



Behavioral change after voluntary HIV counseling and testing among adults in Kilimanjaro Region, Tanzania

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ABSTRACT

This clinic-based cross sectional study aimed to assess the risky sexual behavior changes in the number of sexual partners after HIV counseling and testing among adults in Kilimanjaro Region in Tanzania in 2008. The study used a structured questionnaire to collect demographic data among 90 clients at three Voluntary Counseling and Testing (VCT) sites in Moshi Municipality, Kilimanjaro Region. The mean age was 33.5(±9.6). Sexually active respondents were 66.7%. Overall, 81.1% reported multiple sexual partnerships [mean (SD): 3.8 ± 1.3]. Males were more likely to report multiple sexual partners than females (OR) = 3.8 [95% CI 1.5- 9.8]; P < 0.005). Males' mean number of lifetime sexual partners before VCT was 1.5 and 1.1 after VCT, which decreased significantly (f= 3.6; p = 0.014). The mean number of sexual partners in the past 3 months before VCT was 1.5 and 1.1 after VCT, which decreased significantly (f=113.7; p = 0.000). The mean number of those who reported sex in the past 3 months was 1.6 before VCT and 1.1 after VCT, which decreased significantly (f= 5.9; p = 0.019). Females' mean number of sexual partners in the past 3 months before VCT was 1.2 and 1.1 after VCT, which decreased significantly (f= 2.9; p = 0.000). The mean number of casual sexual partners was 1.3 before VCT and 1.1 after VCT, which decreased significantly (f= 4.7; p = 0.022). In conclusion, most participants are sexually active and practice multiple sexual partnerships; more VCT screening efforts and awareness are needed to reduce number of sexual partners among at high-risk people in Tanzania.

Keywords: voluntary counseling and testing, sexually active, multiple sexual partnerships, HIV/AIDs, Tanzania

INTRODUCTION

To a large extent HIV/AIDS is a behavioural disease; thus its transmission can be prevented; mostly through changes in individuals' behavior by adopting risk reduction practices¹, Voluntary Counselling and Testing (VCT) is one of the globally accepted HIV interventions approaches, which tries to link the knowledge of sero-status, prevention and treatment^{2,3,4}. Existing evidence suggest that knowing individual's HIV status can influence one to be more carefully and adapt HIV preventive behaviors, such as faithfulness or abstinence^{5,6}.

VCT as prevention and control method provides clients with information and support for behavioral change. The uninfected may take risk reduction options while those who are infected cope positively with the infection^{7,8,9,10,11}.

Studies in the United States reported that about 70% of individuals with HIV have remained sexually active after knowing that they have been infected^{3,12}. Several studies have reported conflicting findings on the protective effect of VCT in the reduction of number of partners and acquiring new infections; a study in Mozambique reported an increase in condom use among VCT clients; however, an increase of

casual sex was also noted. Similar findings were observed among Zimbabweans¹³. Some studies in Kenya, including meta-analysis of seven studies showed that VCT approach had no significant effect on the reduction of number of sex partners^{14,15}.

In the other hand, some studies in the same area have reported the decrease in the number of sexual partners and un-protected sex went down from 95% to 89% among VCT clients following HIV testing. In addition, the change in the episodes of sexual intercourse for either primary or non-primary partners before and after VCT has been reported¹⁶.

Given the escalating problem many African countries are in the process of scaling –up VCT and the Providers Initiated HIV Testing and Counselling (PITC) programs. However, still there is a strong debate on the evidence to support VCT as an effective strategy due to the existing conflicting evidence regarding the effect of VCT on behaviour change. Little is known about the impact of VCT in Tanzania, our objective was to assess the changes in the number of sexual partners after HIV counseling and testing among adults in Kilimanjaro Region in Tanzania. Findings from this study will add knowledge to the literature by exploring how VCT may influence behavioral change and provide a basis for designing an effective VCT and HIV prevention programme for at high risk people in urban communities of Tanzania.

MATERIALS AND METHODS

This was a clinic-based cross-sectional study carried at three VCT sites in Moshi Municipality from April-June in 2008.

The study was conducted at Moshi Municipality in Kilimanjaro. Kilimanjaro region rank number 6th in the country where as HIV prevalence was estimated to be 5.8% and only about 4.2 % knows their HIV status¹⁷. Within Moshi municipality, there are about 20 VCT centres¹⁸. Two VCT centres with high attendance were purposively selected for this study, namely; *ANGAZA (a free standing VCT site)* and *Kikundi cha Wanawake Kilimanjaro Kupambana na Ukimwi* (KIWAKKUKI- translated in English as an

association of women groups to fight against HIV/AIDS in Kilimanjaro). Angaza serve mixed population where as KIWAKKUKI centre serves mainly females. The HIV screening programs carried out in the study site includes VCT, PITC, and Prevention from Mother to Child Transmission (PMTCT).

A total of 90 participants (45 males and 45 females) were randomly selected to take part in the study. Participants who consented to participate, aged above 18 years and have tested for HIV (either positive or negative) and who were attending the sampled VCT centers for follow up (3 months post VCT) were eligible for this study.

Data collection methods

Primary data was collected using a pre-tested self-administered questionnaire designed by the research team to elicit response on demographic variables, sexual risk behaviors, and history of VCT uptake. The survey questionnaire consisted of pre-coded questions, and developed in English, back-and-forth translated in Kiswahili, a language familiar to most Tanzanians. Piloting was done to a convenient sample (n= 15) to check for reliability and validity and minor changes were adapted. The self-administered questionnaire was administered in privacy, under the assistance of two trained research assistants (1 male; 1 female). To ensure confidentiality, the filled questionnaires were put in envelopes; no names were registered to ensure anonymity.

The ethical clearance was sought from Kilimanjaro Christian Medical University College Research and Ethics Review Committee. Permission to conduct the study in the selected sites was obtained from the VCT centers' authorities. Free and voluntary informed written consent was sought from the study participants.

Data Analysis

Data were edited, cleaned, coded, entered and analyzed using Statistical Package for Social Sciences version 12.0.1 (SPSS for Windows: SPSS, Chicago, IL, USA). Descriptive statistics for quantitative variable were estimated and frequencies and percentages were used to present study variables. Probability

values (p-values) were calculated at the 0.05 level of significance, odds ratios (OR), chi squared (χ^2) and 95% confidence intervals (CI) were calculated in bivariate analysis to estimate the statistical differences between dependent and independent variables. To compare the differences of number of sexual partners before and after VCT, ANOVA test to compare two means was calculated.

Measurements

The dependent variable was assessed by asking respondents the number of sexual partners before and after VCT. The variable was later dichotomized into two categories: 1= none/or 1 sexual partner and 2= multiple partners (two partners or more).

The following independent variables were explored:

Demographic variables

Demographic variables include: sex, age, marital status, educational level, and occupation.

Sexual risk behaviors

Participants were asked about the number of lifetime sexual partners; number of sexual partners in the past 3 months, number of casual sexual partners (known less than 1 month) and having sex in the last 3 months prior to the study.

RESULTS

Characteristics of the study participants

A total of 90 participants were involved in this study with 1:1 ratio for males and females respectively. The mean (SD) age of the participants interviewed was 33.5(\pm 9.6) years for both groups (**Table 1**).

Table 1 Characteristics of study participants (n=90)

(n = 90)	Number	%
Age:		
<30	36	40.0
30-39	33	36.7
40+	21	23.3
Sex:		
Male	45	50.0
Female	45	50.0
Marital status:		
Married	31	43.5
Single	41	45.6
Divorce/separated	13	14.4
Widow/widower	5	5.6
Educational level:		
None	3	3.3
Primary	51	56.7
Secondary	21	23.3
Tertiary	15	16.6
Occupation :		
Student	4	4.4
Employed	35	38.9
Self employed	51	56.0

Table 2 presents a summary of reasons for attending VCT services among participants in this study. Overall, 83 (92.2%) of participants perceived that VCT services are beneficial to them (data not shown).

Most of the participants 63 (70%) went for VCT because they wanted to know their status. Pregnancy was the least reason mentioned for attending VCT services in this study (**Table 2**).

Table 2 Reasons for attending HIV counseling and testing

Reasons for VCT*	n	%
To know the status	63	70
I don't believe my partner	26	28.9
I wanted to get married	21	23.3
My partner tested	10	11.1
My fiancé wanted me to do so	7	7.8
I was sick	6	6.7
Pregnancy	3	3.3

*** Participants with yes response**

Overall, 60 (66.7%) participants in this study agreed to have had sexual intercourse in the past 3 months prior to the study. The majority, 73 (81.1%) of participants reported multiple lifetime sexual partners. The mean (SD) number of lifetime sexual partners was 3.8 (\pm 1.3). However, participants reported less number of multiple sexual partners 3 months before VCT. The mean (SD) number of sexual partners was 2.6 (\pm 1.2). Lastly, participants reported less number of sexual partners after VCT. The mean (SD) number of sexual partners was 2.0(\pm 0.7) [data not shown].

As depicted in **Table 3**, there were significant differences in some behavioral factors and number of sexual partners before VCT. Factors associated with number of sexual partners before VCT were: gender, number of lifetime sexual partners and having sex in the past 3 months prior to the study. Males were more likely to report multiple sexual partners compared to their female counterparts. The difference in multiple sexual partners between male and female was statistically significant (OR) = 3.8 [95% CI 1.5- 9.8]; $P < 0.005$). In addition, participants who agreed to have had sex 3 months prior to the study were more likely to have multiple sexual partners compared to those who did not have sex. The difference in multiple sexual partnership between those who had sex and those who did not report sex in the past 3 months was statistically significant (OR) = 3.4 [95% CI 1.3- 8.8]; $p < 0.005$). There were no significant differences between behavioral factors and number of sexual partners after VCT.

The data reveal some significant gender differences in number of sexual partners before VCT: 71 percent of males compared to 29 percent of females, reported multiple sexual partners.

Table 4 describes the mean number of sexual partners before and after VCT by gender. For males' the mean number of lifetime sexual partners before VCT was 1.5 and 1.1 after VCT, which was a significant decrease ($f = 3.6$; $p = 0.014$). Furthermore, the males' mean number of sexual partners in the past 3 months before VCT was 1.5 and 1.1 after VCT, which was a significant decrease ($f = 113.7$; $p = 0.000$). The mean number of those who reported sex in the past 3 months was 1.6 before VCT and 1.1 after VCT, which showed a significant decrease ($f = 5.9$; $p = 0.019$). However, number of casual sexual partners did not show a statistically significant difference between before and after VCT.

For females' the mean number of sexual partners in the past 3 months before VCT was 1.2 and 1.1 after VCT which was a significant decrease ($f = 2.9$; $p = 0.000$). The mean number of casual sexual partners was 1.3 before VCT and 1.1 after VCT, which showed a significant decrease ($f = 4.7$; $p = 0.022$). However, number of lifetime sexual partners and having sex in the past 3 months did not show a statistically significant difference between before and after VCT.

Table 3 Factors associated with number of sexual partners before and after VCT

Variables	Number of sexual partners					
	Before VCT			After VCT		
	≥1 partner (n=59)	Multiple (n=31)	OR[95% CI];p- value	≥1 partner (n=82)	Multiple (n=8)	OR[95% CI];p- value
Gender						
Female	36(61.0)	9(29.0)	1	42(51.2)	3(37.5)	1
Male	23(39.0)	22(71.0)	3.8[1.5; 9.8];0.004*	40(48.8)	5(62.5)	1.7[.39; 7.81]; 0.71
Age group						
< 30 years	22(37.3)	14(45.2)	1	33(40.2)	3(37.5)	1
30-39 years	23(39.0)	10(32.3)	0.68[0.22;2.08]0.45	30(36.6)	3(37.5)	1.0[0.87;1.71]; 0.62
40 and above	14(23.7)	7(22.6)	0.79[0.22;2.78]0.67	19(23.2)	2(25.0)	1.0[0.85;1.20];0.61
Marital status						
Divorced/widow	12(20.3)	6(19.3)	1	16(19.7)	2(25.0)	1
Single	26 (44.1)	15(48.4)	1.15[0.31;4.36]0.81	38(46.2)	3(37.5)	0.96[0.80;1.15];0.48
Married/cohabiting	21(35.6)	10(32.3)	0.95[0.23;3.91] 0.94	28(34.1)	3(37.5)	0.98[0.81;1.20];0.61
Number of lifetime sexual partners						
≥1 partner	15(25.4)	2(6.5)	1	16(19.5)	1(12.5)	1
Multiple sexual partners	44(74.6)	29(93.5)	1.46[1.3;8.8];0.005**	66(80.5)	7(87.5)	1.0[0.90;1.20];0.53
Had sex past 3 months						
No	26(44.1)	4(12.9)	1	29(35.4)	7(87.5)	
Yes	33(55.9)	27(87.1)	3.4[1.3;8.8]; 0.006**	53(64.6)	1(12.5)	.26[.031; 2.22]; .36

** Fisher's exact test for contingency table with an expected cell count of < 5

Table 4 Comparison of risky sexual behaviors before and after VCT by gender

Variables	Male n= 45				Female n= 45			
	Pre-VCT	Post-VCT	f-value	p-value	Pre-VCT	Post-VCT	f-value	p-value
Number of lifetime sexual partners								
mean[SD]	1.5[0.5]	1.1[0.3]	3.6	0.014	1.2[0.4]	1.1[0.3]	0.8	0.5
Numbers of sexual partners in past 3 months								
mean[SD]	1.5[0.5]	1.1[0.3]	113.7	0.000	1.2[0.4]	1.1[0.3]	2.9	0.000
Had sex in the past 3 months								
mean[SD]	1.6 *[0.5]	1.1[0.3]	5.9	0.019	1.2[0.4]	1.1[0.5]	0.1	0.754
Number of casual sexual partners								
mean[SD]	1.6[0.5]	1.1[.332]	0.1	0.864	1.3[0.5]	1.1[0.4]	4.7	0.022

* Respondents with a yes response

DISCUSSION

This study explored the behavior changes which occur after voluntary HIV counseling and testing (VCT) among adults in Moshi Municipality. The key findings of this study are first, VCT significantly contribute to reduction of sexual risk behaviour,

particularly reduction of number of sexual partners, and secondly, gender, practice of multiple sexual partnerships, and being sexual active (i.e. having sex in the past 3 months) have different influence in behaviour change after VCT.

The study findings showed that the most participants went for HIV counseling and testing due to number of reasons. In this study, most participants who attended VCT wanted to know their status. This is in line with findings in other settings, whereby knowing the HIV status is believed to be one of the steps forward in HIV prevention^{5,6,13}. This observation may underscore the importance of national HIV campaigns that have been going on in Tanzania; the Kiswahili slogan used is “*Tanzania bila UKIMWI inawezekana*” [translated in English: Tanzania without HIV is possible¹⁹]. The key message of the VCT campaign emphasizes the importance of knowing ones’ HIV status, so as to adapt risk reduction practices in order to prevent HIV infection. The least mentioned reason for VCT in this study was during pregnancy. This finding is contrary to other studies done in other settings^{2,4,5,8,20}.

This observation maybe due to the fact that most participants were already sexually experienced, and therefore did not feel the importance of testing for HIV during pregnancy. However, this observation calls for renewed emphasize for VCT among pregnant women during pregnancy.

Most participants in this study were sexually active (i.e. having sex in the past 3 months) and also practiced multiple sexual partnerships with a mean of 4 lifetime sexual partners. This finding concurs with studies done in other settings, whereby most sexually active participants had multiple sexual partners. This observation raises concern that sexually active participants in the study area remain at risk of contracting STIs, including HIV^{21,22,23}.

Overall, males in this study were more likely to practice multiple sexual partnerships and may increase the spread of HIV/AIDS in Tanzania²⁴. This practice among males has been attributed to socio-cultural factors and pattern of sexual network whereby in order for men to prove their manhood must practice multiple sexual partnerships, which in turn increases women vulnerability to HIV infection²⁵. This alarming observation calls for efforts to address the practice of multiple sexual partnerships, particularly among males. Participants acknowledged

that VCT was useful to them because counseling sessions were very informative, personal, and touching. Generally, HIV counseling and testing empowers uninfected person to protect him/her self from becoming infected with HIV, assists infected persons to protect others and to live positively^{7,22,26,27}. Existing findings show that counseling, HIV education, risk assessment and personalized risk reduction plan done by the counselor plays an important role in behavior change after VCT²⁷. The implication is if VCT programs are scaled up and if VCT up take will increase more people will adopt risk reduction behavior and hence reduce HIV infection rate^{22,26,27}.

Interestingly, most participants in this study reported reduction of sexual partners after VCT, signifying the importance of VCT in reduction of number of sexual partners and therefore reducing the risk of HIV infection. However, data revealed gender differences in behavioral change of sexual risky behaviors after VCT. Males who reported multiple lifetime sexual partners, multiple sexual partners in the past 3 months and had sex in past 3 months were more likely to report reduction of multiple sexual partners after VCT. For females, having multiple sexual partners in the past 3 months and having casual sexual partners were more likely to report reduction of multiple sexual partners after VCT. This finding is consistence with other studies conducted elsewhere, whereby HIV negative clients decided to change their sexual behavior, such as remain with the same sexual partner, reducing number of sexual partners and abstain in order to remain negative^{8,27}. This important observation underlines the fact that investing in and promoting VCT is worth because VCT has shown to influence behavioral change, particularly reduction in number of sexual partners. In fact, VCT helps the client to set risk reduction strategies to remain negative for HIV negative clients, and to prevent further infection for HIV positive clients^{22,26,27}.

However, the gender differences in behavioral change of sexual risky behavioral after VCT calls for further studies to identify how different sexual risky behavior practices impact on behavioral change.

The study aimed at assessing sexual behavior change after voluntary HIV counseling and testing. The findings have demonstrated that, VCT contributes to behavior change, particularly the reduction of number of sexual partners among participants practicing multiple sexual partnerships. Findings from this study suggest that VCT programs should be promoted and scaled up to cover large population than the current coverage. In fact, there is a need to strengthen the VCT program to improve VCT uptake, which is estimated to be less than 30 % in Tanzania. For effective behavioral change, VCT programs should be specific and designed to target different sexual behaviors practices for both males as well as females.

STUDY LIMITATIONS

This study has limitations. First, some respondents may have found study questions too personal to disclose some important information especially related to sexual behavior. Secondly, the study sample was small thus may affect the external reliability and the findings cannot be generalized to the whole Tanzanian population.

Lastly, social desirability bias may affect participant's responses, particularly among males. Studies on

sexuality have reported the possibility of over reporting of sexual activities among male respondents.

CONCLUSION

Importantly, the study findings indicate that VCT has a potential to influence behavioral change, particularly reduction of sexual partners. Efforts are warranted to motivate sexually active people to engage in VCT services and further studies are necessary in order to understand the effectiveness of VCT intervention in changing sexual behavior in similar settings in Tanzania.

AUTHORS' CONTRIBUTIONS

BK, DM and MM analyzed data interpreted results and drafted the manuscript. BK participated in data collection and DM supervised data collection. BK, MM and DM participated in data analysis. MVM, BN, DM and JK contributed to the interpretation of results and drafting of the manuscript. All authors read and approved the final version of the manuscript.

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