

Uptake of HIV Testing and Counselling among the Youth in Kintampo South District, Ghana

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Abstract

Background

HIV/AIDS remains a threat to global development and human security. Sub-Saharan Africa is the worst affected, with an estimated 25.7 million people living with HIV as at 2018 and the youth accounting for 33% of new infections. Despite the high proportion, there is paucity of data on testing and counselling among the youth and which factors influence their decision are largely unknown. This study assessed factors influencing uptake of HIV testing and counselling among the youth aged 15 to 24 years in Kintampo South District in Ghana.

Methods

This was a cross-sectional study involving the youth who have lived in the Kintampo South District for not less than 6 months. A total of 309 respondents aged 15 to 24 years were drawn from four sub-districts of the six administrative sub-districts by simple random sampling. Simple proportions and logistic regression analyses were performed to elucidate factors influencing uptake of HIV testing and counselling. The level of acceptable statistical significance used was $p < 0.05$.

Results

Overall, the proportion of the youth 15 to 24 years who ever tested for HIV was 50.2%. Lack of confidentiality and privacy, inconvenient facility opening hours, fear of positive results, and perceived poor attitude and mistrust of health service providers reportedly were the main barriers to uptake of HIV testing and counselling. Further logistic regression analyses showed that demographic factors including age, marital status and occupation as well as ever heard of HIV testing and counselling, convenience of test, willingness to test, importance of test and location of test, were key determinants of HIV testing and counselling.

Conclusion

Giving that about half of the respondents had never had a test and did not know their infection status, has serious implications for HIV control in the Kintampo South District. Even though a significant number of the youth showed interest in knowing their infection status, this did not reflect uptake of HIV testing. Public health effort targeted to the youth should be intensified to increase HIV testing and counselling among the youth in the Kintampo South District.

Plain English Summary

HIV attacks the body's defence mechanism and causes serious ill-health (HIV/AIDS) and death if not detected early enough and treated. HIV/AIDS affects the quality of life of persons affected. Its impact is felt mostly in the Sub-Saharan African countries including Ghana. This study aimed to identify factors that influence the decision of youths (aged 15 to 24 years) in Kintampo South District, Ghana, to get tested for HIV and seek counselling. A total of 309 young people were interviewed using structured questionnaire. The results showed low uptake of HIV testing and counselling in the District. Almost half of the youth had never tested for HIV and did not know their infection status. Factors shown to be associated with uptake of HIV testing and counselling in the study included: (1) mistrust of health systems, (2) lack of courage to do the test(1), educational status, (4) poor attitude of some health personnel and (5) unavailability of testing centres. In conclusion, the study suggests that community outreach programmes should be organized to create awareness on the need to get the youth to test for HIV/AIDS. Government must revise existing strategies in an effort to promote HIV testing and provide special training for health professionals.

Background

HIV/AIDS remains a serious threat, globally, affecting all ages, with an estimated 35 million cumulative deaths and 38 million people currently living with the infection (1). The number living with the infection in 2015 was estimated to be 36.7 million people of which sub-Saharan Africa (SSA) accounted for 25.5 million (2). By the end of 2018, an estimated 37.9 million people were believed to be living with HIV and around 6,000 young women aged 15 to 24 years were infected every week (1, 3). Over fifty percent of all global HIV cases are among young people aged 10 to 24 years (4). In sub-Saharan Africa (SSA), 4 in 5 new infections among adolescents aged 15 to 19 years are in girls whereas young women aged 15 to 24 years are twice as likely to be living with HIV than young men of the same age group (5). An estimated 1.8 million new infections were reported in 2016 with about two-thirds from SSA and about one-third occurring among young people 15 to 24 years (5).

Worryingly, over half of the people living with HIV do not know their infection status (6). Meanwhile, there is an increasing proportion of the infection among adolescents and young adults, with over a third of all new infections from this age group in SSA (7). Disturbingly, the high proportion of HIV infection among the youth is not in keeping with their uptake of testing. In fact, only 10% of males and 15% females aged 15 to 24 years get tested and know their HIV status (8). Therefore, a large majority remain reservoir and high risk of transmitting the infection to their peers (8). The cumulative effect of HIV is substantial, ranging from stigmatization, acute and chronic ill-health and HIV/AIDS-related deaths as well as the socio-economic burden on the household, community and the country (4, 5). Although the annual number of AIDS-related deaths worldwide dropped by 35% between 2005 and 2013, deaths among adolescents (ages 10 to 19) increased by 50% during the same period (7, 9).

Sub-Saharan Africa forms only 12% of the global population and yet accounts for over half of the burden of HIV infection (7). In SSA, where most adolescents and adults living with HIV reside, only 1 in 5 HIV-positive adolescent girls know their HIV status. Moreover, globally, an estimated one-third of all new HIV

infections occur in those aged 15 to 24 years (8). This demonstrates the importance of an HIV response and testing targeting these age groups (10). In 2015, 250,000 adolescents and young adults living with HIV were newly infected and 2 out of 3 of these new infections resided in SSA. The increased incidence of HIV with growing population and limited access to uptake of testing and counselling services will inevitably lead to substantial HIV burden in the years ahead (11). A recent systematic review reported that approaches evaluating uptake and positivity rate of HIV testing services had not been tailored to the needs of persons aged 5 to 19 years. Specific barriers adolescents, in particular, face have not been well integrated within the regular service delivery (12).

Despite the staggering statistics, a very low proportion of young men and young women in SSA know their HIV status (12). Barriers to HIV testing include lack of awareness of available services (13), perceived low personal risk (14), fear of a positive test result (including associated negative consequences and stigma) (15), concerns about confidentiality (15), costs of testing and lack of sufficient knowledge about HIV/AIDS (14). The current trend and dynamics of HIV infection in SSA, particularly among young people living with the infection but who remain undiagnosed paints a gloomy picture on the outlook of HIV prevention and control in SSA.

In spite of the burden of HIV/AIDS in adolescents and young adults, little has been devoted to the promotion of HIV testing, counselling, and linkage with appropriate care among this special population (16). Although there is availability of effective antiretroviral therapy globally, the impact of chemotherapy may not fully be realized if effort is not strengthened to increase uptake of HIV testing and counselling among the youth. Undoubtedly, HIV testing and counselling has the potential to improve early detection, prompt linkage to appropriate intervention, improved treatment outcomes, and reduction in new infections. It is particularly necessary to engage young people in sub-Saharan Africa to identify and address challenges affecting access to HIV counselling and testing. Such understanding may also inform future research, practice, and policy regarding interventions that address young people's unique barriers to HIV testing and counselling.

In Ghana, particularly, the Bono East Region, there is hardly any study that has investigated HIV testing and counselling to provide the evidence base for policies to address the low uptake. This study assessed factors associated with HIV testing and counselling uptake among the youth with the goal of generating evidence that will inform contextualized control intervention options to improve early detection, prompt treatment and the ultimate reduction in the number of deaths from HIV/AIDS among the youth.

Methods

Study design, area and population

This was a cross-sectional study conducted in 2016 among the youth 15 to 24 years who had lived in the Kintampo South District for at least 6 months and consented to participate in the study. For those below 18 years, a parent/guardian had to sign an assent form for their participation. The six-month criterion

was used to rule out the potential of including visitors who were temporarily living in the district. Any of the youth meeting the eligibility criteria but who could not respond to the interview due to physical or mental ill-health were excluded from the study. This population was targeted due to the perceived high risk of HIV infection among them and their high affinity for risky sexual behaviours. Also, a review of HIV data from the district health directorate reflected low uptake of HIV testing and counselling among this population despite the high risk of infection among the age group. The district health directorate had inadequate information regarding the reasons for the low uptake of HIV testing and counselling and that makes it difficult to design public health interventions to improve uptake of testing and counselling among the youth. The study was conducted to ascertain factors that affect uptake of testing and counselling for HIV among the youth so that recommendations are implemented to improve uptake.

The Kintampo South District, with Jema as its capital, was created in 2004 and had a total population of 97,716 according to 2019 composite budget of the Ministry of Finance and Economic Planning (17). It lies south of Kintampo North Municipal and Techiman North District, West of the Wenchi District, and East of Nkoranza North District. Most of the inhabitants are peasant farmers with over 80% living in rural areas. The population is youthful with more than 42% aged below 15 years. The District is on the main highway between Techiman and Burkina Faso where people travel throughout the day and night. Jema then mostly serves as a transit point for heavy truck drivers travelling to the Northern part of Ghana and Burkina Faso. The activities of travelers have led to increased risk and transmission of HIV. Most of the young people in the district are poor and depend on their parents, relatives or friends for livelihood and can, therefore, easily be lured by money and gifts into engaging in sexual activities (mostly unprotected sex) with men in transit. The high poverty among the youth, particularly girls, also triggers the potential for them to exchange sex for financial support. This increases the potential for HIV infection and subsequent transmission to their peers in the community. In spite of this, uptake of HIV testing and counselling in the district is very low raising serious concerns.

Sample size determination

The determination of the sample size for the study took into consideration the proportion of estimated uptake of HIV testing and counselling among the youth in Ghana from previous studies. The estimated proportion of the youth that ever tested for HIV in Ghana as reported in the GDHS (15) was 24%. Data on a similar study targeting the youth 15 to 24 years in the Kintampo South District was not available so we used the above proportion for determining the size of the sample to be included in this study (15). Aiming for a precision of $\pm 5\%$ for a proportion of 24% using a 95% confidence interval, a sample size of 281 respondents was required and 309 were needed in order to anticipate a 10% level of non-response, since the study respondents involved some late adolescents who may not be comfortable answering questions related to their sexual lifestyle. Finally, a sample of 309 youth aged 15 to 24 years was used for the study.

Sampling

The study employed a multi-stage sampling technique where sub-districts were selected from the district and from the list of sub-districts, communities were randomly selected. The district has six operational sub-districts in the administrative structure. A simple random sampling technique without replacement was used to select three sub-districts namely, Apesika, Anyima and Amoma sub-districts out of the total six. One sub-district (Jema sub-district) was purposively selected. The reason for including Jema sub-district was because of the high population of the target study group residing there either for educational reasons or for economic opportunities.

From the list of sub-districts randomly selected, four communities were further randomly selected. The unit of study was households in the selected communities with youth 15 to 24 years. The Jema community was again purposively selected for the study giving the high population of the youth there. In each community, the house numbers were obtained, written on pieces of paper, folded and shuffled in an opaque envelope. The house numbers that were drawn from the envelope by simple random sampling were included in the study. Where there was more than one eligible respondent in a household, one was selected by a simple random sampling technique of writing "yes" and "no" on pieces of paper, then folded and asked them to pick. The one who picked yes was included in the study and interviewed. The households visited were serially numbered to avoid duplication of study respondents. The first household in each community was numbered as H/001 and the second household numbered H/002 until the size of the sample was reached. Apart from Jema where 99 respondents were interviewed, 70 respondents were interviewed from the other three communities.

Data Collection

A structured and pre-tested questionnaire was used to collect data through a face-to-face interview. The questionnaire was constructed using both open-ended and close-ended questions. The reason for employing face-to-face interviews was due to the high illiteracy rate among the youth in the study communities. The questions in the interview guide were constructed to reflect the variables of the study. The questions covered demographic characteristics of respondents such as age, sex, educational status, marital status and respondents' knowledge regarding HIV testing and counselling, and factors that influence testing and counselling uptake. The questions were constructed in English and translated into Twi which is the most spoken language in the study area. The tool was earlier pretested among 20 eligible youth of similar attributes as the main study participants in the Kintampo North Municipality and some few ambiguities corrected to ensure that accurate response from respondents. Training was organized for data collectors before data collection started.

Data management and analysis

The data were double entered, and copies were saved in different computers. Errors and duplications were removed which were independently verified by another author. The questionnaires were kept under key and lock in a fireproof cabinet. The dependent variable for the analysis was 'ever tested for HIV' and

the independent variables were demographic characteristics, location of HIV testing and counselling services, sources of HIV testing and counselling information, convenience of HIV testing and counselling services and willingness to test for HIV. Age was used both as categorical and continuous variable for estimating odds ratio and their confidence intervals (CIs) and p-values. For continuous variables, the mean and their standard deviation were presented. The screened data were coded and statistically analyzed using Stata Software Version 13. Hard copies of the questionnaires were consulted whenever a discrepancy was identified during the analysis. Descriptive statistics were performed, and the results were presented as frequencies and percentages in tables and figures. Univariate analysis was first conducted on all the variables including age, sex, educational and marital status to establish how each of them independently influences uptake of HIV testing and counselling. The statistical significance for the study was set at $p \leq 0.05$. Only variables with statistical significance of $p \leq 0.05$ were included in the multivariate regression model for further analysis and the results were presented as Odds ratio with their 95% CIs.

Ethical consideration

Ethical approval was sought from the Ghana Health Service Ethical Review Committee before the commencement of the study (Reference number: GHS-ERC 50/12/15). All methods were carried out in accordance with relevant guidelines and regulations. Permission was also sought from the Kintampo South District Director of Health Services as well as leaders of the communities where the study was conducted. The interview was conducted as face-to-face interviews in an environment that was devoid of distraction and provided privacy for the participants. The objectives of the study were explicitly explained to each respondent and their informed consent sought before they answered the questions. Only respondents who consented to participate in the study were given a consent form to sign/thumbprint before they were interviewed.

For participants below 18 years, an assent form was provided for their parents/guardians to consent by signing/thumb printing before they were interviewed. Participants were also made to understand that participation in the study was voluntary and that every participant had the right to withdraw at any time during the study. Confidentiality of data collected was ensured by using identifiers rather than names of participants and the participants were equally assured that the data collected will only be used for academic purposes. The participants were equally assured of the safety and confidentiality of the information collected by ensuring that it would be stored in an electronic format on different personal computers and as hard copies under key and lock in fire-proof cabinets. Apart from those involved in this study such as the data collectors and supervisor, no other party was given access to the data collected.

The study involved only the administration of questionnaires with no risk to the participants. Therefore, no compensation package was given to the participants. The administration of the questionnaire lasted about 30 minutes per participant and they were told before the start of each interview session. Participants in the study were not provided with any material benefits from the study, however, their

participation in the study helped them acquire some understanding of HIV infection and its transmission, the benefits of testing and knowing their HIV status, and where to get tested for HIV in the district and beyond.

Results

The study achieved a 100% response rate with all the 309 respondents consenting and responding to questions asked during the interview. The mean (\pm standard deviation) age of respondents was 20.7 ± 0.15 years (Table 1). Half of the respondents were females (50.8%), single (83.2%) and in the 21 to 24 age group (57.2%). Overall, 49.3% of the respondents had never checked their HIV status and hence did not know whether they had the infection or not. Factors influencing the decision of the youth 15 to 24 years to test for HIV and know their status have been presented in Table 2. Various reasons were reported as barriers to HIV testing and counseling among the youth and these included fears of stigmatization (24%), fear of discrimination (21.4%), fear of positive test results (30%) and self-trust (19.1%). From the univariate analysis, the decision to have an HIV test among the youth was statistically significantly influenced by whether they knew about HIV testing and counselling [OR = 0.15 (95% CI: 0.07 to 0.03); $p = 0.001$] and where to go for the test [OR = 0.98 (95% CI: 0.97 to 0.98); $p = 0.001$]. Other factors that showed statistically significant influence on HIV testing and counselling included test as a requirement for marriage certification and fear of contracting HIV infection (Table 3). The univariate logistic regression model The study also showed that young people were more likely to accept HIV testing and counselling when they got the information about these services from their friends than other sources [OR = 0.28 (95% CI: 0.12 to 0.65); $p = 0.003$], respondents aged 21 to 24 years were more than twice likely to utilize HIV testing and counselling than those less than 21 years [OR = 2.48 (95% CI: 1.37 to 4.49); $p = 0.003$], professionals (gainfully employed in the government/private sector) were more than 10 times likely to utilize HIV testing and counselling services [OR=11.84 (95% CI: 3.49 to 40.16); $p = 0.001$] and those who were married showed more than 4 times increased Odds of utilizing HIV testing and counselling services [OR = 4.19 (95% CI: 1.92 to 9.13); $p = 0.001$]. Only variables that showed statistical significance at $p \leq 0.05$ in the univariate analysis were included in the multivariate logistic regression model and the results showed that only willingness to test for HIV significantly influence improved uptake of HIV testing and counselling [OR = 1.11 (95% CI: 1.06 to 1.15); $p = 0.001$] (Table 4). Age of respondent, marital status, occupation, ever hear about HIV testing and counselling, convenience of test, willingness to test, importance placed on testing and counselling and location of testing and counselling services no longer showed statistically significant effect of uptake of HIV testing and counselling (Table 4).

Discussion

The study sought to assess the factors influencing uptake of HIV testing and counselling among the youth aged 15 to 24 years in the Kintampo South District and showed interesting findings which have significant implications for HIV/AIDS control.

Demographic characteristics of respondents

The results showed that being 21 years or older increased the Odds of testing for HIV compared to those aged 15 to 20 years. Another study in Canada and UK (18) on factors affecting HIV testing and counselling services among heterosexuals in Canada and the United Kingdom reported that age was the most frequently mentioned socio-demographic factor associated with HIV testing and counselling. This finding was consistent with a similar study conducted in Uganda on the proportion and correlates of HIV testing among adolescent (19), reported that older adolescents aged 15 to 19 years had higher odds of HIV testing largely because older adolescents have more autonomy and decision making responsibilities including health seeking. They are also more likely to be sexually active and in the marriage age who need to have a test done as a requirement for marriage by most religious institutions in Ghana (20). Therefore, HIV testing strategies should be designed considering the different age distributions in the population and their needs when implementing activities to improve HIV testing and counselling.

The proportion of males to females who ever tested for HIV in the study was 49% and 51% respectively. In a study in South Africa (21) and Burkina Faso (22), females consistently tested higher than males in the population. In contrast to our study findings, Djan reported more males tested for HIV compared to females (23). However, Djan's study was done in the Techiman Municipality (which shares borders with this study area) demonstrating that various determinants may influence uptake of HIV testing and counselling in different parts of Ghana. The study found religion as not directly having significant influence on HIV testing and counselling among the youth. Although it may have some influence on testing as a requirement for marriages in religious institutions, the number may be small in a study involving just over 300 respondents to raise the statistical power to detect a difference even if there is a difference. The finding of no significant impact of religion was also reported elsewhere where the authors found no statistically significant association between religion and HIV testing (24). Being married was found to increase the Odds of uptake of HIV testing and counselling. Out of the 41 married participants in the study, 32 had tested for their HIV status. This finding is in accordance with a study in Malawi that showed that being married increased the likelihood of testing for HIV than those not married (25). Education was also found to be a determinant of HIV testing as the study showed that the proportion of participants who tested for HIV increased with increasing level of education. Persons who attained tertiary level education were found to have tested for HIV more than the lower categories. Similar findings were reported in a study that investigated HIV testing among university students and the general public and found more university students got tested than the general public (26).

Factors influencing uptake of HIV testing and counseling

The study found that awareness about HIV testing and counseling increased uptake of testing services. The results from this study showed that majority of respondents were aware of HIV testing and counseling services and that those who had heard about testing and counselling services got tested more than their peers. This is supported by the regression analysis that showed a significant association between knowledge about HIV testing and the decision to test for HIV. Therefore, effort aimed at increasing knowledge among the youth regarding HIV testing may increase uptake. The main source of information on HIV testing and counselling was the government hospitals. This findings was also

reported in Nigeria by Nwaozuru, Iwelunmor (24) that with respect to the source of information for HIV testing, most of the participants indicated preference for testing the health facility. Testing and counseling information of HIV should not only be strengthened at the government facilities as found in this study but must be scaled up to include community outreach sensitization. The high source of information on uptake of HIV testing and counseling in the government hospitals may be due to the fact that they were informed when they visited the hospital for a different reason.

Knowledge about location of HIV testing also suggests influencing uptake of testing and counselling. Majority of the youth who knew where HIV testing and counselling services were provided sought testing. Knowing the point of service delivery for HIV testing and counselling suggest to significantly improves uptake of the service. The findings in this study are in agreement with a study in Burkina Faso (22) where respondents reported high HIV-related knowledge and access to information channels through different media outlets that significantly increased HIV testing uptake. Also, a similar study reported that respondents who knew the places of testing were almost twice likely to utilize HIV testing and counselling services (23). Knowing where to get tested for HIV, however, may not be enough but when combined with, for example, regular public education on reducing social stigma and discrimination, will be required to improve uptake of HIV testing among the youth.

The cost of testing and counseling was found to greatly influence uptake of HIV testing as all the 136 people who checked their HIV status reportedly did not pay for the service. It is believed that most of the youth do not know that cost of testing in Ghana is free. Education about the free service to create awareness can be critical to the successful implementation of HIV testing and counselling services. Though majority of the youth may be willing to test for their HIV status but if they are not aware of the free service available, perceived cost and affordability can create a barrier for them. Therefore, government agencies and those involved in implementing HIV testing and counselling should consider schemes that will create awareness to remove any barrier to testing. This finding is supported by a study on HIV testing and linkage to services for the youth in Ethiopia by Kurth, Lally (27) which found that making testing available in the areas where youth gather, and creating user-friendly free or subsidized test kits, increased uptake.

The study also demonstrated that most of the youth did not test for HIV by their own decision but through opportunistic screening. They were recommended for the test after visiting the health facility during ill-health or as a marriage requirement or because they were afraid they might be infected after engaging in risky sexual behaviour. This seems to suggest that most of the youth may only have the opportunity to take HIV test when they visit a health facility for a different reason and not necessarily a decision they have made themselves to go for testing. The study demonstrating that a high proportion of the youth expressed the willing to take an HIV test but only few of them actually testing has serious implications for control as willingness to test for HIV does not necessarily translates to actual testing. A further study into why most of the youth are willing to test for HIV yet have not been tested is warranted to bridge the gap between the willingness to test and actual testing for HIV among the youth.

One significant factor that was revealed in this study was the convenience of the testing and counselling for the youth. More than average proportion of the youth who tested for their HIV status said the services were convenient. The results showed 32.3% of the participants found HIV testing and counselling services were not convenient. The reasons for the inconvenience were largely lack of confidentiality, lack of privacy, lack of trust for the health system and service not always available. The study also citing poor attitude of health service providers affecting uptake of HIV testing and counselling by clients suggests the environment at the point of delivery is crucial to uptake of HIV testing and counselling. This was consistent with the study on the attitude of the youth towards voluntary counselling and testing of HIV/AIDS in Accra, Ghana, where respondents reported fear of their serostatus, lack of confidentiality about their serostatus to others, lack of anonymity and unsuitable testing (e.g., inaccessible, inconvenient and not private) venues as barriers to HTC uptake and mistrust of the health care services (28). Another study in South Africa reported fear of positive results, inconvenient facility opening, cost of transport to testing site among others as the barriers to HIV testing (29). Fear of positive results, stigma, discrimination, lack of trust for their partners and themselves have also been cited as barriers to testing and counselling (15, 19, 29).

HIV testing uptake by strategy

The most common type of HIV testing strategy in the district was the “Know Your Status” but this type of testing is no longer promoted because of the low yield for positive results. “Know your status campaign” was a free mass HIV testing and counseling service often organized by the Ghana Health Service with funding from the National AIDS control programme. Out of the total respondents who responded to the type of HIV testing strategy, 54.8% have ever tested for HIV through the “know Your Status” campaigns. About 21.3% ever tested for HIV through voluntary counselling and testing while 13.6% ever tested for their HIV status through Prevention of mother-to-child transmission. This suggests that in the absence of a major control effort to promote testing, a revised version of the “Know Your Status” campaigns may be a major strategy to increase uptake of HIV testing and counselling among the youth in the district. Also, peer influence was found to significantly increase HIV testing and counselling among the youth. From the simple logistic regression analysis, the participants who had ever heard about HIV testing and counselling from their friends were significantly more likely to check their status after controlling for hospital source information. Targeting youth groups in the community for dissemination of information about HIV testing and counselling may improve uptake.

Limitations of the study

The study was based on self-reported data which is subject to both information and respondent biases. Because the study was cross-sectional, we could only assess associations rather than establishing cause and effect relationship. The findings are also subject to varying interpretation given that confounding effects could not be analyzed.

Conclusion

Giving that about half of the respondents had never had a test and did not know their infection status and citing lack of confidentiality, lack of privacy, mistrust of the health system, inconvenient facility opening hours, fear of positive results and poor attitude of health service providers as barriers to uptake of HIV testing and counselling has serious implications for HIV control in the Kintampo South District if effort is not made to address these concerns among the youth. Age, educational status, marital status and occupation were some demographic factors found to be significant determinants of HIV testing and counselling among the youth. Even though some of the youth showed high level of interest in knowing their HIV status as well as the tendency towards testing for HIV, only few actually took the test, suggesting that willingness to test does not necessarily translate to actual testing and hence effort should be made to revise existing strategies in line with barriers identified in this study to improve uptake of testing and counselling among the youth in the district who are highly vulnerable and are at risk of acquiring HIV/AIDS.

Abbreviations

AIDS

Acquired Immunodeficiency Syndrome

ALHIV

Adolescents Living with Human Immunodeficiency Virus

AOR

Adjusted Odd Ratio

C.I.

Confidence Interval

GDHS

Ghana Demographic and Health Survey

HIV

Human Immunodeficiency Virus

HTC

Human Immunodeficiency Virus Testing and Counselling

PMTCT

Prevention of Mother-to-Child Transmission

SSA

Sub-Saharan Africa

UNAIDS

United Nations Programme on HIV and AIDS

Declarations

Ethics approval and consent to participate

Ethical approval for the study was obtained from the Ghana Health Service Ethical Review Committee, Accra (Reference number: GHS-ERC 50/12/15). Permission was also sought from the Kintampo South District Director of Health Services as well as leaders of the communities where the study was conducted. Informed written consent/assent was obtained from all the survey participants. Written informed consent was obtained from a parent or guardian for respondents below 18 years. All methods were carried out in accordance with relevant guidelines and regulations.

Consent for publication

Not applicable

Availability of data and materials

The dataset(s) supporting the conclusions of this article is (are) available on request from the corresponding author.

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

The authors' contributions were as follows: conceptualization, MK, ADA.; methodology, MK and ADA; formal analysis, MK; writing—original draft preparation, MK, KOA, PN, PE and ADA; writing—review and editing, MK, KOA, PN, PE and ADA; supervision of study, ADA. All authors have read and approved the manuscript.

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Tables

Table 1: Socio-demographic characteristics of respondents 15 to 24 years in Kintampo South District

Variable	Attribute	Respondents N = 309	%	HIV testing status				p-value
				Ever tested	%	Never tested	%	
Age (years)								
	15 - 17	53	20.4	23	43.4	30	56.6	Ref
	18 - 20	69	22.3	28	40.6	41	59.4	0.631
	21 - 24	177	57.3	104	58.8	73	41.2	0.003
Gender								
	Male	152	49.2	79	52.0	73	48.0	Ref
	Female	157	50.8	76	48.0	81	52.0	0.531
Occupation								
	Student	211	68.3	93	44.1	118	55.9	Ref
	Farmer	17	5.5	6	35.3	11	64.7	0.484
	Business	39	12.6	20	51.3	19	48.7	0.407
	Professional	31	10.0	28	90.3	3	9.7	0.001
	Others	11	3.6	8	72.7	3	27.3	0.078
Religion								
	Catholic	91	29.4	43	47.3	48	52.7	Ref
	Protestant	131	42.4	68	51.9	63	48.1	0.495
	Moslem	51	16.5	21	41.2	30	58.8	0.485
	African Traditional	7	2.3	3	42.9	4	57.1	0.823
	Others	29	9.4	20	69.0	9	31.0	0.045
Marital status								
	Single	257	83.2	118	45.9	139	54.1	Ref
	Married	41	13.2	32	78.0	9	22.0	0.001
	Divorced	7	2.2	3	42.9	4	57.1	0.873
	Widowed/widower	4	1.3	2	50.0	2	50.0	0.871
Education								
	Never	13	4.2	6	46.2	7	53.8	Ref
	Primary	60	19.4	27	45.0	33	55.0	0.940
	Secondary	154	50.0	68	44.2	86	55.8	0.889
	Tertiary	82	26.5	54	65.9	28	34.1	0.179

Ref = reference category

Table 2: Factors influencing uptake of HIV testing and counselling among the youth 15 to 25 years in Kintampo South District

Variable/Response	Attribute	Respondents N = 309	%	HIV testing status					
				Ever tested	%	Never tested	%	95% CI	p-value
Ever heard about HTC*	Yes	245	79.3	144	58.8	101	41.2	Ref	
	No	64	20.7	0	0.0	64	100.0	0.073-0.293	0.001
Source of Information	Hospital	169	54.7	110	65.1	59	34.9	Ref	
	Friends	29	9.4	10	34.5	19	48.7	0.123-0.646	0.003
	Private facility	12	3.9	8	66.7	4	33.3	0.310-3.711	0.912
	NGO ^A	23	7.4	11	47.8	12	52.2	0.205-1.182	0.113
	Other	12	3.9	6	50.0	6	50.0	0.166-1.737	0.299
Location of HTC* services	Yes	200	64.7	134	67.0	66	33.0	Ref	
	No	109	35.3	0	0.0	109	100.0	0.067-0.209	0.001
Reasons for HIV testing		155	50.1	154	99.4	1	0.6	0.876-0.928	0.001
Willingness to test	Yes	95	30.7	4	4.2	91	95.8	Ref	
	No	63	20.4	0	0.0	63	100.0	1.066-1.150	0.001
Type of HIV testing	Know your status	86	27.8	85	98.8	1	1.2	581.1-72765.5	0.001
Importance of HIV** testing	Yes	264	85.4	144	54.5	120	45.5	Ref	
	No	45	14.6	11	24.4	34	75.6	0.131-0.555	0.001
Why HIVtesting vital	No one's status	136	44.0	136	100.0	0	0.0	Ref	
	Prevent HIV transmission	6	1.9	6	100.0	0	0.0	0.476-1.406	0.466
	Knowledge about HIV/AIDS	8	2.6	8	100.0	0	0.0	0.327-2.219	0.743
	Build self confidence	2	0.7	2	100.0	0	0.0	0.377-1.820	0.639
	Know blood group	157	50.8	3	1.9	154	98.1	0.636-3.008	0.413
Convenience of HTC services	Yes	179	57.9	105	58.7	74	41.3	Ref	
	No	130	42.1	50	38.5	80	61.5	0.278-0.699	0.001
Causes of inconvenient service	Lack of confidentiality	54	17.5	25	46.3	29	53.7	Ref	
	Distance too far	18	5.8	4	22.2	14	77.8	0.965-1.138	0.079
	Irregular services	9	2.9	5	55.5	4	44.4	0.351-5.995	0.608
	Poor privacy	20	6.5	11	55.0	9	45.0	0.506-3.974	0.007
	Inconvenient time	7	2.3	1	14.2	6	85.7	0.022-1.716	0.140

	Lack of trust for health system	13	4.2	4	30.8	9	69.2	0.141-1.879	0.315
	Poor attitude of providers	10	3.2	3	30.0	7	70.0	0.116-2.129	0.346
Barriers of HTC	Fear of stigma	74	24.0	41	26.5	33	21.4	Ref	
	Fear of discrimination	66	21.4	33	21.3	33	21.4	0.414-1.566	0.523
	Fear of positive results	93	30.1	50	32.2	43	28.0	0.507-1.728	0.832
	Partner and self-trust	59	19.1	26	16.7	33	21.4	0.318-1.262	0.195
	Other	17	5.5	5	3.2	12	7.8	0.107-1.048	0.060

* HTC = HIV testing and counselling

** HIV = Human Immunodeficiency Virus

Ref = reference category

Table 3: Univariate logistic regression analysis of factors influencing HIV testing and counselling among the youth 15 to 24 years in Kintampo South District

Variable/response	Attribute	Respondents	%	Unadjusted OR	95% CI	p-value
Age (years)	15-17	15	20.4	Ref		
	18-20	69	22.3	1.19	0.59 - 2.40	0.631
	21-24	177	57.3	2.48	1.38 - 4.49	0.003
Gender	Male	152	49.2	Ref		
	Female	157	50.8	0.87	0.55 - 1.36	0.531
Occupation	Student	211	68.3	Ref		
	Farmer	17	5.5	0.69	0.25 - 1.94	0.484
	Business	39	12.6	1.34	0.67 - 2.65	0.407
	Professional	31	10.0	11.84	3.49 - 40.16	0.001
	Others	11	3.6	3.38	0.87 - 13.11	0.078
Religion	Catholic	91	29.4	Ref		
	Protestant	131	42.4	1.21	0.71 - 2.06	0.495
	Moslem	51	16.5	0.78	0.39 - 1.56	0.485
	African Traditional	7	2.3	0.84	0.18 - 3.95	0.823
	others	29	9.4	2.48	1.02 - 6.03	0.045
Marital status	Single	257	83.2	Ref		
	Married	41	13.2	4.19	1.92 - 9.13	0.001
	Divorced	7	2.2	0.89	0.19 - 4.03	0.873
	Widowed/widower	4	1.3	1.18	0.16 - 8.49	0.871
Education	Never	13	4.2	Ref		
	Primary	60	19.4	0.96	0.29 - 3.18	0.940
	Secondary	154	50.0	0.92	0.29 - 2.87	0.889
	Tertiary	82	26.5	2.25	0.69 - 7.34	0.179
Ever heard about HTC**	No	64	20.7	Ref		
	Yes	245	79.3	0.15	0.07 - 0.29	0.001
Sources of information	Hospital	169	54.7	Ref		
	Friends	29	9.4	0.28	0.12 - 0.65	0.003
	Private facility	12	3.9	1.07	0.31 - 3.71	0.912
	NGO	23	7.4	0.49	0.21 -	0.113

					1.18	
	Other	12	3.9	0.54	0.17 - 1.74	0.299
Location of HTC services	No	109	35.3	Ref		
	Yes	200	64.7	0.12	0.07 - 0.21	0.001
Convenience of HTC services	No	130	42.1	Ref		
	Yes	179	57.9	0.44	0.28 - 0.69	0.079
Causes of inconvenience	Lack of confidentiality	54	17.5	Ref		
	Distance too far	18	5.8	0.33	0.97 - 1.14	0.608
	Services not available	9	2.9	1.45	0.35 - 5.99	0.507
	Lack of privacy	20	6.5	1.42	0.51 - 3.97	0.140
	Inconvenient time	7	2.3	0.19	0.02 - 1.72	0.315
	Lack of trust for health system	13	4.2	0.52	0.14 - 1.88	0.346
	Poor attitude of health providers	10	3.2	0.50	0.12- 2.13	0.145
Willingness to test	No	63	20.4	Ref		
	Yes	95	30.7	1.09	1.066 - 1.115	0.001

* Factors that have an effect $p \leq 0.05$, ** HIV testing and counselling
Ref = reference category, OR = odds ratio

Table 4: Multivariate logistic regression analysis of uptake of HIV Testing and Counselling among the youth 15 to 24 years in Kintampo South District

Variable	AOR	95% CI	P-value
Age	4.95	0.68 - 36.34	0.115
Occupation	1.81	0.89 - 3.66	0.101
Marital status	1.61	0.33 - 7.90	0.560
Convenience of test	0.44	0.07- 2.78	0.383
Willingness to test	1.11	1.06 - 1.15	0.001
Importance of HTC*	0.29	0.01 - 6.34	0.379
Location of HTC services	0.97	0.85 - 1.1	0.659
Ever heard about HTC Services	17.19	-NE	0.668
Source of HTC information	0.97	0.86-1.09	0.614

* HIV testing and counselling
AOR = adjusted odds ratio, NE = not estimable

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