

*East African Medical Journal Vol. 93 No. 2 February 2016*

PREDICTORS OF HIV SELF-TESTING AMONG HEALTH WORKERS AT NYERI PROVINCIAL HOSPITAL IN KENYA  
J. K. Muthoka, MPH Graduate, Department of Health Studies, University of South Africa, Technical Advisor - HIV prevention, Centre for Health Solutions – Kenya and H. Du Toit, Lecturer, Department of Health Studies, University of South Africa (UNISA), P. O. Box 392, Unisa

Request for reprint to: J. K. Muthoka, MPH Graduate, Department of Health Studies, University of South Africa, Technical Advisor - HIV prevention, Centre for Health Solutions – Kenya

## PREDICTORS OF HIV SELF-TESTING AMONG HEALTH WORKERS AT NYERI PROVINCIAL HOSPITAL IN KENYA

J. K. MUTHOKA and H. DU TOIT

### ABSTRACT

**Background:** HIV self-testing is recognised as a possible option of expanding access to HIV testing and counselling (HTC). There is high demand for self-testing among health workers. However, in many health facilities in Kenya, the rate of unregulated self-testing and factors influencing the practice remain unknown.

**Objectives:** To determine the prevalence and factors influencing HIV self-testing among health workers

**Design:** A descriptive cross-sectional study.

**Setting:** Nyeri Provincial Hospital, the largest public hospital in Central Kenya.

**Subjects:** Four hundred and fourteen Health workers at Nyeri Provincial Hospital who included the following cadres: Nurses, Doctors, Clinical officers, Laboratory Technicians, Community Health Workers and HTC counsellors.

**Results:** The proportion of self-testers were 65.8% (N=348). The significant predictors of HIV self-testing were identified as age, difficulty of conducting HIV self-test, reliability of HIV self-test results and confidence in HIV positive self-test results.

Self-testers (n=229) identified factors that influenced them to self-test as: easy access to test kits, obligation to test themselves, saves time and fear of stigma. Non self-testers (n=119) identified inability to handle HIV positive results; idea of self-test scares me, fear of stigma and lack of access to test kits as factors inhibiting self-testing.

**Conclusions:** Self-testing is highly practiced by health workers at Nyeri provincial hospital. HIV related stigma needs to be addressed. Increasing access to test kits may increase self-testing.

### INTRODUCTION

Self-testing is recognised as a possible option of expanding access to testing for HIV (1). In this study, HIV self-testing refers to health workers collecting their own blood samples and performing a simple rapid HIV test to detect the presence or absence of HIV antibodies within themselves. The World Health Organisation (WHO) reports global high interest in HIV self-testing and a high practice among health workers but notes that the practice is unregulated (2). A Kenyan study showed that there is a high demand for self-testing among hospital based health workers and that it provided more privacy than other models of testing (3). Studies have shown that self-testing using approved test kits yield highly accurate results besides having high acceptability rates among users (4). In most health facilities in Kenya, health workers undertake self-testing using approved rapid test-kits that use blood samples.

Health workers usually know where to gain access to HIV testing, as the majority of the facilities where they work provide these services. However, health workers involved in HIV issues are reluctant to seek testing at the facility with fears on confidentiality and stigmatisation within their health services being cited as inhibiting factors (2). As a result, informal self-testing becomes the preferred option and is usually carried out in secrecy and may be associated with several limitations including inaccurate results, unsafe disposal of sharps waste, limited access to psychosocial support and poor referral and linkage to care and treatment (2,5).

There has been some advocacy for increased access to self-testing (2). However, opponents of this method point out that testing is not sufficient without pre- and post-test counselling which may not be readily available for clients undertaking self-testing (1,5,6). Telephone counseling has been identified as a safe and effective substitute to face-to-

face counselling. This may not however be feasible in developing countries and especially rural areas where access to telephones is limited (6). The risk of coercion arises with several self-tests and some opponents of HIV self-testing argue that this could be the case in HIV self-tests (1). Opponents also raise the fear that the results of self-tests could be inaccurate and therefore, self-tests should not be made available to the public (1,5,7). It is important to link HIV positive clients to care and to confirm preliminary results with the aim of starting treatment. Knowledge of HIV status may not automatically lead to access to care. Furthermore, the emphasis on privacy may in retrospect increase the social stigma associated with HIV infection (6). The current approaches for testing have a weakness in linkage to treatment and care and self-testing may exacerbate the weakness (5,7,8).

Proponents of self-testing argue that it is a quick and cost effective method for HIV diagnosis (6). Some believe that the legal and policy framework should be amended with specific provisions on self-testing; in addition the information sheet in the test kits should be tailored to include simple and relevant information such as window period, need for a confirmatory test of a positive result and a toll-free help line for counseling and assistance (1). Studies showed that HIV test kits are easily available to health workers and are widely used (9). However, from all reviewed literature there was no study that had covered the predictors of HIV self-testing among health workers. This study looked at the prevalence and the predictors of HIV self-testing among health workers in Nyeri provincial hospital.

To establish the predictors of HIV self-testing among health workers, a questionnaire was developed based on the concepts of the PMT. The PMT was developed by Rogers as an expansion of the Health Belief Model, with additional factors (10,11). The PMT postulates that health related behaviour is a product of several components organised along two processes: threat appraisal and coping appraisal (12,13). The components which predict people's health behaviour are identified in Roger's model and later revisions of the model as perceived severity, perceived vulnerability, response efficacy and self efficacy. The model facilitates the adoption of protective behaviour and is best measured by behaviour intentions (14). Protection motivation in this study was the result of evaluation of perceived vulnerability and severity of HIV infection (threat appraisal), and an individual's ability to perform a HIV self-test successfully and their belief that the HIV self-test will accurately detect HIV infection (coping appraisal). The result would be either an adaptive response, like accepting the HIV self-test result, or a maladaptive response, like rejecting the HIV self-test result.

The aim of the study was to describe the reasons for and the practice of HIV self testing among

health workers in Nyeri provincial hospital, Kenya, the predictors of self –testing, the relevance and usefulness of the PMT model.

## MATERIALS AND METHODS

*Study design and setting:* This was a descriptive cross-sectional study, carried out in Nyeri provincial hospital, Kenya, which is the largest public hospital in the Central province, Kenya.

Due to the high number of different cadres of health workers, the hospital was most suitable for this study. The different cadres of staff included were Nurses, Doctors, Clinical officers, Laboratory Technicians, Social workers and HTC counsellors. The study population was small and thus the researcher carried out a census that included the entire target population. The total number of health workers was 414. The study therefore did not involve sampling. The inclusion criteria for this study were all health workers, as mentioned above, on duty during the three weeks of data collection. The exclusion criteria included the cadres of health workers not directly and/or routinely involved in HIV service delivery. These cadres of health workers included Mortuary attendants, Students, Trainees, Dentists, porters, occupational therapists, Physiotherapists, and subordinate staffs among others.

*Data collection and procedures:* A questionnaire with closed ended questions guided by the concepts in the PMT was developed. Pre-testing of the questionnaire was done with ten health workers from another health facility, who met the inclusion criteria, but were not part of the study sample. The questionnaires were administered to the health workers by three research assistants. The research assistants were trained on questionnaire administration and their roles were to distribute and collect the questionnaires and clarify instructions if necessary. They distributed the questionnaires in the hospital for a period of three weeks, between 1st July and 22nd July 2012.

*Data analysis:* Data analysis was done using the computer package Statistical Package for the Social Sciences (SPSS) version 16.0. An alpha of 0.05 was used for statistical significance. Initially, basic descriptive statistics were used to describe the respondents' socio-demographic characteristics. Binary logistic regression analysis was conducted to determine the predictors of HIV self-testing. Chi squares were calculated through cross tabulations to determine the relationships between different variables.

*Ethical considerations:* Ethical clearance for the study was given by Health Studies Higher Degrees Committee, College of Human Sciences, University of South Africa (UNISA) after reviewing the study

proposal. The Medical Superintendent, Nyeri provincial hospital gave a written institutional approval to conduct the study. All respondents signed an informed consent form. To maintain confidentiality, the questionnaires were coded and names of the respondents were not recorded on the questionnaires. Considering the stigma associated with HIV, it was anticipated that participating respondents may experience psychological discomfort or harm. Respondents were made aware of the availability of individual counselling and comprehensive HIV care services arranged for those who would like to make use of it during any stage of the research.

## RESULTS

*Respondents' characteristics:* Of the total 414 health workers in the hospital, 358 responded. Ten questionnaires were spoilt as some respondents answered all three sections contrary to instructions and thus 348 were included in the analysis. Female health workers accounted for 62.4% (N=348) of the respondents. Most respondents were aged between 25-29 years (27.3%, N=348) with a range of 20 to 55 years.

Only 0.6% (N=348) of the respondents had secondary education with the rest having a higher qualification. The majority (69.3%, N=348) of the respondents had a college education. Nurses accounted for the highest professional group with 79.6% (N=348) while Doctors accounted for 5.5%. Other cadres included HTC counsellors (2.9%), clinical officers (4.9%), Laboratory technicians (5.7%) and Social workers (1.1%). Among the 348 respondents, 46.6% were married, 39.9% single, 8.3% separated, 3.4% divorced and 1.7% were windowed. Of the 348 respondents, 65.8% had practiced HIV self-testing.

*Demographic factors:* Age was a significant predictor of HIV self-testing. Respondents aged 30-34 were 1.777 times more likely to self-test and those aged 40-44 were 1.581 times more likely to self-test than respondents aged 20-24 years. However, in those aged 45 and above, the likelihood of self-test use decreased with increasing age. All the other demographic factors namely education level, profession, marital status and gender were not significant predictors of HIV self-testing.

*Perceived vulnerability:* The results showed the perception of vulnerability in regards to the chances that the individual could become HIV infected was not a significant predictor of HIV self-test use ( $p > 0.05$ ). The perception of vulnerability in regards to comparing self to others of the same age and gender, was also not a significant predictor of self-test use ( $p > 0.05$ ).

*Perceived severity:* The findings showed the perception of severity was not a significant predictor of self-test use among the respondents.

*Perceived self-efficacy:* The results showed that HIV self-testers had a higher level of self-efficacy ( $p < 0.05$ ) when compared to non self-testers. Self-testers were more likely to disagree with the statement that 'performing HIV self-test is difficult'. Those who disagreed with this statement were 26.5 times more likely to self-test than those who agreed with the same statement. The ability to confidently interpret the test result without professional assistance was not a significant predictor of self-test use of HIV among the respondents.

*Perceived response efficacy:* The study showed that perceived reliability of self-test results was a significant predictor of HIV self-testing ( $p < 0.05$ ). HIV self-testers were more likely to agree with the statement that 'the result of HIV self-test is reliable'. Those who disagreed with this statement were 0.052 times less likely to self-test while those who were not sure were 0.063 times less likely to self-test compared to those who agreed with the statement.

The confidence in normal self-test results (being HIV negative) was not significant ( $p > 0.05$ ) as a predictor of HIV self-test use. However, confidence in abnormal self-test results (HIV positive) was a significant predictor of HIV self-test use ( $p < 0.05$ ). HIV self-testers had more confidence ( $p < 0.05$ ) in the accuracy of abnormal results (being HIV positive) than non self-testers. Those who had no confidence in the accuracy of HIV positive results were 0.225 times less likely to self-test compared to those who had confidence in the accuracy of HIV positive results.

*Anticipated regret:* Anticipated regret was not a significant predictor of HIV self-testing. Self-testers and non self-testers were indifferent to anticipated regret if they did not perform HIV self-test and they subsequently turned out to be HIV infected.

*Privacy:* The need for privacy as an important factor in HIV self-testing was not statistically significant as a potential benefit that would predict HIV self-test use among the health workers in Nyeri provincial hospital.

*Factors influencing HIV self-testing among self-testers:* Self-testers identified the following as factors that may have influenced them to practice HIV self-testing; easy access to HIV test kits (63.8%, n=229); obligation to test themselves for HIV (36.7%, n=229); HIV self-test saves time (31.4%, n=229); fear of stigma (28.8%, n=229); intimidation by a partner (14.0%, n=229); lack of knowledge on where to get tested for HIV (3.5%, n=229) and self-exposure to needle prick at work (0.9%, n=229).

*Factors inhibiting HIV self-testing among non self-testers:* Non self-testers identified the following as factors that may have inhibited them from practicing HIV self-testing; not feeling able to handle a possible HIV positive result (60.5%, n=119), being scared of doing a self test (41.2%, n=119), fear of stigma (38.7%, n=119), lack of access of test kits (10.1%, n=119), lack of knowledge about HIV (6.7%, n=119), and other factors (5.0%, n=119). Other factors included fear of the unknown, especially if they turned to be HIV infected, others felt it was unethical to practice self-testing and some felt there were people trained to do HIV testing and thus there was no need to self-test.

## DISCUSSION

The findings of this study indicated that many health workers had practiced HIV self-testing; making these findings consistent with existing literature from the WHO (2) and a study of feasibility of HIV self-testing among health workers in Kenya (3).

The age of respondents was the only demographic factor that significantly influenced the practice of self-testing. These findings are somewhat consistent with the findings of a Dutch cross-sectional survey of the psychosocial determinants of self-testing cholesterol, glucose and HIV (9) identifying gender as a non predictor of HIV self-testing.

A literature review and the theoretical framework, PMT, helped to identify factors that may predict the practice of HIV self-testing. These were described as perceived vulnerability, perceived severity, perceived self efficacy and perceived response efficacy among others. The perception of vulnerability with regards to the chances that the individuals could become HIV infected was not a significant predictor of HIV self-test use. Similarly, the perception of vulnerability with regards to comparing self to others of the same age and gender was also not a significant predictor of self-test use. These findings are in contrast to findings of the Dutch study that found perception of vulnerability being higher among HIV self-testers when compared to non self-testers (9).

The perception of severity was not a significant predictor of self-test use among the respondents. These findings were consistent with findings of the Dutch study of internet users that found perceived severity in HIV self-testing was not a significant predictor of HIV self-testing (9). However, these findings are in contrast with literature that shows that perceived severity is one important component of the threat appraisal in the PMT. The threat appraisals indirectly enhance the protection motivation by increasing perceived severity (14). The PMT postulates that people's intention to protect themselves from a threat is influenced by their estimation of the seriousness or severity of the consequences of the threat, in this case HIV infection. The magnitude of harmful

consequences about a depicted event leads to a corresponding cognition of appraised severity. The protection motivation as well as the decisions to engage in the recommended protective activity will be high.

The results showed that HIV self-testers had a higher level of self efficacy ( $p < 0.05$ ) when compared to non self-testers. Those who perceived HIV self-testing as easy were more likely to practice self-testing than those who perceived it as difficult. However, the ability to confidently interpret the test result without professional assistance was not a significant predictor of self-test use. Considering that the respondents were all health workers, their ability to confidently interpret the test result without professional assistance may be similar. These findings on perceived self efficacy were consistent with the previously referred Dutch internet study (9) that reported that self-testers demonstrate higher self efficacy when compared to non self-testers of HIV. The evaluation of the personal ability to perform effectively the desired response (self efficacy) is a component of the coping appraisal. Several studies examining health behaviour have supported the structure of the model in predicting intention and behaviour (5,14). The findings of this study on self efficacy are therefore consistent with the postulation of the PMT.

This study also found that perceived reliability of self-test results is a significant predictor of HIV self-testing. This implies that those who perceive HIV self-test results as reliable are more likely to practice self-testing compared to others who perceive self-test results as unreliable. The confidence in HIV self-test results was assessed with two items; 'if the test result is negative, I can be sure that this result is correct' and 'if the test result is abnormal (HIV positive), I can be sure that this result is correct'. Confidence in abnormal results (HIV positive) was significant as a predictor of HIV self-test use unlike the confidence in normal results which was not a significant predictor. There are some studies that have also found that HIV self-testers had a higher response efficacy when compared to HIV non self-testers (9). Perceived reliability is a component of the response efficacy. Response efficacy is the belief that carrying out the recommended protective action (HIV self-testing) will be effective in protecting self. The findings of this study on response efficacy are therefore consistent with the postulation of the PMT. This study found that anticipated regret if individuals did not perform a HIV self-test and they subsequently turned out to be HIV infected was a non significant predictor of HIV self-testing. Privacy as an important factor in HIV self-testing was also a non significant predictor. According to the literature, privacy is identified as an important factor in HIV self-testing and some health workers chose HIV self-testing because it is private and anonymous (3,9).

In this study, some factors were identified by self-testers as having enhanced their HIV self-test use. These factors are supported by the existing body of literature. In particular, self-testing has been reported as a quick method of HIV detection and this is seen as beneficial by many people (6). Literature shows that HIV/AIDS related stigma and discrimination presents a major challenge in HIV testing. This may lead some to choose self-testing (15). While there are many benefits associated with accessing HIV testing as a couple (16-18), self-testing presents a new challenge in cases where a partner intimidates another to seek the HIV test. In this study, intimidation by a partner was identified as a factor contributing to HIV self-testing by 14.0% of the respondents (n=229) who practiced self-testing. Partner coercion is one of the issues that opponents of self-testing raise (1). Some of the self-testers indicated that they lack knowledge on where to get tested for HIV and this influenced them to self-test. According to Kenya AIDS Indicator Survey (KAIS) of 2007, lack of knowledge on where to get tested for HIV was cited as a barrier for HIV testing by 6.6% of women and 4.9% of men. However, the KAIS focused on the general population and one would expect health workers to know where to get a HIV test (19).

Inability to handle HIV positive results and the idea of self-test being scary were identified by the majority of health workers as inhibiting factors. Counselling aims at helping clients to deal with HIV results. However, HIV self-testing lacks this important component. The fear of stigma and discriminatory practices are real in the workplace and may discourage workers from accessing HIV testing services or seeking HIV prevention and care services following HIV testing (3,6,15).

Access to HIV test kits appears to be a main factor in influencing self-testing as it was identified by the majority of self-testers as the main influencing factor. Among non testers, lack of test kits was also identified as an inhibiting factor. This may indicate that increasing accessibility to HIV test kits may increase the number of health workers who practice self-testing.

In conclusion, acknowledging the study limitations, it can be concluded that unregulated self-testing using blood based test kits is highly practiced by health workers. Age, self efficacy and response efficacy were found to be significant predictors of HIV self-testing among the health workers. Increasing access to HIV test kits may increase the number of people who would practice self-testing. It would be important to address the negative harms associated with the practice of self-testing, in particular, cases where a person intimidates their partner to practice HIV self-testing as identified in this study. HIV related stigma influenced self-testing in two ways; fear of

stigma influenced some to choose HIV self-test and inhibited others. Some health workers, however few, lack knowledge about HIV while others lack knowledge on where to get tested for HIV despite many HIV information disseminations forums, working in health facilities that provide these services and easily available HIV information resources. Counselling needs to be addressed in the content of HIV self-testing. Some health workers report fear of the unknown associated with self-testing, some of which could be addressed through counselling. There are certain benefits associated with self-testing as identified in this study, including self-testing saves time, which can be explored further to expand HIV self-testing.

## REFERENCES

1. Ritcher, M., Venter, W. and Gray, A. Home self-testing for HIV: AIDS exceptionalism gone wrong. *S Afr Med J.* **100**: 636 – 642.
2. Mavedzenge, S., Baggaley, R., Lo, Y. and Corbett, L. *HIV self-testing among health workers: a review of the literature and discussion of current practices, issues and options of increasing access to HIV testing in Sub-Saharan Africa.* World Health Organization. Geneva. From: [http://whqlibdoc.who.int/publications/2011/9789241501033\\_eng.pdf](http://whqlibdoc.who.int/publications/2011/9789241501033_eng.pdf) (accessed March 17 2011).
3. Kalibala, S., Tun, W., Muraah, W., Cherutich, P., Oweya, E. and Oluoch, P. "Knowing myself first": Feasibility of self-testing among health workers in Kenya. Population Council. Nairobi, Kenya.
4. Choko, A., Desmond, N., Webb, E., Chavula, K. and Napierala-Mavedzenge, S. The Uptake and Accuracy of Oral Kits for HIV Self-Testing in High HIV Prevalence Setting: A Cross-Sectional Feasibility Study in Blantyre, Malawi. *PLOS Med.* **8**: 1-11.
5. Lee, V., Tan, S., Earnest, A., Seong, P., Tan, H. and Leo, Y. User Acceptability and Feasibility of Self-Testing With HIV Rapid Tests. *J. Acquir. Immune Defic. Syndr.* **45**: 449-453.
6. Kachroo, S. Promoting self-testing for HIV in developing countries: Potential benefits and pitfalls. *Bulletin of the World Health Organization.* **84**: 999-1000.
7. Walensky, R. and Bassett, V. HIV Self-testing and the Missing Linkage. *PLOS Med.* **8**:1-2.
8. Walensky, R. and Paltiel, A. Rapid HIV Testing at Home: Does it solve a Problem or Create One? *Ann. Intern. Med.* **145**: 459-462.
9. Grispen, J., Ronda, G., Dinant, G., Vries, N. and Weijden, T. To test or not to test: A cross-sectional survey of the psychosocial determinants of self-testing for cholesterol, glucose, and HIV. *BMC Public Health.* **11**: 1471-2458.
10. Conner, M. and Norman, P. *Predicting Health Behaviour.* 2nd edition. Open University Press.
11. Rogers, R. A protection motivation theory of fear appeals and attitude change. *J Psychol.* **91**: 93-114.
12. Floyd, D., Prentice-Dunn, S., and Rogers, R. A Meta-Analysis of Research on Protection Motivation Theory. *J Appl Psychol.* **30**: 407-429.
13. Lee, T., Kilbreath, S., Sullivan, G., Refshauge, K. and

- Beith J. The development of an arm activity survey for breast cancer survivors using the Protection Motivation Theory. *BMC Cancer*. 7: 75.
14. Boer, H. and Seydel, E. *Protection motivation theory*. In M. Conner and P. Norman (Eds) *Predicting Health Behaviour*. Buckingham: Open University Press.
  15. Stewart, R., Pulerwitz, J. and Esu-Williams, E. *Addressing HIV/AIDS Stigma and Discrimination in a Workplace Program: Emerging Findings*. Population Council. From: <http://www.popcouncil.org/pdfs/horizons/eskombslnsum.pdf> (accessed July 10, 2012).
  16. Centres for Disease Control and Prevention. 2003. *Advancing HIV prevention: new strategies for a changing epidemic –United States*. Morbidity and Mortality Weekly Report, 2003, 52:329–332. From: <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5215a1.htm> (Accessed March 19, 2011).
  17. Uganda Ministry of Health. 2005. *HIV counselling and testing: A National Counsellor Training Manual*. Kampala.
  18. World Health Organization. 2012. *Guidance on couples HIV testing and counselling including antiretroviral therapy for treatment and prevention in serodiscordant couples: recommendations for a public health approach*. Geneva, Switzerland.
  19. Ministry of Health. 2008. *Kenya National AIDS Indicator Survey Preliminary Report 2007*. National AIDS and STI control Programme. Nairobi, Kenya.