		

*Significant results; *P*<0.05. HTC: HIV testing and counseling, CI: Confidence interval

studies[54,55] which found HTC uptake to be higher among health-care providers who displayed a positive attitude toward HTC than those who exhibited a negative attitude. For example, findings from Muewa[54] revealed that health-care providers in the Eastern Province of Kenya who had positive attitude toward HTC utilized HTC. Contrarily, the likely positive attitude to HTC utilization found in the present study contradicts other research findings.[5,56] Perhaps, some methodological limitations.

may account for these inconsistencies. For instance, the academic level of the participants in Pikard's[56] study was high school students below the academic level of the participants in the present study, though, the variables measured and the youthful characteristics of Pikard's respondents resonate with that of the current study. Displaying positive attitude toward HTC utilization could mean that individuals understand their susceptibility to HIV/AIDS and hence may see the need to undergo HTC as a preventive tool for reducing the risk for HIV/AIDS. The somewhat negative attitude toward HTC shown by a section of the pre-service nurses/midwives suggests the unwillingness of these students to take HIV test due to perhaps fear, anxiety, and stigma as well as discrimination associated with HTC, respectively. Available literature suggests that young adults have been found to be less likely to engage in preventive behaviors due to the fear of HTC stigma.[57,58] Similarly, the fear of social exclusion and sexual partners[59-62] may negatively influence uptake of HTC services.[60,61,63-67]

The variable sex did influence HTC utilization in the current study. Specifically, males were less likely to utilize HTC services compared to the females. This finding is congruent with findings from other studies.[5,29,54] The utilization of HTC services among females as realized in most studies in Ghana including the present study could be due to the ongoing mandatory prevention of mother-to-child transmission strategies during antenatal services in Ghana where every pregnant female who reports to the health facilities is tested for HIV/AIDS as a protocol of the policy. This routine HTC

Table 2: Multivariate analysis of determinants of HTC utilization

Variables	Yes	No	B	Wald	OR (CI)	*P*-value
Attitude toward HTC						
Negative	51.7	48.3			Ref	
Positive	78.9	21.1	1.179	3.951	3.25 (1.02–10.41)	0.047*
Sex						
Female	46.6	53.4			Ref	
Male	68.1	31.9	−0.877	12.159	0.42 (0.25–0.68)	0.000*
Age						
18–20	81.5	18.5			Ref	
21–23	54.3	45.7	1.627	8.145	5.09 (1.67–15.55)	0.004*
24–26	47.5	52.5	1.913	10.553	6.77 (2.14–21.47)	0.001*
27–29	33.3	66.7	2.248	8.836	9.47 (2.15–41.72)	0.003*
Level						
Level 200	63.6	36.4			Ref	
Level 300	44.1	55.9	0.481	4.432	1.62 (1.03–2.53)	0.035*
Marital status						
Single	56.7	43.3			Ref	
Married	25.0	75.0	1.303	4.738	3.68 (1.14–11.90)	0.029*
Have a boyfriend/girlfriend	50.0	50.0	0.089	0.130	1.09 (0.67–1.77)	0.718
Pseudo R^2	0.12–0.16					
χ^2	49.132					
P-value	0.000					

*Significant results. HTC: HIV testing and counseling, CI: Confidence interval, OR: Odds ratio

services might be the reason for more females accessing HTC compared to males. It must be recognized that outside prenatal programs, women less frequently access HTC than males.[68] To deal with the disparity, there is the need to design strategies that will give males the opportunity to routinely test for their HIV status to improve HTC utilization. In addition, gendered power or power distance associations also challenge uptake of HTC. For many sub-Sahara nations (e.g., Ghana, Nigeria, Tanzania, South Africa, Kenya, and Uganda), the sole authority, power, and responsibility of healthcare-seeking behaviors rest with men.[69,70] Men may refuse to engage in HTC services because this was at cultural odds with masculine identity of self-confidence, resilience, hardiness, and stoicism.[59,62] In most typical African homes, if the wife suggested HTC services, this may be regarded by men as undermining their role as decision makers.[60] As primary caregivers, women restrictive role in decision-making on diverse household matters (including HTC and other reproductive health issues) serves as enabling factor toward access to reproductive health-care services compared to men.

Other findings show that HTC utilization increases with increasing years. This assertion can be observed in the results where 21–24 years' respondents were 5 times more likely to use HTC, 24–26 years were 6 times more likely, and 27–29 years' respondents were 9 times more likely to utilize HTC services, thus showing a progressive linear relationship between age and HTC utilization. The reason for the increasing age and HTC utilization could be because as respondents grow in age (i.e., maturation), they enter into conjugal relationships that may predispose them or their partners to certain conditions that may raise their perceived susceptibility and vulnerability to HIV and other sexually transmitted diseases. Respondents may, therefore, be encouraged to utilize HTC as a primary preventive tool. This finding implies that student's nurses and midwives at lower age categories may consider themselves less vulnerable to HIV/AIDS, hence, their apathy toward HTC services.

In the current study, educational level of pre-service nurses and midwives was associated with HTC utilization. Level 300 student nurses and midwives were 2 times more likely to undergo HTC services compared to level 200 counterparts. These findings suggest that the higher the educational level of respondents, the more likely that they will use HTC services. This finding corroborates with Addis *et al*.[28] which predicates that education in years is linearly associated with the use of HTC services. The influence observed could mean that students who are in school for a considerable time and

at a higher level are more exposed to curricular and clinical health delivery processes including HTC than those at lower level of the educational ladder. We, therefore, infer that the higher a person's level of education and exposure to HTC issues, the more likely the person decision to utilize HTC services. In addition, marital/relationship status was also found to be associated with HTC services utilization. Respondents who were married were 4 times more likely to have utilized HTC services, a finding which is corroborated in other studies.[29,34] Across some parts of sub-Saharan Africa, the fear of ruining marital relationships including likelihood of potential abandonment or separation, divorce, and/or even violence[71-74] may constrain or facilitate the uptake of HTC services. The quest to marry may also play heavily on people's mind and the likelihood of a positive or negative serostatus would threaten or enhance the odds of discovering a marriage partner.[62,74-76] For instance, in Uganda, anytime discordance arose between marital partners, HIV test was used as confirmation of infidelity. As a result of this procedure, marital relationships are strained afterward.[77,78]

Practical implications

The attitude of an individual health-care provider with respect to the offer of HTC services may prove to be a significant gateway for clients' who may consider HTC utilization. Nonetheless, some nurses/midwives, particularly as primary caregivers, may even be reluctant to help address HIV. The effort to increase the access and utilization of HTC services means that pre-service nurses/midwives should be trained to be more proactive and show confidence in facilitating HTC services toward early diagnosis, an essential element for appropriate treatment and prevention. Till date, intervention studies have proven the effect of provider-client interactions on the HTC utilization. For instance, client's responses are masked by providers' background characteristics (i.e., sex, age, marital status, and educational level) and attitudes and these elements would determine the extent to which care providers are trusted by their clients. Available literature claims that acceptance of HTC increases substantially after it was regularly offered by care providers who displayed positive attitudes within postpartum wards in Botswana, pediatric wards in Zambia, tuberculosis clinics in Congo, and Ugandan pediatric wards, maternity wards, and STI clinics.[79-84] Although these examples are context specific and cannot be generalized across many African societies, definite clues could be taken to boost HTC services within the geographical location where the current study was conducted. This approach would enhance motivation and expression of confidence in the HTC protocol for primary prevention, care, and management of HIV/AIDS. For pre-service professional nurses/midwives, acting as role models or ambassadors of HTC services may intrinsically motivate clients toward accessing this management protocol for HIV/AIDS.[57] The current curriculum of the pre-service nurses should act as modifying agent that should help students to be more and better exposed to theoretical and practical related experiences that better affect their decision to utilize HTC services. The age and marital status of pre-service nurses/midwives are also critical in defining whether a trainee may utilize HTC services and would be willing to use this management protocol in the future.

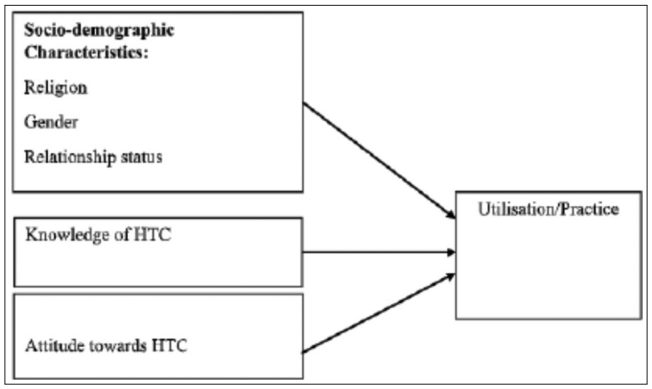

Figure 1: Adapted (Muleme, Kankya, Ssempebwa, Mazeri, and Muwonge, 2017) knowledge, attitude, and practice model for the study

Limitations

The present study has shortcomings that should be noted when interpreting the results. Using a cross-sectional design, the potential causal inference of the results cannot be ascertained. The close-ended response structure of the developed questionnaire did not give opportunity for respondents to express their opinions, hence, may have limited study participants on the expression of their opinions on relevant issues. Questionnaire, therefore, lacks the power to identify all errors despite checking its construct and content validity by experts. Sensitive issues like HIV/AIDS may trigger social desirability concerns such as underreporting or over-reporting, self-presentation, recall biases, and confidentiality worries due to potential stigmatization connected with a reported behavior.[85] These concerns were reduced by ensuring complete anonymity of study participants during the research.

CONCLUSION

The uptake of HTC services among pre-service nurses/midwives in the Central Region of Ghana is predicted by an array of often intertwined sociodemographic factors (attitude, sex, age, and marital/relationship status). Despite the heterogeneity of our sample, our findings show a strong similarity in the factors (i.e., barriers and facilitators) associated with HTC uptake across other parts of the country and in some parts of the sub-Saharan region. More research will be crucial to investigate whether health-care providers are willing and sufficiently prepared to implement and emphasize health-care provider-initiated HTC services. Whether clients who undertake HTC services initiated by a

health-care provider are as prepared as those who actively engage in HTC services remains to seen. It would be interesting to ascertain through further studies the impact health-care provider-initiated HTC services may have on other HIV management and support-related services as well as their effectiveness. To facilitate sustainable HTC utilization among pre-service nurses/midwives, HTC programs should improve access as well as address stigmatization, anonymity, and confidentiality HTC-related matters. For example, skill-based training for HIV preventive behaviors and routine interaction between relationship partners about HTC may serve as a conduit toward bridging the gap between weird beliefs about HIV and health behaviors. This approach would offer better HIV test seeking and test acceptance among pre-service nurses and midwives and future clients.

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