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Determinants of Healthcare Workers' Uptake of Voluntary Counseling and Testing for HIV/AIDS at Meru Teaching and Referral Hospital, Kenya

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Authors' contributions

This work was carried out in collaboration among all authors. Authors WMM, JGK and AOO came up with the concept and they designed the study. Author WMM collected data. Authors WMM and SO conducted the analysis. Author WMM drafted the manuscript. Authors JGK and AOO revised the manuscript. All authors read and approved the final manuscript.

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ABSTRACT

Aim: To establish determinants to the uptake of VCT services among the healthcare workers at Meru Teaching and Referral Hospital, Kenya.
Methods: A descriptive, cross-sectional study was conducted among 193 participants selected through stratified random sampling. Data were collected using a semi-structured questionnaire and analyzed using SPSS version 21. Results were presented using frequency distribution tables, with statistical significance set at $p<0.05$.

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Results: There was a high level of uptake of VCT services among the healthcare workers, at 97.9%. Age of the participants had a significant influence (*P* = .042). Gender (*P* = .062), profession (*P* = .15), education (*P* = .12), and marital status (*P* = .11) had little or no influence. 100% of the participants recorded to be knowledgeable on modes and methods of HIV prevention and transmission. Knowledge of sexual contact in the transmission and spread of HIV virus proved to be statistically significant (*P* = .000). The factors highlighted as barriers in this study were found to have less impact in hindering the participation in VCT services.
The moderation effect between variables was assessed using the Andrew F. Hayes and confirmed that, availability of guidelines for exposed participants and post-exposure prevention did not moderate the demographic factors, (*P* = .07). However, the administration's role encouraging the healthcare workers to HIV testing increased the significance of demographic factors. (*P*=.03).
Conclusion: There was a high level of uptake of VCT services, knowledge on the modes of transmission and prevention of HIV virus among the healthcare providers. Government policies and institutional guidelines on HIV VCT protocols, medical ethics and consistent efforts are needed to promote the uptake of VCT services among the healthcare workers.

Keywords: Healthcare workers; HIV/AIDs; uptake; VCT uptake; determinants.

ABBREVIATIONS

VCT : Voluntary counselling and testing
HIV : Human Immune Virus
AIDS : Acquired immune deficiency syndrome
HCW : Health care worker
UNAIDs : United Nations Aids.
NASCOP : National Aids & STI Control Programme.
CD 4 : Cluster of Differentiation 4

1. INTRODUCTION

The HIV infection in humans is a virus that first results in the disease known as AIDS (NACC & NASCOP, 2012b; Meissner et al., 2022; Kahn & Walker, 1998). HIV attacks the immune system and weakens it that exposes individual to opportunist infection. HIV can be classified in the groups of viruses that are called retroviruses. These viruses infect human cell and utilize the nutrients and energy in the body which makes then grow and reproduce. HIV infects and destroys CD4+ cells (NACC & NASCOP, 2012b; Meissner et al., 2022; Kahn & Walker, 1998).

HIV/AIDS is a deadly pandemic that has mostly devastated underdeveloped nations over the last two decades. It was declared an emergency by many governments in these developing countries. Since the AIDS pandemic's inception in the early 1980s, an estimated 38.1 million individuals had the virus by the year 2021 (UNAIDS, 2021). The virus that causes AIDS may spread in a number of different ways. Transmission may occur from mother to child via pregnancy and breast-feeding, or through sexual encounter with an infected individual (UNAIDS, 2016a; UNAIDS, 2016b; UNAIDS, 2016d).

VCT, or voluntary counseling and testing, is an effective method of illness prevention (Were et al., 2003).

In Africa, VCT is an important tool for reducing the spread of HIV (Were et al., 2003). One tactic is education, but studies show that knowing one's HIV status motivates greater proactive behavior among people and can adjust their behavior accordingly (Costa et al., 2022). Health care providers should know their HIV status for the same reasons that the general public should: so that they can alter their behavior and engage in safe sex, gain access to care and support, serve as role models in the support and care of the sick, and lead the charge in advocating for HIV/AIDS awareness and suppression (Miller & Rubin, 2007; King et al., 2008).

Rates of HIV infection in Cameroonian health care professionals was recently established in a research was 4.20% with accidental expose to blood being the highest contributing factor (Domkam et al., 2018). Health care workers are considered a high-risk group when it comes to HIV infection (Bell, 1997; Gerberding, 1995). The disease and its complications continue to be the leading cause of death. Thus, the introduction of programs specifically designed to assist HIV/AIDS among health care professionals is urgently required. VCT is a vital part of HIV-prevention strategies. Changing people's habits is the primary focus of these facilities. According

to research in other countries and in Kenya, when people are aware of their standing, they are more likely to alter their actions for the better. In order to avoid contracting an illness or an opportunistic infection, individuals need to be conscious of their situation. When used in conjunction with other preventative strategies, VCT opens the door to treatment and assistance for individuals who test positive. It provides the people with the means to learn about and comprehend their HIV status. The goal of the intervention is risk mitigation, not risk elimination (Costa et al., 2022).

In 1999, AIDS was recognized as a national crisis in Kenya. The initiative advocated for HIV testing and counseling as a kind of preventative medicine. With a total population of 1,455,850, Meru County has a 3.6% HIV prevalence (KENPHIA, 2018). Approximately 1.34 million Kenyans are HIV-positive, or 4.8% of the population, according to the National Aids Control Council Report 2021.

2. METHODOLOGY

2.1 Research Design

Cross-sectional, descriptive study design incorporating use of quantitative methods was employed in collecting and analyzing data. The research design was considered effective since it tested and quantified the association between independent variables and the uptake of VCT services and also established the level of uptake of VCT services among HCW.

2.2 Study Location

The research was conducted at Meru County's Teaching and Referral Hospital, Imenti North Sub County. It is Located towards the Northeastern slopes of Mount Kenya, precisely 37.649803 degrees east and 0.047035 degrees north. The counties of Isiolo, Tharaka-Nithi, Nyeri, and Laikipia are located to the north, east, southwest, and west, respectively. The facility provided the study participants.

2.3 Sample Size

A total of 193 HCW stratified as per cadre respondents were interviewed for quantitative data using simple structured closed and open ended questionnaires.

2.4 Target Population

This research targeted all HCW comprising Nurses, clinical officers, medical physicians, laboratory officials, pharmacist, and HTS providers (male and female) at Meru Teaching and Referral Hospital who met the inclusion requirements and provided their consent.

2.5 Sampling Strategy

Meru Teaching and Referral Hospital, in particular, was purposively selected because of the high rise in HIV prevalence of (3.6%) (KENPHIA, 2018) and because it is the central hospital in the region with a high number of health care workers respectively, where most of HIV infected population seeks comprehensive care center services. Participants were recruited using a stratified sample strategy that accounted for differences in the healthcare worker cadre. Each stratum's sample was drawn proportionately from the various categories of healthcare professionals. Respondents were chosen at random from each stratum.

2.6 Data Collection Methods and Procedures

A pre tested structured questionnaire subdivided into sections was administered to study participants to collect and maintain quantitative reliable data.; Social demographic factors including ages, sexes, religions, marital statuses, and educational backgrounds was collected. Level of VCT uptake data was gathered on how often respondents got tested before the study was done. Information collected on healthcare workers knowledge on HIV/AIDs comprised HIV education on prevention strategies, mode of transmission among the respondents and other study variables. Information gathered on barriers to VCT services focused on availability of ARVs, risk of HIV infection, confidentiality, stigma and discrimination and fear of positive results among the respondents as the variables. Careful selection and training on questionnaire administration, confidentiality, and medical/research ethics were provided to research assistants. Eligible participants were asked for consent. Confidentiality in this study was protected by assigning a unique identification number to each participant.

2.7 Data Analysis and Presentation

Data collected from surveys was verified for accuracy before any analysis was performed to

account for outliers, inconsistencies, and missing data. Then, data was run via SPSS version 21 for analysis. Quantifiable category data was described using frequencies, percentages, and numbers. Numbers were summarized using means and standard deviations. The chi-square test was used to check for a relationship between the explanatory and response variables at a significance level of 95% (p-value 0.05). All significant values identified by bivariate analysis with a 95% confidence interval underwent Binary logistic regression to find further correlations and to control confounders across variables. Determinants on uptake of VCT service was presented using tables and its follow-up questions were presented using frequency tables. Both Socio-demographic data and barriers was presented using frequency tables.

3. RESULTS

3.1 Level of Uptake of VCT Services

The research activity was successful, judging from the questionnaire return rate. Out of the 193 copies of questionnaires administered, 189 were successfully filled and returned translating to a response rate of 97.93%. As shown in Table 1, some indicators used to measure the uptake of VCT services included having tested for HIV, the frequency of testing for HIV annually, factors leading to the decision to take the test, and recommendations to others. The level of uptake of VCT services among the healthcare workers was 97.9%. The findings revealed that healthcare workers at Meru Teaching and Referral Hospital, majority attended VCT testing services to know their HIV status. Respondents who agreed to have tested for HIV at the VCT were represented by 97.9%, while those who had not gone for an HIV test were represented by 2.1% and were the minority.

3.2 Socio-demographic Factors and Uptake of VCT Services

The demographic factors assessed among the HCW comprised of the gender of respondents, age, profession, marital status, and level of education. In Table 2, in terms of gender, male healthcare workers dominated. In professionally, it was evident that nurses were the most healthcare workers while Medical doctors were minority. Diploma was the most attained level among the healthcare workers than any other while Higher diploma was the least attained. This implies that the majority of the healthcare workers have attended college and have Knowledge regarding their profession and VCT concerning HIV/AIDS disease. Regarding age distribution, the modal class was between 21 and 30 years. Respondents aged between 21 and 30 years was the highest and healthcare workers aged between 31 and 40 was moderate. Senior healthcare workers aged between 41 and 50 years were least represented. This means that the healthcare workers in the study are mature and understand VCT services and their dockets. In terms of marital status, the results indicated that single healthcare workers were the majority, married healthcare workers were moderately represented.

3.3 Relationship between Demographic Characteristics and Uptake of VCT services, Binary Logistic Regression

The findings in Table 3 indicate that the model was statistically significant in predicting the influence of demographic factors on the uptake of VCT services among HCW [Wald=57.556, P = 0.000]. The proportion of the model explained by the variables is 52.1%, R-square = 0.521. From the individual significance, gender (P= 0.062), profession (P= 0.158), education (P= 0.122), and marital status (P-value = 0.11) do not have an influence on the uptake of VCT services among the health workers at Meru Teaching and Referral Hospital. However, the age of the healthcare workers was however found to have an influence on uptake of VCT services.

3.4 HIV/AIDS Knowledge of the Healthcare Workers

As indicated in Table 4, the level of knowledge among the healthcare workers at the facility was measured by their participation on HIV education program, and how much informed they are with HIV protective and prevention measures. All the healthcare professionals, 100%, at the hospitals responded to have participated in the HIV education program. The findings revealed that the majority of healthcare workers don't believe that HIV/AIDS is hereditary, while only a few agree that HIV/AIDS is hereditary. It was found that use of female condoms during sexual intercourse with an infected person reduces the risk of HIV transmission at 99.5% among the

women. It was also found that sharing infected needles, and scissors may spread HIV and other AIDS viruses at 99.5%. Further, most of the participants agreed that VCT is crucial to stop the transmission of HIV. In terms of the HIV education program, the majority of the healthcare workers at the hospital agreed to take part in the HIV education program, representing 66.7%. In comparison, 33.3% did not take part in an HIV education program before this study. The most prevalent route for transmission of HIV was through sexual intercourse, 97.4%. At the same time, most of the participants preferred using condoms, 92.1%, as a means of preventing contracting HIV than any other protective measure.

3.5 Relationship between Knowledge of HIV/AIDS and Uptake of VCT Service. Binary Logistic Regression

As indicated in Table 5, the results reveal that the variables explained 54.7% of the model, the Knowledge of HIV/AIDS, R-square = 0.547. The model sufficiently explains the significant influence of Knowledge of HIV/AIDS on the uptake of VCT services symbolized by Wald statistic value, 57.556, p= 0.000. The individual significance of the variables indicating the Knowledge of sexual contact and sexual behavior was found to have a negative influence on the uptake of VCT services. Moreover, the knowledge of sexual contact in the transmission and spread of HIV virus was found to be statistically significant in predicting uptake of VCT services at (p= 0.000).

3.6 Barriers to Accessibility of VCT Services

As indicated in Table 6 the findings shows that factors highlighted as barriers have less or no impact in hindering the uptake of VCT services but rather influence the uptake of VCT services among healthcare providers at Meru Teaching and Referral Hospital. Fear of stigma and discrimination shown to be the common barrier to VCT uptake among health care workers.

Table 1. Frequency distribution of the level of uptake of VCT services

Category	Frequency	Percentage
Tested for HIV		
Yes	185	97.9
No	4	2.1
Often test for HIV		
Once	70	37.0
Two times	40	21.2
Three times	41	21.7
Severally	26	13.8
I can't remember	12	6.3
Reason for HIV test		
Persuaded by friends/relative/partner	9	4.8
Initiated by healthcare provider	8	4.2
Fulfilling a requirement	18	9.5
To know my HIV status	149	78.8
Prepare my future	5	2.6
Recent screening		
less than or 3 months ago	92	48.7
less than or 6 months ago	42	22.2
less than or 1 year ago	33	17.5
less than or 2 years ago	4	2.1
more than or 2 years ago	18	9.5
Suggest VCT testing to others		
Yes	160	84.7
No	29	15.3

Table 2. Social-demographic characteristics of healthcare workers

Category	Frequency (N)	Percentage
Gender		
Male	102	54.0
Female	87	46.0
Profession		
Nurse	92	48.67
Doctor	8	4.2
Pharmacist/tech	20	10.6
Lab tech	30	15.9
Clinician	39	20.63
Education		
Diploma	118	62.4
Higher diploma	5	2.6
Degree	66	34.9
Age		
21-30 years	90	47.6
31-40 years	57	30.2
41-50 years	12	6.3
51-60 years	30	15.9
Marital Status		
Single	96	50.8
Married	75	39.7
Engaged	4	2.1
In a relationship	14	7.4

Table 3. Relationship between demographic factors and uptake of VCT services

Parameters	Value	
-2 Log likelihood	19.557	
R-square (Nagelkerke)	0.521	
Overall significance	57.556 (0.000)**	
Variables	**Wald**	**Sig.**
Gender	-18.745	0.062
Profession	8.781	0.158
Age	-15.394	0.042
Education	1.065	0.122
Marital Status	-15.954	0.113

Table 4. Frequency distribution for knowledge of HIV/AIDS factors

Category	Frequency	Percentage (%)
HIV is hereditary		
True	6	3.2
False	183	96.8
Cure		
False	189	100.0
Sexual contact with infected person the only cause of HIV		
True	26	13.8
False	163	86.2
ARVs increase lifespan		
True	188	99.5
False	1	0.5
Treatment of HIV is provided at no cost		
True	178	94.18
False	11	5.82
Protective gear should be won when dealing with bodily fluids of contaminated person		
True	108	57.14
False	81	42.86

Category	Frequency	Percentage (%)
Women reduce risk by using female condom		
True	180	95.2
False	9	4.8
Sex with several partners increases risk for HIV		
True	111	58.73
False	78	41.27
Infected needles		
True	188	99.5
False	1	0.5
VCT is crucial to stop transmission		
True	161	85.2
False	28	14.8
HIV Education program		
Yes	126	66.7
No	63	33.3
Policy regarding HIV/AIDS		
Yes	171	90.5
No	18	9.5
HIV education		
Yes	189	100.0
Worried about contracting HIV/AIDS		
Very concerned	139	73.54
Not concerned	50	26.46
Infection route for HIV		
Sexual intercourse	184	97.4
Blood transfusion	5	2.6
Protection from HIV		
Use condom	174	92.1
avoid sex with prostitutes	5	2.6
stick to one sexual partner	5	2.6
abstain	5	2.6

Table 5. Relationship between knowledge of HIV/AIDS transmission, prevention and uptake of VCT binary logistic regression

Parameter estimates		
-2 Log likelihood	18.555	
R-square (Nagelkerke)	0.547	
Overall Significance	**57.556 (0.000) ****	
Variables	**Wald**	**Sig.**
Hereditary	0.136	0.714
Sexual Contact	-5.133	0.000**
ARVs	0.172	0.883
Treatment provided	-0.062	0.883
Protective gear	-0.144	0.883
Reduce risk	-1.662	0.883
Risk of many sex partners	0.015	0.883
Infected needles	-0.098	0.883
VCT importance	0.403	0.399
Education program	-0.291	0.153
Policy	-0.062	0.512
Worried	-0.144	0.883
Infection	-1.662	0.739
Protection	0.015	0.611

*** represent significance at 0.05 level*

Table 6. Frequency distribution of barriers to accessibility of VCT services

Category	Frequency	Percentage
Test in last 3 months		
Yes	105	55.6
No	84	44.4
Why Health professionals not attending VCT		
Service personnel lack confidentiality	42	22.2
Fear of stigma and discrimination	104	55.0
Fear of positive results	24	12.7
No risk to HIV infection	14	7.4
Fear to be seen at VCT centers	5	2.6
Safety Equipment stock		
Adequate	169	89.4
Inadequate	20	10.6
Religious beliefs		
Yes	42	22.2
No	147	77.8
Marital Partner		
Encourage	152	80.4
Discourage	37	19.6

4. DISCUSSION

Participation in VCT (Voluntary Counselling and Testing) programmes as reported by healthcare workers can vary depending on a range of factors. Whether or not VCT services are easily accessible within healthcare facilities can impact healthcare workers' uptake. If VCT services are readily available on-site, healthcare workers may be more likely to utilize them (Federal Ministry of Health, 2018; World Health Organization, 2019). The CDC recommends HIV testing should be conducted annually (Centers for Disease Control and Prevention, 2022). A large percentage of individuals was tested for HIV every year, therefore the research follows CDC guidelines. Because of their deep understanding of VCT services, healthcare staff exhibited a significant preference for VCT. Considerations such as age, education, sexual activity, stigma, and fear of HIV test results were the most important in determining whether or not to undergo VCT. If we want more healthcare personnel to choose VCT and less stigma, we must stress the significance of providing support and post-test care. Curiously, the research proves that healthcare workers had a very high rate of VCT uptake, disproves the results of the research of Charles et al. (2009) demonstrating that healthcare professional students in Tanzania's Kilimanjaro area have poor VCT service acceptance despite strong knowledge and readiness to test. In this study, the healthcare workers were mostly single (not in a relationship) despite having encountered a sexual life and understanding of the spread of HIV and the importance of VCT testing. Married couples have a higher chance of contracting HIV than single/non-married or divorced or widowed individuals due to sexual activeness (Boileau et al., 2009). But due to fear of positive results single individuals tend to go for screening to know their status as revealed in this study.In terms of gender, HIV infection is more likely to affect women than males therefore they undergo series of HIV screening to keep them safe from the virus (UNAIDS, 2017; Wang et al., 2016; Joint United Nations Programme on HIV/AIDS, 2017). Women of the child bearing age are subjected to PMTCT. Despite having more male healthcare professionals than women in the facility from the findings, there was still reluctance on the male healthcare professionals to undergo VCT compared to their female counterparts. Some argued that they relied on the test results of their spouses which gave them enough confidence about their status. Similarly, DiCarlo et al. (2014) revealed that women in Lesotho had easier access to testing, but males had irrational fears about it. In regards to age, this study revealed that most of the health care workers ranged in age from twenty-one to forty-five. The senior healthcare workers were few at Meru Teaching and Referral Hospital having attained a retirement age and some being on leave during the onset of the study. It was clear that the junior healthcare workers highly participated in the VCT services utilization than the older healthcare workers due to the proportionality of age, for instance, and having high risk of contracting HIV virus. There was a favourable correlation between age and VCT

uptake, according to the research corresponding to a study of 192 undergraduates from Khartoum University's science department participated in the study (Abdalla & Abusalih, 2021) Healthcare workers are very eager to test and are aware of VCT services at Meru Teaching and Referral Hospital, and its uptake is high. The respondents in this research displayed their knowledge on HIV/AIDS modes of transmission and prevention strategies against contracting the virus in the line of duty. All participants were medical experts, and most of them had prior knowledge and experience with VCT. According to a study done on acceptability and viewpoint towards VCT among young healthcare professionals in the Kilimanjaro region, Tanzania, their findings were in line with ours (Charles et al., 2009). The benefits of VCT include modifying behavior, getting help and treatment for individuals who are infected quickly, preparing for the future while minimizing risks, and many more were emphasized by healthcare providers to have motivated them to undergo VCT testing. Due to the lack of a clear association, this shows how complex the relationship is between awareness and knowledge and other behavioural components. However, previous research has shown that having a lot of knowledge does not automatically result in more people using VCT services (Kuehne et al., 2018). These results counter to what this research found. Several obstacles exist throughout the health system, according to this study's findings. Fear of discrimination, stigma, and a lack of secrecy were mentioned by many individuals as concerns. For example, when medical professionals doing testing and counseling did not have the necessary expertise or did not follow ethical guidelines. Consistent with these results, Teklehaimanot et al. (2016) found that participants in rural Ethiopia were less prepared to undergo VCT testing due to stigmatization, fear of positive results, and difficulty accessing VCT centres, among other factors. For others, their self-perceived risk of HIV infection as a result of practicing high-risk sexual behavior was the motivating factor for seeking VCT services. These findings concur with the reports of the National Agency for the Control of AIDS (2015); that uptake of VCT services is highly influenced by an individual's perception of the risk of being infected. Therefore, while Knowledge is essential for decision-making, other factors are more critical in influencing a person's behavior and subsequent uptake of VCT services despite their professional setup.

5. CONCLUSION

This study concluded that uptake of VCT services to be high among the female healthcare workers than males. There is a need to increase the uptake of VCT among the male healthcare workers through health promotion and sensitization. It was also established that various determinants assessed in this study directly influenced the uptake of VCT services among the Healthcare workers. Government and institutional policies that prioritizes the availability and accessibility of VCT services, were found to encourage more healthcare professionals to seek testing. Policies that make HIV testing services free or low-cost can remove financial barriers and make testing more accessible to a wider range of individuals. Confidentiality of HIV test results can help alleviate fears of stigma and discrimination, making healthcare professionals more likely to seek testing.

ETHICAL APPROVAL AND CONSENT

The study was approved by Mount Kenya (MKU) Institutional Research Ethics and Review Committee (IREC) of reference number MKU/ISERC/2961. Permit to carry out the study was provided by National Commission for Science, Technology, and Innovation (NACOSTI) of license number NACOSTI/P/23/28313. Legal documents required to conduct the research were sought from the county government of Meru. Respondents' participation was purely voluntary and the investigator requested participants to sign informed written consent. The anonymity of the participants was maintained as only identification numbers and no identifiers were used.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of this manuscript.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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