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# Challenges in Efficiently using HIV Services to Prevent Mother-to-child Transmission among Pregnant and Breastfeeding Women in Gauteng Province

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**Abstract:**

***Introduction:*** Despite tremendous success in improving the availability of the elimination of mother-to-child transmission (EMTCT) programs, major impediments to its usage and adherence to these services continue to exist among pregnant and breastfeeding women. Even though these services are available and promoted, pregnant women and breastfeeding women face various challenges in accessing and utilizing them.

***Aim:*** The study aimed to describe Challenges in efficiently using HIV services to prevent mother-to-child transmission among pregnant and breastfeeding women in Gauteng province.

***Methods:*** This study adopted a quantitative study design with a cross-sectional approach. A self-administered questionnaire was utilized to assess 681 pregnant and breastfeeding women. The data was analyzed using descriptive statistics. Using STATA 15.0, chi-square tests, odds ratios, and logistic regression were used to investigate the relationship between various demographic characteristics and knowledge of barriers to EMTCT service utilization.

***Results:*** More than 432 (64%) of respondents were aware of EMTCT services, and just 279 (41%) reported having a poor understanding of the service. This implies that even though awareness of EMTCT services is relatively high, the depth of understanding is inadequate. Barriers that contributed to poor EMTCT utilization were transport costs to the facility, staff attitude, and long waiting times. Notably, hurdles included high transportation costs, long wait times, and poor knowledge about EMTCT benefits and staff attitude.

***Conclusion:*** To fully realize the budding of EMTCT services as an effective HIV prevention strategy for pregnant women and breastfeeding women, continual efforts must be made to remove barriers and enhance patient knowledge.

**Keywords:** Barrier, Utilization, EMTCT, Pregnant women, Breastfeeding women, HIV prevention.

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## 1. INTRODUCTION

The EMTCT services serve an important role in minimizing vertical transmission of HIV during the prenatal, delivery, and postnatal period [1]. With proper utilization of EMTCT services, there will be a reduction of vertical transmission of HIV [1]. Notably, 90% of children under 15 years old were infected with HIV through vertical transmission. According to UNAIDS [2], in 2022, approximately 82% of pregnant and nursing women living with HIV worldwide received antiretroviral treatment, up from 46% in 2010. Yet, new HIV infection cases in children 0 to 14 years account for 160,000. Vertical transmission of HIV can be prevented by maternal ART during antenatal and postnatal periods [3]. Despite significant progress in recent years, on a global scale, there are still barriers that prevent pregnant and breastfeeding women from making full use of EMTCT services [4].

The World Health Organization (WHO) [5] reported that sixteen nations and states have been accredited for accreditation of EMTCT services, with Botswana being the first African country to be validated. China, India, Brazil, Russia, and Cameroon successfully implemented the PMTCT program. However, barriers like maternal adherence to ART post delivery and retention remain a stumbling block to the achievement of the program [6-9]. In Indonesia since the inception of the EMTCT program in 2009. In 2022, it was found that approximately 37% of pregnant Indonesian women had not received HIV screening, and only 18% of women living with HIV had accessed ART [10]. This has resulted in several HIV infections in children born during that year. A study conducted by Purnamawat *et al*. [11] revealed several obstacles to inadequate EMTCT services uptake, including distance-related access for pregnant women, limited primary healthcare centres offering HIV testing, and insufficient knowledge about EMTCT services among healthcare providers and patients.

Oshosen *et al*. [12] reported that women and young girls account for 60% of new HIV infections in Sub-Saharan Africa. In a study conducted by Tiam *et al*. [13], high HIV seroconversion rates during antenatal and postnatal periods resulted in significant vertical HIV transmission to exposed infants. Several barriers constitute the continual barrier of MTCT in SSA [1]. One of the primary obstacles related to low uptake of EMTCT services is the lack of access to comprehensive antenatal care [14].

In South Africa, poor retention and loss to follow-up postdelivery remain a challenge [15]. Gauteng province's high HIV prevalence rates necessitate the provision of EMTCT services to prevent new HIV infections in children. According to a study by Myer *et al*. [16], access to antenatal care is crucial for the identification and management of HIV-infected pregnant women, as it provides an opportunity for early HIV screening, ART initiation for those identified and monitoring of maternal and infant health. However, many pregnant women in Gauteng province face barriers such as long wait times, overcrowded facilities, and inadequate resources, which ultimately lead to missed opportunities for EMTCT services [15].

Stigma and discrimination also play a significant role in the low EMTCT service uptake among pregnant and breastfeeding women [17]. Matseke *et al*. [18] found that stigma and discrimination related to HIV can deter women from seeking EMTCT services, as they may fear negative reactions from healthcare providers, community members, and even their own families. This reluctance to access EMTCT services due to stigma and discrimination can result in missed opportunities for HIV testing, ART initiation, and adherence counselling, putting both the mother and child at risk for HIV transmission [19].

Lack of information and awareness among pregnant and breastfeeding women of EMTCT services in Gauteng province impedes the successful uptake [20]. Mutabazi *et al*. [14] highlighted that several women are unaware of the EMTCT services available to them, leading to low uptake of HIV testing, ART, and other essential interventions. This lack of awareness can be attributed to poor dissemination of information, limited health education, and cultural beliefs that may influence women's decision making regarding healthcare utilization [21].

In addition to these hurdles, structural and systemic issues contribute to the poor adoption of EMTCT services in South Africa [22]. These challenges include understaffed facilities, inadequate infrastructure, and limited resources for HIV testing and treatment. A study by Goga *et al*. [23] found that healthcare facilities in Gauteng province often face shortages of essential supplies and medi-cations, which may result in suboptimal EMTCT service delivery and limited access for pregnant and breastfeeding women. Despite significant progress in recent years, on a global scale, there are still barriers to accessing health care, inefficiency in service delivery, stigma, and socio-economic barriers. An understanding of the causes of underutilization or inefficient use of the available services will help in their improvement and effectiveness in service delivery. Therefore, addressing these barriers is crucial for improving EMTCT services adoption and ultimately reducing vertical HIV transmission in Gauteng province.

## 2. MATERIALS AND METHODS

This study employed a cross-sectional quantitative descriptive methodology to investigate the barriers to EMTCT service uptake among pregnant and breastfeeding women in Gauteng province [24].

### 2.1. Study Setting

The study was carried out in Ekurhuleni, Gauteng, South Africa, which is the province's second-largest district. It is the second largest city in the province's eastern region, accounting for over a quarter of the provincial Gross Domestic Product (GDP). The city contains three Sub-District Services, 93 permanent clinics, and six hospitals. The province is organized into nine urban municipalities and districts [24].

### 2.2. Study Population and Sampling

The research focused on pregnant and breastfeeding

women in Gauteng province, South Africa, who sought EMTCT services. The target population was women aged 18 and above. A convenience sampling method was used to select these women based on accessibility and availability, ensuring the study's comprehensive coverage.

### 2.3. Data Collection Instrument

A structured questionnaire was used to collect data. The question was developed aligned with the study objectives. The developed instrument was adopted from the findings of a study [25]. The data collection tool was developed in English and translated into two local languages, namely Isizulu and Northern Sotho. The instrument consisted of six sections: demographic and socioeconomic information, knowledge about EMTCT services, practices, attitudes and beliefs, barriers to service utilization, and potential strategies to facilitate service utilization [24].

### 2.4. Data Collection

Data was collected from pregnant and breastfeeding women aged 18 and above using a self-administered questionnaire utilizing EMTCT services in the healthcare facilities. Pregnant women and lactating mothers were recruited when they came for their follow-up services. The process of data collection took over six months. The completion of the questionnaire took about an estimated 45 minutes. The questionnaires were filled by the respondents in the presence of the researcher, who provided support and clarity where necessary. The study collected demographic data from six clinics between April 18th and October 3rd, 2023, including age, religion, marital status, education level, religion, employment status, and living arrangements [24]. The data collection tool was pretested to ensure content validity and accuracy.

### 2.5. Validity and Reliability

To ensure validity, the instrument was developed guided by the study's objectives. Before data collection, it was reviewed by an expert in the Department of Public Health of the University of Venda, the assistant director of Maternal and child health, the maternal and child health district coordinator, medical doctors and midwives offering EMTCT services, and stakeholders. To ensure that the respondents would understand the questions, the questionnaire was translated into Isizulu, Northern Sotho, by the language experts. The pre-test was done on 40 pregnant women and lactating mothers who did not form part of the study to test the clarity and appropriateness of the questions and the feasibility of the study. This was done by administering the questionnaire to the same respondents within 2 weeks, the responses from first and second sets were compared by calculating the correlation coefficient. The correlation coefficient was 0,80, showing that the instrument was reliable.

### 2.6. Data Analysis

The data was cleaned, coded, and entered into an Excel spreadsheet before being imported into Stata software for statistical analysis. Demographic variables and attitude scores were summarized using descriptive metrics such as means or median. For continuous numerical variables, the data was evaluated for normal distribution and outliers. Descriptive statistics were used, with the Chi-Square test used to link observed data in proportions, percentages, frequencies, and averages. A p-value $< 0.05$ signifies a significant link between two reliable variables and the outcome [24].

### 2.7. Data Quality

The data collection tool was created after reviewing the literature on barriers to EMTCT service utilization and adopting principles for creating accurate questions for excellent data collection. Before beginning data gathering, the data collection tool was pre-tested to confirm that it accurately measures the desired findings.

### 2.8. Ethical Consideration

Ethical approval from the Gauteng Department and relevant facilities managers, and participants were informed about its purpose and rights to confidentiality. The University of Venda's Research Ethics Committee and the Ekurhuleni Health District Research Committee both provided ethical clearance. All respondents who had not been subjected to harm or maltreatment provided written consent. Participation was entirely voluntary, and participants were free to withdraw at any moment without compensation. To keep participants anonymous, codes were used instead of their names. Facility administrators verbally agreed to the data gathering.

## 3. RESULTS

### 3.1. Socio-demographic Information

The sample included 681 pregnant and breastfeeding women utilizing EMTCT services, 253 (37.2%) respon- dents were aged between 25-31 years, while 204 (30%) were for age between 18-24 years. Five hundred and thirty-two (79%) respondents were single, while 6 (1%) were widowed. Two hundred and fifty-four (37%) were living with their parents, while 203 (30%) lived with their spouse. Three hundred and sixty-two (53%) of the study respondents have Grade 12 education, while 143 (21%) had no formal education. Four hundred and fifteen (61%) respondents were unemployed, while 83 (12%) were self-employed. About 558 (82%) of the respondents were Christians and 123 (18%) practiced other forms of religion. Demographic characteristics are presented in Table **1** [24].

### 3.2. Knowledge Level about EMTCT Services among Pregnant Breastfeeding Women

The study findings show that 432 (63%) pregnant and breastfeeding women were aware of EMTCT services, however, 279 (41%) had poor knowledge about EMTCT services. This demonstrates that even if women are aware of the EMTCT services rendered within the facilities, they still have a knowledge gap regarding EMTCT. About 503 (74%) respondents reported that their source of information about EMTCT services is healthcare workers, while 62 (9%) respondents rely on their relatives as the source. Six hundred and fourteen (90%) respondents knew that early participation in EMTCT ensures the well-being of the mother and the baby, while 10% did not know.

**Table 1. Summaries of the demographic information of respondents.**

| Variables | Frequency | Percentage (%) |
|---|---|---|
| **Age** | - | - |
| 18-24 | 204 | 30 |
| 25-31 | 253 | 37.2 |
| 32-38 | 167 | 24.5 |
| 39-45 | 41 | 6 |
| Above 45 years | 16 | 2.3 |
| **Marital Status** | - | - |
| Married | 122 | 18.1 |
| Single | 532 | 79 |
| Divorced | 13 | 1.9 |
| Widowed | 6 | 0.9 |
| **Who do you live with?** | - | - |
| Spouse | 203 | 29.8 |
| Parents | 254 | 37.3 |
| Friends | 44 | 6.5 |
| Other | 180 | 26.4 |
| **Level of Education** | - | - |
| No formal education | 143 | 21 |
| Senior Certificate (Grade 12 Matric) | 362 | 53 |
| Higher Certificate/ Diploma/ Bachelor | 118 | 17.3 |
| Postgraduate Diploma/ Degree | 28 | 4.1 |
| Other | 30 | 4.4 |
| **Employment Status** | - | - |
| Self-employed | 83 | 12.2 |
| Employed | 171 | 25.1 |
| Unemployed | 415 | 60.9 |
| Other | 12 | 1.8 |
| **Religion** | - | - |
| Christianity | 558 | 81.9 |
| Islam | 105 | 15.4 |
| African spirituality | 5 | 0.7 |
| Other | 13 | 1.9 |

**Table 2. Relationship between demographic characteristics and awareness of EMTCT services.**

| Demographic Information Item | | | Yes | No | Total | Pearson Chi-square | DF | Asymptotic significance (2-Sided) |
|---|---|---|---|---|---|---|---|---|
| Demographic information*Awareness of EMTCT services | | | | | | | | |
| Age | 18-24 | - | 113 | 90 | 203 | 10.095[a] | 4 | **0.039*** |
| | 25-31 | - | 167 | 85 | 252 | | | |
| | 32-38 | - | 107 | 59 | 166 | | | |
| | 39-45 | - | 30 | 11 | 41 | | | |
| | Above 45 | - | 13 | 13 | 26 | | | |
| **Total** | | - | **430** | **258** | **688** | | | |
| Level of education | No formal education | - | 70 | 73 | 143 | - | - | - |
| | Senior certificate 12/Matric) | (Grade) | 237 | 12 | 249 | 19.380[a] | 4 | **0.001*** |
| | Higher | - | - | - | - | | | |
| | Certificate/Diploma/bachelor's degree | | 78 | 39 | 117 | - | - | - |
| | Postgraduate diploma/degree | | 22 | 6 | 28 | | | |
| | Other | | 23 | 7 | 30 | | | |
| **Total** | - | | **430** | **64** | **494** | - | - | - |

*(Table 2) contd.....*

| Demographic Information Item | | Yes | No | Total | Pearson Chi-square | DF | Asymptotic significance (2-Sided) |
|---|---|---|---|---|---|---|---|
| Population group | Asian | 0 | 2 | 2 | 9.993[a] | 4 | **0.041*** |
| | Black | 419 | 236 | 655 | | | |
| | Colored | 3 | 6 | 9 | | | |
| | Indian | 0 | 0 | 0 | | | |
| | White | 4 | 0 | 4 | | | |
| | Not willing to say | 4 | 4 | 8 | | | |
| **Total** | - | **430** | **248** | **678** | | | |
| Nationality | South African-birth | 316 | 170 | 486 | 1.891[a] | 1 | **0.169** |
| | Non-South African | 114 | 78 | 192 | | | |
| **Total** | - | **430** | **248** | **678** | | | |
| Marital Status | Married | 75 | 47 | 122 | 2.777[a] | 3 | **0.427** |
| | Single | 343 | 18 | 361 | | | |
| | Divorced | 6 | 7 | 13 | | | |
| | Widow | 3 | 3 | 6 | | | |
| **Total** | - | **427** | **75** | **502** | | | |
| Who do you live with | Spouse | 130 | 72 | 202 | 1.941[a] | 3 | **0.585** |
| | Parents | 152 | 10 | 162 | | | |
| | Friends | 28 | 16 | 44 | | | |
| | Other | 120 | 60 | 180 | | | |
| **Total** | - | **430** | **158** | **588** | | | |
| Religion | Christianity | 360 | 195 | 555 | 7.028[a] | 3 | **0.071*** |
| | Islamic | 63 | 42 | 105 | | | |
| | African spirituality | 3 | 2 | 5 | | | |
| | Other | 4 | 9 | 13 | | | |
| **Total** | - | **430** | **248** | **678** | | | |
| Employment status | Self-employed | 55 | 28 | 83 | 6.213[a] | 3 | **0.102** |
| | Employed | 120 | 50 | 170 | | | |
| | Unemployed | 248 | 165 | 413 | | | |
| | Other | 7 | 5 | 12 | | | |
| **Total** | - | **430** | **248** | **678** | | | |

### 3.3. Association between Demographic Information and Awareness of EMTCT Services

Further analysis found that only age, education level, and population group were significantly linked with awareness of EMTCT services (chi-square p-value < 0,001). Half of the population that was not informed of EMTCT had no formal education, that is, they did not have grade 12. Other demographic factors had no significant association with awareness of EMTCT services, as evidenced by a chi-square value larger than 0.05. Marital status had no significant association with EMTCT awareness; nevertheless, single women reported a higher likelihood of being aware of EMTCT services, as shown in Table **2** [24].

### 3.4. Environmental Determinants Influencing EMTCT Use

The findings show that the financial barrier is one of the main barriers that has resulted in poor utilization of EMTCT. About 445 (71%) of the respondents have indicated that transport cost has affected their EMTCT utilization, whereas 28% of the respondents indicated that their poor EMTCT uptake is associated with unemployment. The findings further show that staff attitude is one of the barriers that affected the utilization of the program; 277 (34%) of the respondents reported that one of the barriers that affected their uptake of the EMTCT services was staff attitude, whereas 451 (66%) did not. Furthermore, the study findings show that long waiting times were reported to be the barrier to EMTCT utilization, 425 (62%) of the respondents reported long waiting times as the barrier, whereas 256 (38%) did not. The other barrier that has affected EMTCT utilization was the shortage of nurses/counselors, about 291 (43%) reported a shortage of staff as one of the barriers, whereas 388 (57%) did not report a shortage of nurses/counselors. The study findings further show that 181 (27%) of the respondents did not utilize EMTCT services because of the care they received in the past, whereas 497 (73%) were happy with the care they received. The study findings show that 174 (26%) of the respondents reported that they did not have partner support whereas 505 (74%) had partner support, hence, poor utilization of EMTCT services. About 140 (21%) of the respondents reported that they had missed EMTCT services, whereas 540 (79%) did not miss their appointment and 138 (20%) reported they had forgotten to come for their follow-up whereas 542 (80%) did not forget. The findings further showed that 96 (14%) of the respondents reported that distance from the facility affected their EMTCT utilization whereas 582 (86%) distance was not a barrier. Table **3** presents these findings [24].

**Table 3. Environmental determinants influencing EMTCT use.**

| Variables | Response and frequencies | Percentage (%) |
|---|---|---|
| Other medical or physical conditions | Yes n-200 | 29 |
| | No n=480 | 71 |
| Financial barriers | Transport cost n=445 | 72 |
| | Unemployment n=177 | 28 |
| Unfriendly hospital staff/attitude | Yes n=227 | 34 |
| | No n=451 | 66 |
| long waiting time at the clinic/hospital | Yes n=425 | 62 |
| | No n=256 | 38 |
| Nurse/counselor shortage | Yes n=291 | 43 |
| | No n=388 | 57 |
| I was unhappy with the care I received in the past | Yes n=181 | 27 |
| | No n=497 | 73 |
| lack of partner support | Yes n=174 | 26 |
| | No n=505 | 74 |
| Shortage of staff | Yes n=85 | 13 |
| | No n=595 | 87 |
| Do you ever forget to come for an EMTCT follow-up | Yes n=138 | 20 |
| | No n=542 | 80 |
| Have you ever missed an EMTCT appointment | Yes n=140 | 21 |
| | No n=540 | 79 |
| long distance to the health facility | Yes n=96 | 14 |
| | No n=582 | 86 |

## 4. DISCUSSION

It was noted that women are aware of EMTCT services, however, there is a knowledge gap on the EMTCT service and its benefits, which has led to poor utilization of this service amongst pregnant women and lactating mothers. The concurred finding revealed that most women are unaware of the availability and benefits of EMTCT services leading to low uptake [26]. Kalimba *et al*. [27] found that health education improves the use of EMTCT services, which contradicts the previous finding. A similar finding was reported by Kipp *et al*. [28], who observed that women who received targeted health education successfully utilized EMTCT services. Misinformation from friends, family, and social media can cause confusion and distrust among pregnant women regarding EMTCT services [29].

This study revealed that 73% of the respondents received information about EMTCT and its benefits from healthcare workers, while 16.9% received information from social media. Oluborode *et al*. [30] found that women who received information about EMTCT services through social media were more likely to seek HIV testing and treatment during pregnancy compared to those who did not have access to this information. The study also found a link (p-value =.001) between awareness of EMTCT services and the education level of women who participated. Typically, the higher one's educational level, the higher one's literacy and knowledge. Empirical evidence suggests that staff attitudes significantly affect the provision and utilization of EMTCT services. A study by Ngyende *et al*. [20] found that negative staff attitudes towards HIV/AIDS patients, such as stigma and discrimination, were major obstacles to EMTCT services utilization. Antenatal women living with HIV may avoid seeking care if they perceive judgment or mistreatment from healthcare providers. On the other hand, positive staff attitudes, such as empathy, respect, and non-judgmental communication, can increase the likelihood of pregnant women accessing EMTCT services [31]. The study reported that financial constraints are the factors that prevent pregnant and breastfeeding women from using EMTCT services. A study in sub-Saharan Africa found that transportation costs were a significant barrier to accessing EMTCT services [32, 33]. The study found that many rural women had to travel long distances to find healthcare institutions that provided EMTCT services [34]. Furthermore, studies have shown that women living in poverty are particularly vulnerable to the impact of transportation costs on EMTCT utilization [35].

The study findings show that long waiting times had a detrimental influence on women's use of EMTCT services. Many women may be discouraged from seeking care at healthcare facilities if they know they will have to wait for hours of waiting before receiving services. This finding concurred with the study by Carter and Elizabeth [36], which revealed that long waiting times have a detrimental impact on EMTCT services uptake, which leads to women feeling discouraged and disengaged from care. A study conducted in Kenya found that women who experienced long waiting times were more likely to discontinue care, leading to suboptimal treatment outcomes for both mother and child [37]. Furthermore, long waiting time was associated with patient dissatisfaction and limited counseling and can impact the quality of treatment provided to these women, resulting in a higher rate of transmission of HIV to infants. On the contrary, some findings revealed that pregnant women who experienced longer wait times at antenatal clinics were more likely to complete all aspects of the EMTCT cascade, including testing, treatment, and follow-up care [38, 39].

## 5. LIMITATION

The study focused only on the Gauteng province and cannot generalize the findings to the other provinces. Furthermore, the study focused only on EMTCT patients, other patients who were HIV and not pregnant were not considered in the study. Further research work should be done on qualitative methods to explore more detailed information about the challenges experienced in EMTCT utilization.

## CONCLUSION

In conclusion, significant progress has been made in expanding the availability of EMTCT services, but there remain substantial barriers that hinder the uptake of these services among antenatal and postnatal women. Addressing these barriers is critical to minimizing vertical transmission of HIV by ensuring that treatment is accessible to all women of reproductive age. Efforts to improve access to healthcare facilities, reduce stigma and discrimination and address systemic and individual-level challenges are essential in removing barriers to EMTCT services and improving the health and well-being of pregnant women and their children.

## RECOMMENDATIONS

The following recommendations have been made:

- Community education and awareness: Set up a community-based campaign to educate women about the value of EMTCT services.
- Strengthen healthcare systems by investing in training for healthcare workers and improving infrastructure and human resources.
- Integration of services: Combine EMTCT with other maternal and child health treatments.
- Improve retention in care by providing ongoing support and follow-up to pregnant and nursing women throughout their pregnancy and breastfeeding period.

## AUTHORS' CONTRIBUTIONS

N.M.: Prepared the original manuscript draft; N.M., T.T. and S.T.: reviewed and edited the manuscript.

## LIST OF ABBREVIATIONS

| | | |
|---|---|---|
| ART | = | Antiretroviral Treatment |
| EMTCT | = | Elimination of Mother-to-Child Transmission |
| GDP | = | Gross Domestic Product |
| HIV | = | Human Immunodeficiency Virus |
| MOU | = | Midwifery and Obstetric Unit |
| MTCT | = | Mother-to-child Transmission |
| SSA | = | Sub-Saharan Africa |
| UNAIDS | = | United Nations Programme on HIV/AIDS |
| WHO | = | World Health Organization |

## ETHICS APPROVAL AND CONSENT TO PARTICIPATE

The study is part of PhD program at the University of Venda, it included human participants and was approved by the University of Venda Research Ethics Committee: FSH/ 22/ PH /17/902), and the Ekurhuleni Health District research: GP_202302_056, South Africa.

## HUMAN AND ANIMAL RIGHTS

All procedures performed in studies involving human participants were in accordance with the ethical standards of institutional and/or research committee and with the 1975 Declaration of Helsinki, as revised in 2013. (http://ethics.iit.edu/ecodes/node/3931)

## CONSENT FOR PUBLICATION

Informed consent was obtained from all the study participants and institutional managers.

## STANDARDS OF REPORTING

STROBE guidelines were followed.

## AVAILABILITY OF DATA AND MATERIALS

The data supporting this study's findings are available from the corresponding author upon reasonable request. However, an MOU must be signed between the two parties, including journal and authors to ensure that ethical procedures are followed in all aspects of the study.

## FUNDING

None.

## CONFLICT OF INTEREST

The authors declare no conflict of interest, financial or otherwise.

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