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Assessment of Voluntary HIV Counseling and Testing Service Utilization and Associated Psychosocial Factors Among Secondary School Teachers in Nyando, Kisumu County Kenya: A Descriptive Cross Sectional Survey

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Abstract
Voluntary HIV counseling and testing (VCT) is one of the key tools in the HIV/AIDS prevention and control programs in Kenya. But utilization of VCT services among out secondary school teachers in Kenya is low. The aim of this study was to assess Voluntary HIV Counseling and Testing Service utilization and associated psychosocial factors among secondary school teachers since even though most school-based HIV interventions in sub-Saharan Africa rely on teachers as behavior formation and behavior-change agents to deliver prevention messages to school children, their utilization of HIV VCT services has been low. The study sample consisted of 255 secondary school teachers (36% females and 64% males) out of a total of 753 teachers from 73 secondary schools in the seven divisions in Nyando district. Stratified sampling was used to select the number of schools per division to be included in the study while Simple random sampling was then used to select schools in each division. Self-administered questionnaires and focus group discussions were used to estimate the prevalence of VCT service utilization and to assess associated psychosocial factors among the secondary school teachers. Cross tabulation was used to show relationships between the independent and the dependent variables, and chi-square was used to test for existence of relationships between the variables, $p<0.05$ was considered statistically significant. Information from in-depth discussions was analyzed manually using qualitative methods. The data was presented descriptively and through the use of frequency tables and bar graphs. This study found that less than half (48%) of the respondents had utilized VCT services. The majority of teachers (38%), who had utilized the VCT services did so "in order to know their HIV status/plan their future". The study also found a positive association between utilization of VCT services, and perception of the importance of VCT as an HIV/AIDS control strategy (p=0.039). Spousal approval of VCT utilization emerged as the most significant social factor affecting utilization of VCT services (p=0.019). HIV/VCT utilization among secondary school teachers in Nyando County remain low especially among male teachers. HIV/AIDS prevention and control programs among secondary school teachers in Nyando County should focus on the above areas.
Keywords: HIV testing, VCT utilization, Knowledge, Secondary school teachers, Nakuru Kenya**.**

1. Background

Sub-Saharan Africa remains the most heavily affected region in the global HIV epidemic (UNAIDS 2012). In 2011 for example; an estimated 23.5 million (22.1–24.8 million) people living with HIV resided in Sub-Saharan Africa, representing 69% of the global HIV burden (UNAIDS 2012). East and Southern Africa is one of the region's hardest hit by HIV as it is home to 19.4 million people living with HIV, a figure that is over 50% of the total number of people living with HIV in the world (UNAIDS AIDS info 2017).The HIV epidemic in this region is generalized but young women, men who have sex with men, sex workers, prisoners and people who inject drugs are at an increased vulnerability to infection (UNAIDS AIDS info 2017). Kenya is one of the Sub-Saharan Africa countries (SSA) that has been affected by a generalized and a concentrated HIV epidemic, where the epidemic is deeply rooted among the general population while there is also concentration of very high prevalence among key populations for example sex workers, their clients, and men who have sex with men (National AIDS and STI Control Programme Kenya Preliminary Report 2012).HIV/AIDS epidemic in Kenya had the joint fourth-largest HIV epidemic in the world (alongside Mozambique and Uganda) (UNAIDS 2013).
The first case of HIV in Kenya was detected in 1984, and by the mid-1990s it was one of the major causes of mortality in the country putting huge demands on the healthcare system as well as the economy (NACCK 2012). HIV prevalence peaked at 10.5% in 1996, and had fallen to 6% by 2013 mainly due to the rapid scaling up of

antiretroviral treatment (ART) (Mugo et al. 2010).

Like all members of the population, however, teachers are susceptible to HIV. Early in the epidemic it was thought that teachers were at relatively high risk of HIV infection due to their high levels of social mobility. (Bennell et al. 2002, Hargreaves & Glynn 2002) The majority of evidence now available, however, seems to indicate that prevalence rates among teachers are similar to those found in the general population (Boler 2004). Even though there is no comprehensive data about AIDS-related deaths among teachers, available information suggests that deaths among teachers has been increasing over the past two decades, with AIDS being the largest hypothesized contributor (Kiragu et al. 2008).

However, It is estimated that the number of teacher deaths in Kenya tripled between 1995 and 1999, with HIV and AIDS thought to be the largest contributor to teacher mortality (Kelly 2000) An analysis by the International Labor Organization on the impact of HIV and AIDS on human capital suggested that Kenya was second only to South Africa in the sheer number of teachers dying from HIV infection by 2010, well ahead of Nigeria, Zimbabwe, and Uganda (Cohen 2002). The Kenya's teaching profession was estimated at 240,000-strong a few years ago; including 10,000 teachers who were HIV of which 3,000 had gone public about their status and participated in the support group 'Teachers with AIDS' (Barimbui & Miller 2008)Teachers play a key custodian role within the education system as they are not only role models, mentors and guardians; but they are also central to efforts to achieve the Education for All (EFA) and Millennium Development Goals (MDGs), as education is seen both as a right and as a central pillar of efforts to eradicate poverty(UNESCO and EI - EFAIDS 2007) Teachers in countries with high HIV prevalence rates are both infected and affected by the virus.. Every month, 100 Tanzanian primary school teachers are estimated to die of AIDS - related illnesses and in 2006 alone an estimated 45,000 additional teachers were needed to replace those lost to the epidemic (Beckmann & Rai 2004). Most school-based HIV interventions in sub-Saharan Africa rely on teachers as behavior formation and behavior-change agents to deliver prevention messages to children(Kiragu *et al.* 2006) Seven thousand additional teachers will need to be trained in Swaziland by 2020 to compensate for AIDS deaths among teachers (UNESCO and EI - EFAIDS 2007). In Kenya, over 14,500 teachers were thought to be HIV - positive (UNESCO and EFAIDS 2006)

In some countries, a tenfold increase in teacher mortality and absenteeism due to HIV and AIDS has severely reduced both teaching time and quality taking into account that, permanent or temporary absenteeism of one teacher can have strong repercussions on up to 100 children (Rispel 2006) • HIV and AIDS are reported to account for up to 77% of teacher absenteeism in countries with high prevalence rates (Global Campaign for Education (GCE) 2006).

The Government of Kenya, with other stakeholders, developed a national HIV/AIDS strategic plan that identified strategies to alleviate the spread of HIV/AIDS (NACCK 2012). One of the key strategies since 2001 has been the establishment of Voluntary Counseling and Testing (VCT) services, which has spread rapidly throughout the country (UNAIDS 2016).HIV Counseling and Testing has been a major focus of the response in Kenya with the country adopting multiple strategies including provider initiated testing, outreach testing, home based Counseling and Testing, and integration of testing and counseling in ANC, STI and SRH services (NACCK 2012).

Voluntary counseling and testing is an effective strategy for preventive effects on HIV transmission and serves as a gateway to most HIV/AIDS related services (Tesfaye et al. 2012). In addition, VCT is an important entry point to other HIV/AIDS prevention services, including emotional support, increasing motivation to avoid risky behaviors, access to HIV specific treatment, care and support (Fisher et al. 2007).

But the uptake of VCT services in Sub-Saharan Africa has been disappointingly low, with reports of 12% to 56% among couples or the general population (UNAIDS 2001). Other reports have supported the findings that despite the potential benefits of VCT, the uptake is often poor regardless of the availability of the services (WHO 2003; Matovu & Makumbi 2007; NASCOP 2007).In Kenya for instance, only 72% of adults aged 15-64 years reported having ever been tested for HIV in 2012 (Irungu et al. 2008). HIV infection is highest in the 24-55 years age bracket, which forms the bulk of the workforce and where investments in education begin to pay off (Kiragu et al.2008) AIDS-related morbidity and mortality strike at the prime years of life; thus, impairing the earning capacity and resulting to socio-economic devastation at the individual, community and national levels (Kiragu et al. 2008, UNAIDS AIDS epidemic update 2006).

Teachers living with HIV have an important role to play, both in efforts to prevent new infections and in helping to address the impact of HIV and AIDS on individuals, institutions and communities. For example, 75% of teachers recently surveyed in Kenya stated they did not know their HIV status and 60% of those not tested indicated that they did not want to know their status because they feared discrimination (UNESCO and EI - EFAIDS. 2007). In Thika district in Kenya HIV-VCT service utilization was found to be only 30.5% (Merita et al.2011).

Stigma and discrimination, may also, pose barriers to their involvement and the support available. (UNESCO and EI - EFAIDS 2007).While most education ministries have policies related to teachers and HIV &

AIDS, in many cases those policies do not transfer to the school level due to lack of implementation and action plans and limited resources for supporting infected and affected teachers (UNESCO and EI - EFAIDS 2007).In the former Central Province HIV-VCT utilization was found to be only 30 **%(** Merita et al. 2011).These reserchers also found that those teachers who were scared by the HIV prevalence in their area were three times less likely to utilize HIV-VCT services. In a study on the needs of the Kenya teachers (Kiragu et al 2006), found that although well educated, many teachers are confused or uninformed about important aspects of HIV prevention. For example, many teachers are uncertain about the effectiveness of condoms in protecting against HIV infection. The researchers concluded that some teachers are not likely to advocate for their use despite the existence of a generalized HIV epidemic in Kenya (Kiragu et al. 2006)

It is against this back ground that this study sought to identify psychosocial factors among secondary school teachers in Nyando, Kisumu County which may affect their utilization of VCT services.

2. Methodology

2.1 Study Area and Design

The study was done in the former Nyando District, now a division in Kisumu County, Kenya. Nyando District was one of the 12 districts in the former Nyanza Province. The district borders Kisumu District to the west, Nandi District to the north, Kericho District to the east and Rachuonyo District to the south. The district had six Divisions namely: Upper Nyakach, Lower Nyakach, West Nyakach, Nyando, Miwani and Muhoroni. It had a total land area of 1168.4 km^2 and a population of 332,137; 162,381 males and 169,756 females (ROK 2002). The most prevalent diseases in the district were malaria, URTI, diarrhea, skin diseases and worms. There were 35 health facilities in the district which consisted of 1 GOK hospital, 2 sub-district hospital, 2 private hospitals, 9 health centers, 16 dispensaries, and 5 Nursing/maternity homes. The average distance to the nearest health facility was 5 kilometers with a doctor/patient ratio of 1:50,000. The district had 12 VCT sites. The district was purposely chosen for this study due to its relatively high level of HIV/AIDS prevalence which stood at 7.5% (NACC 2007), which was above the national average of 5.1%. The area was also accessible and familiar to the researchers

Nyando Division had 73 secondary schools with 753 teachers; 473 males and 280 females. Stratified sampling was used to determine the number of schools per administrative unit to be included in the study. Simple random sampling was then used to select the particular schools that participated in the study in each administrative unit. All consenting teachers in the 26 selected schools were eligible to participate in the study.

Questionnaires were administered to this group in the various administrative units during an 8 week period.

2.2 The study population

The study included all secondary school teachers teaching in Nyando District at the time of the study who gave informed consent. All other non-secondary school teachers in Nyando, and those who did not give consent were excluded from the study

2.3 Sample size determination and sampling techniques

Sample size determination

The minimum sample size of respondents was obtained using a formula as used by Fisher *et al.* (1998) shown below:

$$N=\frac{z^2pq}{d^2}$$

Where; N= the desired sample size, z= normal deviate which corresponds to 95%
Confidence interval, p =0.2 (20%); the proportion of the study population estimated to have utilized VCT services (Kiragu *et al.,* 2006), q=1-p, d =degrees of freedom = 0.05.

Thus, $N= \frac{1.96^2x0.2x0.8}{}$, this was approximately =246

2.4 Sampling techniques

Nyando District had six divisions with 73 secondary schools and 753 teachers. This gave an average of about 10 teachers per school. With a minimum sample size of 246, at least 25 secondary schools were needed to obtain a representative sample of the study population. The number was however increased to 26 to cater for attrition and respondents who would be unwilling to participate in the study. Stratified sampling was used to determine the number of schools per division which were to be included in the study. Simple random sampling was then used to select schools from each division. All consenting teachers in the selected schools were eligible to participate in the study.

2.4 Pilot study
A pilot study was conducted in two randomly selected schools in the neighboring Kisumu District, which had similar characteristics as the study area. The main purpose was to ensure the validity and reliability of the data collection instruments and their suitability to the study. After piloting, the data collection instruments were adjusted accordingly

2.5 Data collection techniques
The questionnaires were personally administered to the respondents by the researchers. This was found necessary in order to avoid the possibility of the respondents discussing the possible responses among themselves, or people not included in the study sample, answering the questions. Focus group discussions (FGDs) were also held with all consenting respondents divided in groups of 8-1

2.6 Data analysis
Data from filled questionnaires was coded and entered into the computer using SPSS version 11.5. Cross tabulation was done to establish the relationships between the independent and the dependent variables. Analysis was done using the chi-square test and $p<0.05$ was considered statistically significant. Information obtained from in-depth discussions was analyzed manually using qualitative methods

3. Ethical considerations
Permission for carrying out the study was obtained from the Graduate School of Kenyatta University and the Ministry of Higher Education, Science and Technology. The researchers sought and obtained informed consent from the respondents

4. Results
4.1 Socio-demographic characteristics of the study population
Table 4.1: Socio-demographic characteristics of the study population

Socio-demographic characteristics		**Number**	**Percentage (%)**
Gender	Females	91	36
	Males	161	64
Level of education	KCSE/Form 4	12	5
	KACE/Diploma	36	14
	Degree	186	74
	Post-graduate degree	17	7
Age	15-24 years	27	11
	25-34 years	95	38
	35-44 years	110	43
	45 years and above	20	8
Marital status	Single	47	19
	Married/cohabiting	187	75
	Divorced/separated	3	2
	Widowed	12	4
Religious affiliation	Protestants	156	63
	Catholics	85	34
	Muslims and others	6	3
Area of residence	Urban	74	29
	Rural	176	71

The results in table 4.1 indicate that majority (64%) of the respondents were males, and most (74%) had degree level of education. The largest proportion of respondents (43%) were aged 35-44 years while only 8% were aged above 45 years. In addition, (75%) of the respondents were married or cohabiting, while about 4% were widowed. The results also indicated that the majority (63%) of the respondents were protestants, and most of the respondents (71%) lived in the rural areas.

4.2 The level of utilization of VCT services among the study population
The results in figure 4.2 show that the majority (52%) had not utilized VCT services.

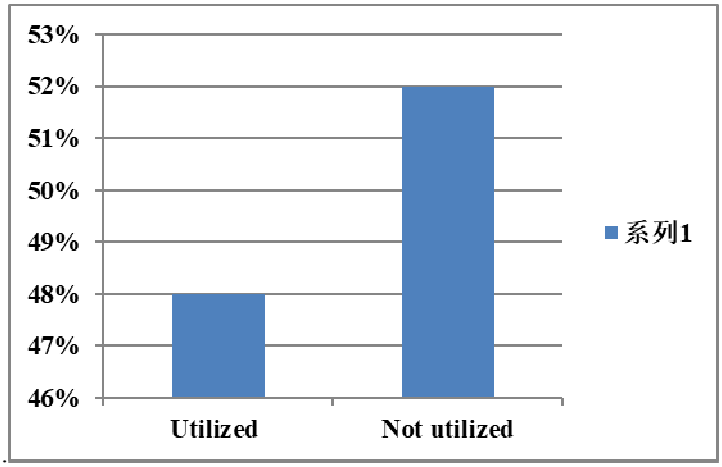

Figure 4.2: The level of utilization of VCT services

The results in figure 4.3 further indicate that the majority (53%) had utilized VCT services only once**.**

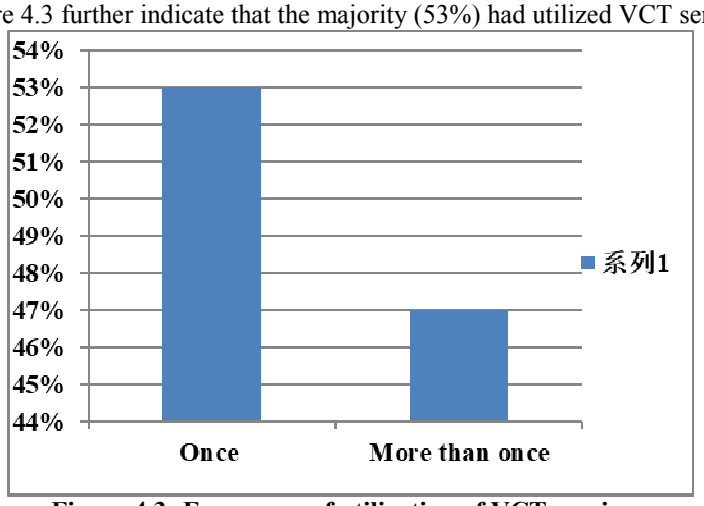

Figure 4.3: Frequency of utilization of VCT services.

4.4 Psychosocial factors affecting utilization of VCT services

4.41 Motivation/Reason for going to visit HIV-VCT center

The results in table 4.4 indicate that (38%) of the respondents gave the reason for going for VCT as "To know my status/plan my future". Other major reasons cited were influence by the mass media (7%), influence by friends/colleagues (6%) and blood donation (6%). Many respondents also mentioned mandatory HIV testing during pregnancy and before marriage. Many female respondents said that they had gone for VCT as part of their prenatal care. "*I have gone for VCT twice, and in each case I was expectant and was required to undergo an HIV test part of the prenatal care",* said a 30 year-old respondent. A 26 year-old male respondent who had recently married said, "*In our church, it is a requirement that a couple has to undergo an HIV test before exchanging marriage vows".*

Table 4.4: Motivating factors to utilization of VCT services

	Responses	**Number of responses**	**Percentage (%)**
1.	To know my status/plan my future	46	38
2.	Influenced by the mass media campaign	9	7
3.	Influenced by friends/colleagues	7	6
4.	Blood donation	7	6
5.	Influenced by spouse/ relative	5	4
6.	After sex with a partner who is not trusted	5	4
7.	Poor health of spouse/child	4	3
8.	Undergoing treatment	4	3
9.	Poor health of self	2	2
10.	After a risky sexual behavior	1	1

Results in table 4.5 indicate that (22%) of respondents cited "fear of a positive results" as being a deterrent to utilization of VCT services. Other major reasons cited were: long distances to the nearest VCT centers (4 %),

and fear of stigma (4%).

Table 4.5: Barriers to utilization of VCT services

	Responses	Number of responses	Percentage (%)
1.	Fear of a positive result	29	22
2.	Long distance to the nearest VCT	5	4
3.	Fear of stigma	5	4
4.	No need since there is no cure for HIV/AIDS	3	2
5.	Fear of family break-up in case of a positive result	1	1
6.	Fear of contracting HIV during testing	1	1
7.	Inadequate testing equipment	1	1

4.6 Attitude

The majority (60%) of the respondents agreed that VCT was an important HIV/AIDS control strategy, while 27% disagreed and 13% did not know (table 4.6).The results (X^2=6.509; *df*=2; *p*=0.035) indicated that a significantly larger proportion of respondents who perceived VCT as an important HIV/AIDS control strategy had utilized the services.

4.7 Self-perception of risk

The majority of respondents (60%) thought they were at risk of HIV infection. But only 28% of those who felt at risk of infection by HIV had utilized VCT services. Though (32%) of the respondents felt at risk of infection, they still did not wish to know their HIV. The results (X^2=0.022; *df*=1; *p*=0.883) indicated that there was no significant relationship between self-perception of risk and utilization of VCT services.

Table 4.6: Perception factors affecting utilization of VCT services

Psychological factor	Response	Utilized VCT	Not utilized VCT	Chi-square statistic
Perception of adequacy of present motivation to utilize VCT services	Yes	72(29%)	72(29%)	X^2=2.894 *df*=2 *p*=0.235
	No	33(13%)	34(14%)	
	Do not Know	12(6%)	23(9%)	
	Total	117(48%)	129(52%)	
Perception of VCT as an important HIV/AIDS control strategy	Yes	68(28%)	79(32%)	X^2=6.509 *df*=2 *p*=0.039
	No	39(16%)	27(11%)	
	Do not know	10(4%)	21(9%)	
	Total	117(48%)	127(52%)	
Self-perception of risk	Yes	68(28%)	77(32%)	X^2=0.022 *df*=1 *p*=0.883
	No	45(19%)	52(21%)	
	Total	113(47%)	129(53%)	

The majority (77%) of the respondents were willing to go for VCT services in the near future. Many respondents said that they had not sought VCT services because of procrastination. "*Every time I want to go for VCT, something comes up and I postpone it. I keep on postponing it until I have lost count of the number of times I have done so*", said a 24 year-old female respondent.

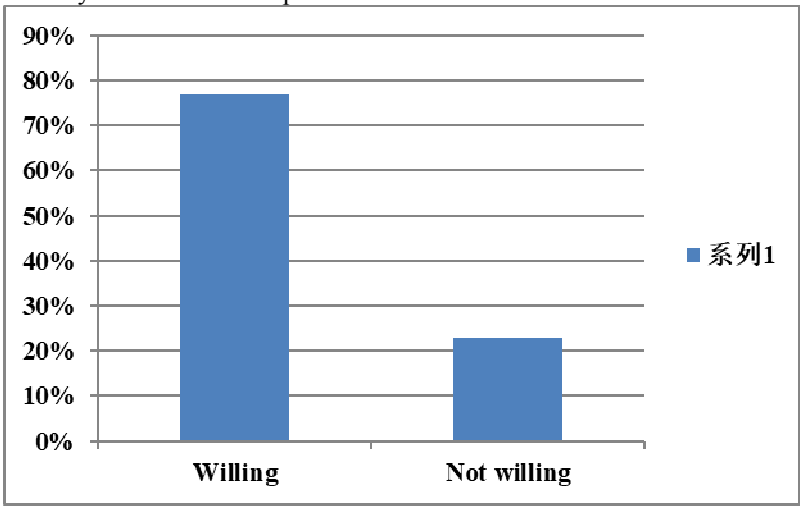

Figure 4.7: Willingness to utilize VCT services in the near future

4.8 Social norms and interactions

A large proportion (73%) of the respondents agreed that VCT was a socially acceptable norm in their communities. However, the results (X^2=0.019; *df*=1; *p*=0.890) indicated that there was no significant relationship between social norms and utilization of VCT services.. According to a 39 year-old male respondent, "*due to the stigma associated with HIV/AIDS, most members of our community rarely discuss issues related to HIV/AIDS openly hence limiting the possibility of VCT becoming a socially acceptable norm in our community. In fact, most of our people believe that promotion of VCT services is the responsibility of government agencies, NGOs and health personnel*".

Results in the study indicate that less than half (44%) of the respondents belonged to any social group(s) whish approved of VCT utilization (table 4.8). Among those who belonged to the groups, only 35% had gone for VCT. The results (X^2=1.396; *df*=1; *p*=0.237) indicated that there was no significant relationship between membership to social group(s) which approved VCT utilization. "*Most of the times our discussions center on politics, economic empowerment and spiritual nourishment for some of us who are saved. Rarely do we discuss utilization of VCT services in our social groups",* said a 38 year-old male respondent.

77% of respondents indicated that their peers/colleagues/neighbors approved VCT utilization. However, only 46% of respondents whose peers/colleagues/neighbors approved VCT utilization had gone for the services. The results (X^2=0.596; *df*=1; *p*=0.440) indicated that there was no significant relationship between VCT approval by peers/colleagues/neighbors and utilization of VCT services

Though the majority (83%) of the respondents had spouses who approved of VCT service utilization, only 40% of them had utilized VCT services. The Results (X^2=5.507; *df*=1; *p*=0.019) indicated that a significantly larger proportion of respondents whose spouses approved VCT service utilization had utilized the services. Many respondents also said that they had utilized VCT services after encouragement by their spouses. A 29 year-old married female respondent who had gone for VCT said, "*I went for VCT after encouragement by my husband. Had he not encouraged me I doubt if I could have gone for it*".

Table 4.8: Social factors affecting utilization of VCT services

Social factor	Response	Utilized VCT	Not utilized VCT	Chi-square statistic
Perception of VCT as a socially acceptable norm	Yes	85(35%)	94(38%)	X^2=0.019 *df*=1 *p*=0.890
	No	32(13%)	34(14%)	
	Total	117(48%)	128(52%)	
Membership to social group(s) which approve of VCT utilization	Yes	43(18%)	39(16%)	X^2=1.396 *df*=1 *p*=0.237
	No	72(30%)	90(36%)	
	Total	115(48%)	129(52%)	
Perception of VCT utilization by peers/colleagues/ neighbors	Yes	84(35%)	99(42%)	X^2=0.596 *df*=1 *p*=0.440
	No	29(12%)	27(11%)	
	Total	113(47%)	126(53%)	
Spousal approval of VCT utilization	Yes	79(40%)	84(43%)	X^2=5.507 *df*=1 *p*=0.019
	No	9(5%)	25(12%)	
	Total	88(45%)	109(55%)	

4.9 Preferred methods of VCT service delivery

Table 4.9: Preferred methods of VCT service delivery

	Responses	Number of responses	Percentage (%)
1.	Self-testing with results known to myself	159	62
2.	Testing saliva or mouth swab instead of blood	49	19
3.	Counselors should be males only	6	2
4.	Counselors should be females only	3	1
5.	Counselors should be both males and females	193	76
6.	VCT services should be mobile provided at home and at places of work	152	60
7.	There should be monetary incentives for people to go for VCT	43	19
8.	VCT services be offered on a 24-hour basis	89	35

The results in table 4.7 indicate that majority (76%) of the respondents preferred that counselors at all VCT centers be both males and females. Sixty two percent (62%) of respondents preferred an option of self-testing where the results remained known to the client only while sixty percent (60%) of the respondents preferred that VCT services be made mobile provided at home and at work places. Thirty five percent (35%) of the

respondents preferred that VCT services be offered on a 24-hour basis. Some people seen going for VCT were thought to be HIV positive. "*The last time I went for VCT some people who saw me started spreading rumors among my friends, relatives and neighbors that I was HIV positive and this has discouraged me a lot from ever going for the services again*", said a 28 year-old male respondent. Nineteen percent (19%) of respondents preferred that saliva or mouth swab be used during HIV testing instead of blood while some respondents (19%) felt that monetary incentives should be used to encourage people to go for VCT.

5. Discussion

Voluntary Counseling and Testing (VCT) has proven to be one of the most powerful tools in halting the spread of HIV/AIDS, and it is known to be an important component in HIV/AIDS prevention strategies (Fisher et al. 2007). Though various studies have shown low utilization of VCT service particularly in developing countries (Fisher et al. 2007), this study assessed the level of VCT utilization and possible associated psychosocial factors among secondary school teachers in Nyando, Kisumu County in Kenya. This study found that less than half (48%) of the respondents had utilized VCT services. The level of utilization of VCT services among our study population though low ,was still higher than that found in a community study by Kimani *et al.* (2007) of 38% VCT utilization among community members and 20% VCT utilization among Tanzania Teachers (Kakoko et al. 2006).

Psychosocial factors and VCT utilization

In this study, the majority of teachers (38%), who had utilized the VCT services did so "in order to know their HIV status/plan their future". Our findings are similar to an Ethiopian study which found that of the teachers who utilized VCT services, 51.1% wanted to know their HIV status and 40.9% did so, for planning future life (Woudneh Gereme Desta et al. 2007). Other reasons cited by our respondents for VCT utilization included; influence by the mass media (7%), friends/colleagues (6%) and blood donation (6%).In this sudy, most respondents (22%) cited fear of a positive result as being the deterrent to their utilization of VCT services. Other major reasons cited were: long distances to the nearest VCT centers (4 %), and fear of stigma (4%).These figures are less but similar to a study among Ethiopian teachers who cited main reasons for not utilizing VCT services as fear of knowing the results and fear of stigma(Woudneh Gereme Desta et al. 2007). In our study, the majority (60%) of the respondents agreed that VCT was an important HIV/AIDS control strategy, while 27% disagreed. The results (X^2=6.509; *df*=2; *p*=0.035) further indicated that a significantly larger proportion of respondents who perceived VCT as an important HIV/AIDS control strategy had utilized the services. These findings are similar to another Kenyan study among teachers, which found that, teachers perceiving HIV testing as 'very important' had about 1.5 times the odds of taking HIV testing as those hinting that it is not important (Tangus et al.2014).

Self-perception of risk.

Though the majority (60%) of teachers in our study, felt that they were at risk of HIV infection only 28% of those perceiving themselves to be at risk had utilized VCT services. Of the minority (40%) who perceived themselves not to be at risk, only (19%) had utilized VCT services. Our findings are similar but less so than another Kenya study among teachers which indicated that teachers perceiving themselves to be 'very susceptible' to HIV infection had about 2.3 times the odds of utilizing VCT services as those believing that they were 'not susceptible' (Tangus et al. 2014).Another study in Ethiopia among primary and secondary school teachers also indicated that perceived risk of HIV had a positive association with being ever tested (Takele et al. 2015)

Social

In our study, spousal approval of VCT utilization, emerged as the most significant social factor affecting utilization of VCT services (*p*=0.019). The finding concurs with the study by Thornton (2005) which found that VCT approval by a spouse impacted positively on the decision of an individual to go for VCT. Our findings are also similar to a study by Kingsley et al (2007) which found that a majority (89%) of pregnant women in Nigeria were willing to go for VCT if they were accompanied by their spouses. However, unlike Thornton (2005) and Smith (2005), the study found no significant relationship between utilization of VCT services and social norms, or VCT approval by peers/colleagues/neighbors. Our finding are however in contrast to a study by Kamanga (2006) which found a positive association between membership to clubs which approve of VCT utilization, and utilization of the services (*p*=0.01)

Preferred methods of VCT service delivery

A large proportion (76%) of teachers in this study, preferred that counselors at the VCT centers be both males and females. These findings are similar to a study by Kipitu (2005) which found that the majority of VCT clients would have preferred VCT counselors to be both males and females. In this study, a large proportion (62%) of respondents preferred an option of self-testing where the results remained known to the client only. Our findings are consistent with a study by Spielberg *et al.* (2003) which found that a larger proportion (61%) of respondents preferred self home-based HIV testing. Similar findings by Keller (2009) also indicated that the majority (91%) of respondents found self-testing preferable. Sixty percent (60%) of the respondents preferred that VCT services

be made mobile provided at home and work places. This concurs with the finding of the study by Mutale et al (2010) and Kimani et al (2007) which found which found that majority of respondents preferred mobile VCT .

Thirty five percent (35%) of the respondents preferred that VCT services be offered on a 24-hour basis. The finding is consistent with that of the study by Odeny (2010) which indicated that many people preferred accessing VCT services in the evenings or early nights. The respondents said that during the day they were busy and could not find time to go for the services. Nineteen percent (19%) of the respondents preferred that saliva or mouth swab be used during HIV testing instead of blood. This concurs with the finding of the study by Keller (2010) which found that majority of the respondents preferred the OraQuick test which involves the use of oral fluids, to the Uni-Gold test which involves the use of blood. Nineteen percent (19%) of the respondents preferred monetary incentives for VCT clients. This is consistent with the finding of the study by Thornton (2005) which found that randomly assigned monetary rewards increased overall VCT attendance by over 100%.

6. Conclusion

Perception of the importance of VCT as an important HIV control strategy and willingness to utilize VCT services in the near future were the most significant psychological factors affecting utilization of VCT services. A significantly larger proportion of respondents who perceived VCT as an important HIV/AIDS control strategy had utilized the services compared to those who did not have such perception (p=0.039). In addition, majority (77%) of the respondents were willing to utilize VCT services in the near future. Spousal approval of VCT services emerged as the most significant factor affecting utilization of VCT services. Individuals whose spouses approved VCT utilization were more likely to have utilized VCT services .The majority of the respondents preferred the following approaches to VCT service delivery: deployment of both male and female counselors at all VCT centers, self-testing with the results known to the client only, providing VCT services on a 24-hour basis, mobile VCT services provided at home and at places of work, and use of saliva or mouth swab for testing instead of blood..

Competing interest

The authors declare that they have no competing interests

Authors' contributions

AO made significant contribution to the conception and final drafting and revision of the study.JO participated in conception and initial design, drafting, statistical analysis and interpretation of study findings .OP, 0A and KM; participated in revision of the manuscript and intellectual input. All authors read, edited and approved the final manuscript.

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