



# The Effectiveness of Nurse-Led PMTCT Health Education on Self-Stigma Reduction Among HIV-Positive Women in Mombasa County, Kenya

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DOI: <https://dx.doi.org/10.4314/ajhs.v36i2.8>

## Abstract

### BACKGROUND

Stigma compromises the quality of life of people living with HIV/AIDS. There is a critical knowledge gap on how to combat self-stigma among HIV-positives. The study assessed the effectiveness of nurse-led PMTCT health education on self-stigma reduction among HIV-positive women attending PMTCT antenatal clinics in Mombasa County, Kenya.

### METHODOLOGY

The study used a two-group, quasi-experimental research design. All pregnant HIV-positive women of reproductive age (18-49) who attended PMTCT prenatal clinics at the selected Mombasa County healthcare facilities were included in the study. A nurse-led health education program on PMTCT was provided at the intervention location but not at the control site. The mean difference in the proportion of mothers who reported self-stigma between the intervention and control groups was computed using a chi-square statistic. To assess the effectiveness of nurse-led PMTCT health education intervention, the difference in difference (DiD) was conducted.

### RESULT

Chi-square statistics indicated that there were significantly ( $\chi^2=151.096$ ,  $df=1$ ,  $p<0.001$ ) more HIV-positive women with low self-stigma in the intervention group compared to the control group at the end-line survey. Nurse-led health education on PMTCT reduced the proportion of self-stigma in HIV-positive women from 62.1% to 10.6%. It thus reduced the proportion of self-stigma in HIV-positive women significantly by 82.6%.

### CONCLUSION

Nurse-led PMTCT health education should be integrated with other interventional strategies aimed at reducing self-stigma among HIV-positive women attending PMTCT antenatal clinics

*Keywords: PMTCT; Quasi Experiment; DiD; Nurse-Led PMTCT Health Education*

[*Afr. J. Health Sci.* 2023 36 (2): 162-170]

## Introduction

HIV/AIDS continues to be a significant global public health problem and the leading cause of disability-adjusted life year lost in

many countries, with an estimated record of 47.63 million DALYs in 2019 globally, presenting a 1.28-fold increase from 1990 to 2019 (1). According to WHO, an estimated 38.4



million people were living with HIV at the end of 2021, two-thirds of whom (25.6 million) are in the WHO African Region (2).

Notwithstanding improvements in the prevention of mother-to-child transmission (PMTCT) of HIV, an estimated 1.7 million children under age 15 were living with HIV in 2018, and almost two-thirds (63%) of children living with HIV are in sub-Saharan Africa (3). Different strategies have been implemented to interrupt the transmission of HIV/AIDS. One of the key strategies or programs designed to reduce the transmission of HIV/AIDS from mother to child HIV is the prevention of mother-to-child HIV transmission (PMTCT) program using four pillars. The results of implementing worldwide PMTCT indicate the effectiveness of the programs in reducing HIV transmission from mother to child, and the use of Option B+ as PMTCT intervention was found to be more effective in reducing Mother to Child Transmission of HIV compared to other options (4,5). However, the global population of children whom are HIV exposed to an uninfected individual is considerable, requiring a harmonized strategy to reduce HIV exposure in children and warrant optimal health and well-being of children who are HIV exposed to uninfected and their families (6).

Effective HIV treatment and preventive strategies such as PMTCT services face challenges due to HIV-related stigma (7,8). Stigma compromises the quality of life of People living with HIV/AIDS (9–11). HIV-related self-stigma occurs when a person with a stigmatized condition is aware of public stigma, internalizes the negative beliefs in society and accepts their validity (12–14). According to previous studies, self-stigma manifests in multiple ways, including shame or feeling dirty, guilt and fear (15,16). Stigma is linked to adverse psychological, social, and physical health outcomes across countries and key populations (8,10,17,18).

Treatment and prevention strategies such as counselling, cognitive-behavioural therapy (CBT), empowerment, self-help, and

support groups are designed and implemented to reduce self-stigma for most physical illnesses such as HIV/AIDS, leprosy, tuberculosis, and epilepsy (17). Despite these multiple interventions for the significant reduction of self-stigma among people living with HIV/AIDS, there is still limited evidence that evaluates the effectiveness of nursing-led health education intervention in reducing self-stigma among HIV-positive women who attend PMTCT programs (8,19). In particular, there is a critical knowledge gap regarding combating self-stigma among HIV-positive or otherwise impacted individuals. There is no synthesis of research on interventions that reduce self-stigma in situations with low resources.

Lack of tailored health education on self-stigma leads to the long-run ineffectiveness of PMTCT health program, which contributes to a high transmission rate of mother-to-child HIV/AIDS. The main aim of this study was to assess the effectiveness of nurse-led PMTCT health education on self-stigma Reduction among HIV-positive women attending PMTCT antenatal clinics in Mombasa County, Kenya.

## **Methodology**

### ***Study design and timeline***

The study used a two-group, quasi-experimental research design. The study had intervention and control groups. Between November 2020 and January 2021, baseline survey data was collected. The end-line survey was conducted in September and October 2021, six months after the intervention was implemented.

### ***Study setting***

The study was carried out in Kenya's Mombasa County. Four medical centres were randomly chosen and assigned to the intervention and control sites. HIV prevalence among adults in Mombasa County (aged 15 to 49) is estimated at 7.4%, with a higher prevalence among women (10.5%) (20). There are 1,609 adult new HIV infections per year in the county. Notably, Key Populations account for 44% of all new infections. Despite



advancements in ANC and PMTCT, 171 newborn newborns contract HIV each year. Given the global effort to end mother-to-child HIV transmission, this number is essential (20).

### ***Study population***

The study population included pregnant women living with HIV and who attended ante-natal PMTCT clinics of Tudor Sub County Hospital, Kisauni CDF health centre, Likoni Sub County Hospital and Port Reiz Sub County Hospital in Mombasa County. Mothers in Likoni and Tudor hospitals served as the intervention group because of the size, while the group in both Kisauni and Port Reiz hospitals served as the control group. The intervention sites received nurse-led health education on PMTCT, while the control sites received no education on PMTCT.

### ***Study participants***

This study included all HIV-positive pregnant women of reproductive age (18-49) who were attending PMTCT antenatal clinics in the selected health facilities in Mombasa County, the two arms of the study areas. The study also included husbands who accompanied their spouses to the antenatal clinic. Women who were severely ill during the survey period and those who did not consent to participate were excluded.

### ***Sample size and sampling procedure***

The study aimed at comparing the primary outcomes in the study site at baseline and end line. Therefore, the sample size formula for differences in two proportions of the target population was convenient. A sample size formula according to the Fleiss method was used (21) to select 214 participants each for the control and intervention arms. Actual data was collected on 100 and 113 respondents in control and intervention sites, respectively

### ***Intervention***

The intervention site received nurse-led health education on PMTCT, while the control site did not receive nurse-led health education.

### ***Key elements of the intervention***

The nurse-led health education training module covered the importance of adherence to medication, prescribed diet, prenatal and postnatal PMTCT clinics, HIV status self-disclosure to a sexual partner, and strategies for self-stigma reduction. The intervention aimed at triggering the HIV-positive women attending antenatal PMTCT clinics to adopt positive behaviour change towards PMTCT, increase disclosure of their HIV status to their sexual partner and reduce self-stigma among them.

### ***Data collection***

Before beginning intervention at the intervention location, baseline data were gathered at the control and intervention sites. Following that, the intervention was implemented for six months at the intervention site. End-term data were gathered in both the intervention and control locations after six months

### ***Data analysis***

Collected data were entered into Excel spreadsheets and cleaned then the data was exported to SPSS version 22.0 (IBM Corporation, New York, USA) for coding and analysis. Continuous data were tested for normality using Kolmogorov-Smirnov Test; if the data distribution conformed to normality, we analyzed and presented it as mean  $\pm$  standard deviation (SD). If data did not conform to normality, median and mode were reported. Frequencies and relative frequencies for all categorical variables were recorded and cross-tabulated. Nominal categorical data were analyzed using the chi-square or Fisher's exact test to analyze the difference between control and intervention groups. To test for the mean difference in the proportion of mothers who reported self-stigma between the intervention and control groups, a chi-square statistic was computed, and the mean difference was deemed statistically significant at a 95% confidence interval (95% CI) with the  $p$ -value  $p \leq 0.05$ . Chi-square statistics were used to determine social

demographic factors influencing adherence to PMTCT among HIV-positive women.

### **Ethical consideration**

The Institutional Ethical Review Committee of the University of Eastern Africa, Baraton approved this study (REC: UEAB/08/02/2019). In addition, a research permit was obtained from the National Commission for Science, Technology and Innovation (NACOSTI/P/19/52977/30423). Permission was sought from the Hospital administration of Tudor, Likoni, Kisauni and Port Reiz hospitals. Informed consent was received from participants before participation and data collection.

## **Results**

### **Self-stigma levels among participants**

At baseline, 37 (36.6.0%; 95% CI: 27.5-41.8) out of 100 HIV-positive women in control had low self-stigma, while 64 (63.4%; 95%CI:54.0-72.8) had high self-stigma. For the intervention group, out of 113 HIV-positive women, 42 (37.8.0%; 95%CI:28.3-46.1) had low self-stigma, and 69(62.2%; 95%CI:52.1-

70.1) had self-stigma. Chi-square statistics indicated no significant difference ( $\chi^2=0.033$ ,  $df=1$ ,  $p=0.856$ ) in self-stigma for HIV-positive women in the control group compared to the intervention group at the baseline survey. Out of 100 HIV-positive women in the control group at the end-line, 5 (4.95%; 95%CI:0.72-9.2) had self-stigma while 95 (94.1%; 95%CI:89.5-98.7) had high self-stigma. On the other hand, out of 100 HIV-positive women, 101(89.4%; 95%CI:83.7-95.1) had low self-stigma, while 12(10.6%; 95%CI:4.92-16.3) had high self-stigma at the intervention site. Chi-square statistics indicated that there were significantly ( $\chi^2=151.096$ ,  $df=1$ ,  $p<0.001$ ) more HIV-positive women with low self-stigma in the intervention group compared to the control group at the end-line survey (see Table 1).

There is no statistically significant difference in the proportion of HIV-positive women adhering to PMTCT between the control and intervention groups at the baseline survey ( $\chi^2=1.232$ ,  $df=1$ ,  $p=0.267$ ). (Figure 1).

**Table 1:**

Self-stigma levels among HIV mothers in the control and intervention sites at baseline and end-line of the survey

Group	Baseline survey					End-line survey				
	High Stigma n (%)	Low Stigma n (%)	$\chi^2$	df	p-value	High Stigma n (%)	Low Stigma n (%)	$\chi^2$	df	p-value
Control	64(63.4)	37(36.6)	0.033	1	0.856	95(95.0)	5(5.0)	151.096	1	<0.001
Intervention	69(62.2)	42(37.8)				12(10.6)	101(89.4)			

**Table 2:**

DiD result on the effect of nurse-led health education intervention on self-stigma between intervention and control groups at baseline and end-line surveys.

Variable percentage score	Baseline survey			End line survey			Contribution DiD
	C(%)	I (%)	Diff(I-C)	C (%)	I(%)	Diff(I-C)	
Self-stigma	40.8	39.7	-1.1	67.7	31.2	-36.5	-35.4***

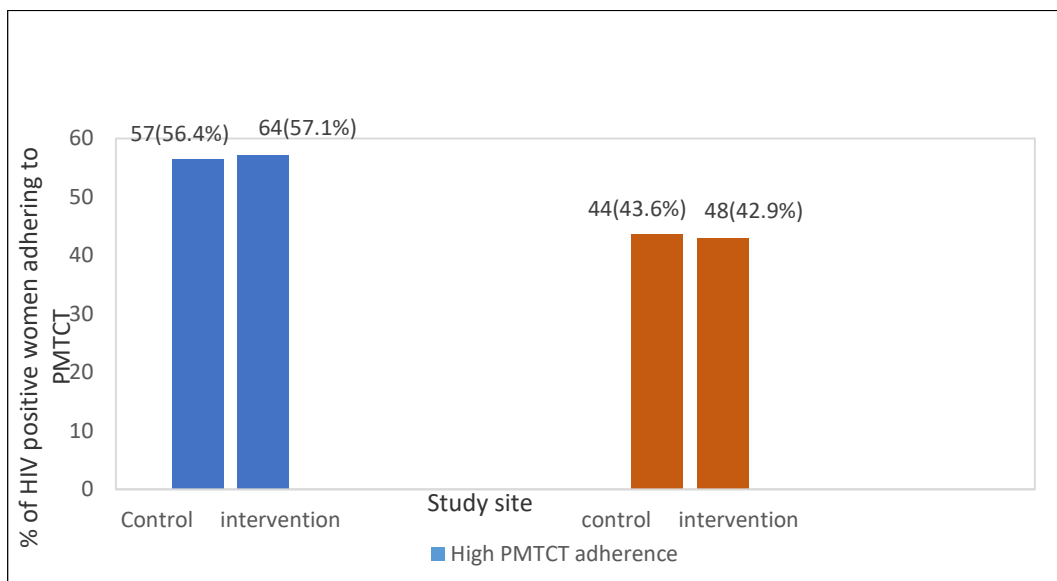
\*\*\* $p < 0.0001$ ; C, control group; I, intervention group; DiD, the difference in differences

However, after the intervention, Figure 2 shows that there were significantly ( $\chi^2=5.912$ ,  $df=1$ ,  $p=0.015$ ) more HIV-positive women adhering to PMTCT among the intervention group compared to the control group at the end-line survey.

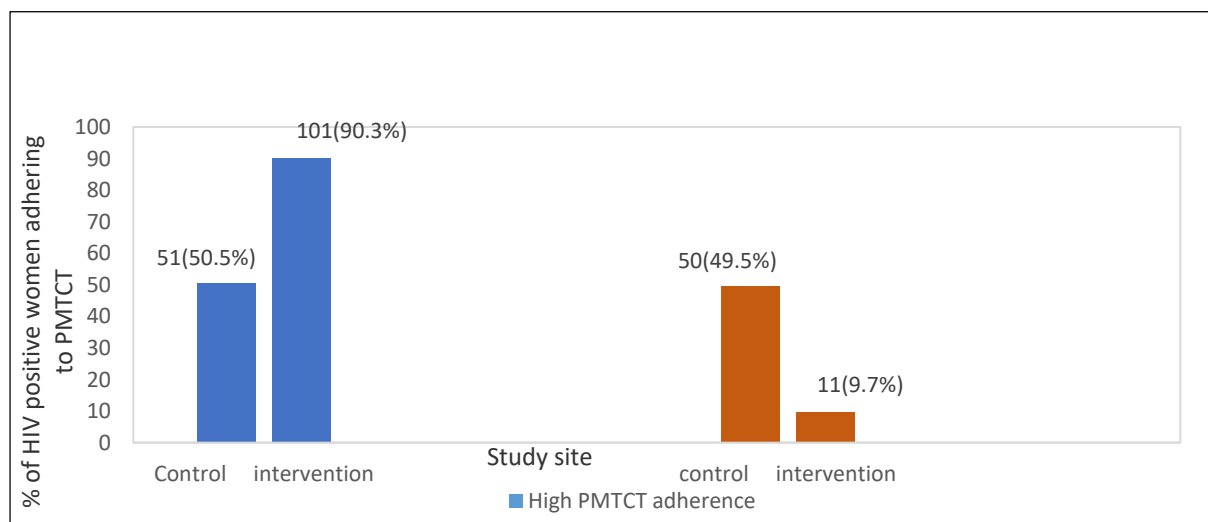
## Discussion

Stigma related to HIV infection remains a concern in Sub-Saharan Africa (SSA) and influences depression among HIV-positive

mothers (22). A study elsewhere indicated that health education during counselling reduces self-stigma among patients (23). Another study after a Quasi-experimental study indicated that Psychoeducation reduced self-stigma among patients with schizophrenia with an effect of ( $F(1,19)=5.52$ ;  $p<0.05$ )(24). A recent systematic review revealed that psycho-educational intervention is among the five interventions that reduce self-stigma among people living with HIV.



**Figure 1:** Level of adherence to PMTCT among HIV-positive women at the study sites in the baseline survey.



**Figure 2:** Level of adherence to PMTCT among HIV-positive women at the study sites in the baseline survey.



However, the findings further revealed that psycho-educational intervention is the main intervention that can reduce self-stigma successfully among HIV-positive individuals (7). Studies have shown that educational workshops on HIV, testing, and stigma successfully reduce self-stigma about HIV (25).

Due to its negative effects on anticipated and perceived stigma, affective, cognitive, and mental health outcomes, and healthcare behaviours that eventually impact physical health outcomes, self-stigma is particularly harmful (26,27). In summary, self-stigma raises the risk of not receiving life-saving antiretroviral medication (ART), reduces people's quality of life, and increases suicide ideation, increasing AIDS-related morbidity and mortality (28). Education profoundly impacts society, improving access to healthcare and raising people's general health awareness. Educational anti-stigma programs give accurate facts about the stigmatized disease to rectify misconceptions or refute unfavourable attitudes and beliefs. They dispel false myths or prejudices by substituting accurate information.

When used as a part of cognitive and behavioural therapy, educational interventions have been demonstrated to be beneficial in lowering self-stigma, enhancing stress management, and promoting self-esteem despite often being intended to counteract public stigma (29). Cognitive-behavioural therapy was the only individual-level intervention that (in a small number of studies) proved to be helpful (30).

In our present study, the proportion of women with self-stigma significantly decreased in the intervention site compared to the control site and end-line survey. After DiD analysis to determine the impact of nurse-led health education on PMTCT, the result indicated that the intervention successfully reduced self-stigma among HIV-positive women with a net reduction of 35.5%,  $p < 0.0001$ . A study

elsewhere indicated that empowerment and educational radio programs significantly reduced self-stigma among people living with HIV (9). The validated findings indicate that nurse-led health education is a good intervention to reduce self-stigma and improve PMTCT adherence among HIV-positive mothers. This intervention needs to be integrated with other validated interventions to reduce self-stigma among people living with HIV.

## Conclusion

Implementation of PMTCT nurse-led health education reduced the proportion of self-stigma in women living with HIV from 62.1% to 10.6% and thus reducing the proportion of self-stigma in women living with HIV significantly by 82.6%. Nurse-led PMTCT health education should be integrated with other interventions to reduce self-stigma among HIV-positive women attending PMTCT antenatal clinics.

## Limitations and strengths of the study

The current study has many strengths; the findings will help the government to improve clients' adherence to PMTCT by allocating resources prudently for nurse-led health education and implementation process; the findings are consistent with the findings from other studies, the study was conducted in high HIV prevalence areas hence giving representative results. On the other hand, the study has several limitations; the sample size used in this study is relatively small hence affecting the reliability and validity of the study; hence a more extensive sample size study is recommended. There were possible falsified responses from the participants. The study was conducted on the coastline; hence, a study which will include participants from other settings is required for comparison.



## Availability of data set and materials

The data set used during the analysis in this study is available from the corresponding author upon reasonable request that does not breach the ethical issues and ethical approval purpose of this study.

## Conflict of interest

The authors declare that there are no conflicts of interest.

## Source of funding

The study was self-funded.

## Acknowledgement

The authors thank Kisai, Likoni, Tudor and Port Reiz administrations for permitting us to collect data. We also appreciate the participants who agreed to participate in the study. Finally, we acknowledge the institutional ethical review committee of The University of Eastern Africa, Baraton for approving this work and NACOSTI for giving us data collection permission.

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