



## Original Article

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# Health Belief Model Intervention: Bridging the Gap in Cervical Cancer Screening among Women Living with HIV in Mara, Tanzania

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## Abstract

**Background:** Cervical cancer is a significant health concern in Tanzania, especially among women living with HIV (WLHIV). Early detection through cervical cancer screening (CCS) is crucial for effective management. This study evaluated the effectiveness of integrating the Health Belief Model (HBM) into outreach services to increase CCS uptake among WLHIV in underserved health facilities in the Mara Region, Tanzania.

**Methodology:** We integrated the HBM into our outreach strategy to enhance CCS among WLHIV. Tailored interventions targeted high-volume health facilities in the Mara region, focusing on all six HBM constructs to foster belief, motivation, and action towards CCS. Healthcare providers underwent comprehensive training and conducted outreach services, addressing barriers, educating clients, and providing information on early screening benefits and treatment availability. Following implementation, we evaluated the effectiveness of this approach to identify shifts in CCS demand and utilization among WLHIV.

**Results:** Before the intervention, 3010 WLHIV were screened in Q4 and Q1 of 2023 according to PEPFAR operational calendar, with 0.86% VIA positivity and 76.9% receiving cryotherapy. Following the HBM integration and outreach in Q2, 3943 WLHIV were screened, 2.16% VIA positive, all receiving cryotherapy, achieving a 100% treatment rate. The effectiveness of the HBM-integrated outreach approach in Mara, Tanzania, is evidenced by the substantial improvement in CCS demand and utilization among WLHIV, showcasing heightened awareness and timely treatment of precancerous lesions.

**Conclusion:** Implementing the Health Belief Model increased CCS utilization among WLHIV in Mara, Tanzania, enhancing screening rates and enabling timely treatment of precancerous lesions. To maintain momentum, it's crucial to continue collaborative efforts, conduct educational campaigns, and utilize digital outreach strategies.

## Keywords

Cervical cancer screening, Health belief model, Women living with HIV, Outreach services, Mara-Tanzania

## Introduction

Cervical cancer stands as the fourth most common cancer in terms of both new cases and deaths among women worldwide, with around 604,000 new cases and 342,000 fatalities recorded in 2020 [1,2]. Significantly, the overwhelming majority (90%) of these cases arise in low and middle-income countries, with Sub-Saharan Africa carrying the heaviest burden regionally in terms of both incidence and mortality [1,2]. In 2020, East Africa experienced a significant burden of cervical cancer, with approximately 54,560 new cases reported, representing 26.7% of all cervical cancer incidences among women in the region [2]. Tanzania notably contributed 16.1% of these cases. Within Tanzania, the incidence and mortality rates stood at 34.3% and 21.8%, respectively [2]. These statistics highlight the critical need

for robust prevention and intervention strategies to tackle high cervical cancer rates in East Africa, especially Tanzania. Priority should be given to enhancing screening access, early detection, and implementing effective treatment programs to

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alleviate the burden of this preventable disease and enhance outcomes for those affected.

Although persistent infection with high-risk Human Papillomavirus (HPV), particularly subtypes 16 and 18, known as sexually transmitted viruses, is highly associated with almost (90%) of cervical cancer cases, it's crucial to understand that the virus alone is not adequate to cause the disease [3,4]. Additional significant co-factors comprise sexually transmitted infections (like HIV and chlamydia trachomatis), smoking, early onset of sexual activity, multiple childbirths, and extended use of oral contraceptives [2,4].

Women living with HIV (WLHIV) experience a heightened risk of cervical cancer due to their compromised immune systems. This vulnerability is particularly pronounced in Sub-Saharan Africa, where the prevalence of cervical cancer among WLHIV is notably elevated [5-7]. In Tanzania, specific regions such as Mwanza and Morogoro demonstrate prevalence rates ranging from 7.3% to 11% respectively [6,8]. These findings emphasize the critical necessity for focused interventions and holistic healthcare approaches to mitigate the rising burden of cervical cancer among WLHIV in Sub-Saharan Africa, including Tanzania. It is crucial to intensify screening, prevention, and treatment efforts to meet the unique needs of this vulnerable population.

The cornerstone of managing this disease lies in early detection through comprehensive screening of women in specific populations and promptly treating precancerous lesions to prevent their progression to malignancy [9]. The advancements in cervical cancer research and treatment, notably the utilization of Visual Inspection with Acetic Acid (VIA) and cryotherapy or thermocoagulation treatment, especially in low-resource settings, demonstrate significant progress in early detection and cost-effective treatment approaches [10,11]. The incorporation of cervical cancer screening into HIV care and treatment services in Tanzania marks a significant milestone in enhancing screening uptake. Women are advised to undergo CCS soon after receiving an HIV diagnosis, regardless of age, and are encouraged to have annual screenings thereafter [12].

Several factors contribute to the decrease in women seeking CCS, including lack of awareness, fear of pain during the procedure, limited access to healthcare facilities, cost, stigma, transportation, anxiety about abnormal results, and misconceptions about the screening process. Utilizing effective health education models is crucial, with the Health Belief Model (HBM) [13] being a well-established choice [14]. The HBM encourages participation and awareness, fostering preventive actions by emphasizing perceived susceptibility to cervical cancer, the severity of the disease, positive cues to action, perceived benefits of screening, perceived barriers, and ultimately, adoption of preventive behaviours. This study aimed to examine whether there were any observable shifts in CCS behaviour after the implementation of the HBM and the initiation of tailored outreach services targeting WLHIV in underserved Health Facilities across the selected health facilities in the selected districts in the Mara region.

## Materials and Methods

### Study design

The study adopted an implementation approach to promoting CCS among WLHIV within selected health facilities and other settings. This involved the implementation of educational materials, healthcare provider orientation, and outreach efforts.

### Study setting and participants

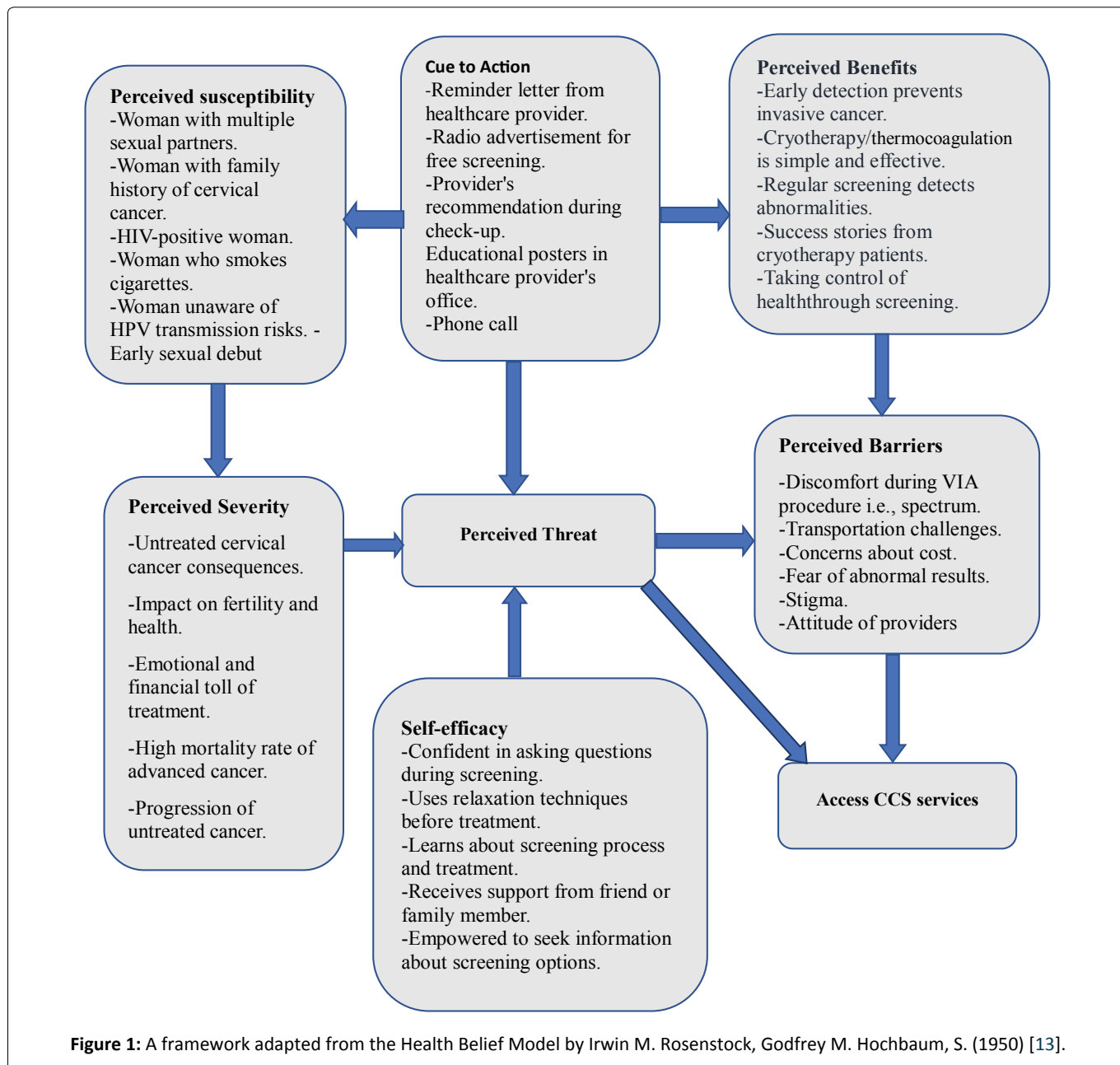
The Mara Region borders Kenya and Uganda to the north; the Simiyu Region to the south; the Arusha Region to the east and the Mwanza Region to the west. As of 2022, the estimated population stands at 2,592,288, with 1,267,157 males and 1,335,131 females [15]. According to the Tanzania HIV Impact Survey 2022-2023 (THIS 2022-2023), HIV prevalence among adults aged 15 years and older in the Mara region was recorded at 5% [16].

This study focused on health facilities catering to a high volume of WLHIV aged 15 and above in five selected District Councils, including Musoma Municipal, Bunda Town Council; and Butiama Bunda and Serengeti District Councils. The targeted health facilities included Musoma Municipal Council Hospital, Nyasho, Ikizu, Kisorya, Mugeta, Natta Health Centers, Bunda Designated Hospital, Manyamanyama Hospital, Butiama District Hospital, Nyerere Hospital, and RCH A Morotonga Dispensary. Additionally, outreach services were expanded to underserved areas with a significant population of WLHIV around those primary facilities.

### Description of Intervention

In our initiative to enhance demand and engagement in CCS services among WLHIV, we embarked on an innovative journey by integrating the HBM into our outreach strategy. This involved a thorough consideration of all six constructs of the HBM, strategically employed to boost the adoption of CCS services. Our dynamic approach included tailoring interventions to deeply resonate with our target audience and harnessing the model's principles to foster belief, motivation, and action towards CCS. We specifically targeted health facilities with a high volume of WLHIV aged 15 and above. Additionally, healthcare providers conducted outreach services to reach hard-to-reach areas and other hotspots. Healthcare providers in these facilities received thorough on-job orientation on the components of the HBM, integrating CCS by VIA and treatment with cryotherapy or thermocoagulation.

The onsite orientation and informational materials were carefully designed to align with the adapted HBM framework illustrated in Figure 1. Following the training, these providers actively disseminated information, education, and communication materials to eligible clients. They also served as points of contact for clients, addressing any questions or clarifications needed regarding CCS. Outreach efforts were conducted to raise awareness and promote participation in CCS. These efforts involved collaborating with local leaders and community health workers to establish hotspot sites in



underserved areas. Additionally, sessions were synchronized with existing health education sessions to ensure regular reinforcement throughout the day.

These materials addressed perceived barriers, educated clients about cervical cancer susceptibility, emphasized the seriousness of the issue, highlighted the benefits of early screening, and informed them about the availability of effective treatment in the early stages. Additionally, clients received reminder phone calls to encourage them to schedule screening appointments. After implementation at the end of Q2 2024, we evaluated the effectiveness of this approach to identify any disparities in the demand for and utilization of CCS services.

Data from this study are available and securely stored in the Design and Analysis Toolkit for Inventory and Monitoring (DATIM) platform. This repository serves as a vital resource for ensuring transparency, accountability, and the dissemination of findings to relevant stakeholders.

## Information Education and Communication Materials

To enhance community awareness, understanding, demand, and participation in CCS, we developed educational materials in Kiswahili, the national language, tailored to a seventh-grade reading level. The leaflets and posters were designed to simplify intricate medical concepts associated with CCS and foster discussions among WLHIV.

Healthcare providers, community health workers and local leaders played crucial roles in promoting the CCS program at clinics and other relevant sites to increase attendance. Clinic sessions were scheduled during the care and treatment clinic (CTC) health education sessions, ensuring that reinforcement was consistently provided throughout the day.

The educational materials were thoroughly designed to integrate culturally sensitive messages and align with the

six constructs of the HBM, as illustrated in [Figure 1](#). This approach aimed to enhance perceptions of susceptibility, severity, benefits, and barriers associated with CCS. Posters strategically placed alongside CTC providers at each clinic location provided clients with detailed information about the importance of CCS, the screening process, and the benefits of early detection and treatment.

## Ethical Consideration

This study rigorously adhered to ethical guidelines, resembling those of good clinical practice in research. Healthcare providers received training on privacy and confidentiality procedures, guaranteeing the secure storage of documents in locked cabinets and safeguarding data through password encryption software. Throughout the study, utmost priority was given to protecting the confidentiality and privacy of participants' personal information. Before screening procedures, informed consent was obtained from all individuals. Furthermore, proactive steps were taken to reduce any possible risks or discomfort to participants, with support services readily available.

## Results and Discussion

### Results

Before implementing the HBM and strengthening outreach services among selected health facilities to enhance demand and uptake of CCS services, 3010 WLHIV underwent screening for cervical cancer. This occurred during the fourth quarter (Q4) of financial year (FY) 2023 and the first quarter (Q1) of FY 2024, according to PEPFAR's operational calendar. Among them, 0.86% were detected as VIA positive, with 76.9% of these cases receiving treatment via cryotherapy/thermocoagulation. Following the intervention integrating the HBM and outreach services into underserved areas during the second quarter (Q2) FY 2024 there was a notable enhancement in both screening and treatment rates. In Q2 alone, 3943 WLHIV were screened, with 2.16% identified as VIA positive, all of whom received cryotherapy treatment, achieving a 100% treatment rate. These findings represent a significant enhancement in the demand for and utilization of CCS services among WLHIV in the Mara region. The intervention not only increased the number of individuals screened but also raised awareness and participation in screening initiatives, resulting in the timely treatment of all identified precancerous lesions through cryotherapy or thermocoagulation. These findings signify a notable improvement in the demand for and uptake of CCS services among WLHIV in the Mara region.

### Discussion

This study demonstrates that the effective incorporation of the HBM into outreach efforts highlights the effectiveness of behaviour change theories in promoting preventive healthcare practices. By meticulously addressing key constructs such as perceived susceptibility, severity, and barriers, the intervention facilitated a significant positive change in attitudes and behaviours towards CCS among WLHIV. Targeting high-volume facilities and underserved

areas strategically proved crucial in reaching the intended population efficiently. Customizing interventions to cater to the specific needs and concerns of WLHIV ensured increased engagement and participation in screening initiatives. A critical factor in the success of the intervention was the comprehensive training provided to healthcare providers. This equipped them with the necessary knowledge and skills to effectively communicate the importance of CCS and address client concerns, thereby building trust and enabling informed decision-making.

In line with our study, a 2012 study by Tavafian underscores how HBM variables have been central to intervention efforts [17]. These initiatives aim to debunk misconceptions, strengthen beliefs, and increase the demand for and utilization of CCS across diverse low-resource settings.

A systematic review supports our findings, highlighting the importance of HBM constructs like perceived benefits and barriers in influencing mammographic and/or Pap screening uptake [18]. This reaffirms the model's relevance for understanding preventive healthcare behaviours and guiding interventions to enhance screening participation rates.

Our study contrasts with Burak's findings [19]. Although Burak's study revealed that the HBM explained a small portion of the variance in screening behaviour and intentions (15% and 11% respectively), it still offered valuable insights into participants' beliefs. Recognizing perceived benefits and barriers can inform tailored interventions, despite the model's predictive limitations.

Moreover, a study in London reveals that the Theory of Planned Behaviour outperformed the HBM in predicting screening intentions, indicating its superiority in explaining variability in behaviour [20]. These findings underscore the need for a multifaceted approach to promoting preventive healthcare behaviours among WLHIV. While behaviour change theories provide valuable frameworks for understanding and predicting health-related behaviours, interventions must also address contextual factors and structural barriers to effectively translate intentions into action. Future studies could benefit from a multi-dimensional approach, integrating diverse theories and considering broader contextual factors to better address the complexities of preventive healthcare practices among diverse populations.

Integrating CCS services into existing healthcare systems is crucial for WLHIV, fostering accessibility and affordability. Collaborative efforts involving government agencies, non-governmental organizations (NGOs), and community stakeholders are essential for sustainable cervical cancer prevention. The study's findings have wide implications, boosting screening uptake and treatment rates among WLHIV, thus alleviating the burden of cervical cancer. By integrating the HBM, the intervention effectively enhances demand and utilization of CCS services, contributing to broader initiatives for better health outcomes in underserved populations.

## Conclusion

This study demonstrates the effectiveness of integrating the HBM into outreach efforts for CCS among WLHIV in Tanzania.

We successfully shifted attitudes and behaviours towards CCS by addressing key HBM constructs and providing comprehensive training to healthcare providers. While consistent with previous research, contrasting findings highlight the need for a multifaceted approach. Collaborative efforts are crucial for integrating CCS services into healthcare systems, ultimately improving health outcomes for WLHIV globally.

## Recommendation

We recommend continued collaboration among governmental agencies, NGOs, and community stakeholders based on our findings. Sustained efforts are vital for integrating CCS services into existing healthcare systems and ensuring their accessibility and affordability for WLHIV. Interventions should be tailored to address the unique needs and concerns of WLHIV.

While behaviour change theories like the HBM provide valuable frameworks, interventions should also address contextual and structural barriers to maximize their impact. A multifaceted approach that considers both individual beliefs and broader socio-economic factors is essential for promoting preventive healthcare practices among WLHIV.

Further research is warranted to better understand and address the complexities of preventive healthcare practices among diverse populations, including WLHIV. Integrating diverse theories and considering broader contextual factors can provide valuable insights for designing more effective interventions in the future.

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## Conflict of Interest

All authors declared no conflict of interest.

## Funding Source

This study received funding from the CDC and AMREF Health Africa, Tanzania.

## Data Availability

Data from this study will be accessible upon request to the corresponding author or can be retrieved from the DATIM repository site.

## References

1. Cervical cancer WPRO
2. Sung H, Ferlay J, Siegel RL, et al. (2021) Global cancer statistics 2020: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA Cancer J Clin* 71: 209-249.
3. Mokhele I, Evans D, Schnippel K, et al. (2016) Awareness, perceived risk and practices related to cervical cancer and Pap smear screening: A cross-sectional study among HIV-positive women attending an urban HIV clinic in Johannesburg, South Africa. *S Afr Med J* 106: 1247-1253.
4. Allahqoli L, Dehdari T, Rahmani A, et al. (2022) Delayed cervical cancer diagnosis: A systematic review. *Eur Rev Med Pharmacol Sci* 26: 8467-8480.
5. Mapanga W, Girdler-Brown B, Feresu SA, et al. (2018) Prevention of cervical cancer in HIV-seropositive women from developing countries through cervical cancer screening: A systematic review. *Syst Rev* 7: 198.
6. Chambuso RS, Shadrack S, Lidenge SJ, et al. (2016) Influence of HIV/AIDS on cervical cancer: A retrospective study from Tanzania. *J Glob Oncol* 3: 72-78.
7. Bray F, Ferlay J, Soerjomataram I, et al. (2018) Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA Cancer J Clin* 68: 394-424.
8. Kafuruki L, Rambau PF, Massinde A, et al. (2013) Prevalence and predictors of cervical intraepithelial neoplasia among HIV infected women at bugando medical centre, Mwanza-Tanzania. *Infect Agent Cancer* 8: 45.
9. World Health Organization (WHO) (2020) Cervical cancer 2019: Early diagnosis and screening of cancer.
10. Poli UR, Bidingner PD, Gowrishankar S (2015) Visual Inspection with Acetic Acid (VIA) screening program: 7 years experience in early detection of cervical cancer and pre-cancers in rural south India. *Indian J Community Med* 40: 203-207.
11. Dartell MA, Rasch V, Iftner T, et al. (2014) Performance of visual inspection with acetic acid and human papillomavirus testing for detection of high-grade cervical lesions in HIV positive and HIV negative Tanzanian women. *Int J Cancer* 135: 896-904.
12. National Guidelines for the Management of HIV and AIDS 6th 2017 - NACP-National AIDS Control Programme.
13. Health Belief Model - an overview | Science Direct Topics.
14. Guvenc G, Akyuz A, Acikel CH (2011) Health belief model scale for cervical cancer and pap smear test: Psychometric testing. *J Adv Nurs* 67: 428-437.
15. National Bureau of Statistics - 2022 Population and Housing Census - Preliminary Report in Swahili Language.
16. (2023) National Bureau of Statistics - The Tanzania HIV Impact Survey 2022-2023 - Summary Sheet.
17. Tavafian SS (2012) Predictors of cervical cancer screening: An application of health belief model. In: *Topics on cervical cancer with an advocacy for prevention*. IntechOpen.
18. Tanner-Smith EE, Brown TN (2010) Evaluating the health belief model: A critical review of studies predicting mammographic and pap screening. *Soc Theory Health* 8: 95-125.
19. Burak LJ, Meyer M (1997) Using the health belief model to examine and predict college women's cervical cancer screening beliefs and behavior. *Health Care Women Int* 18: 251-262.
20. Bish A, Sutton S, Golombok S (2000) Predicting uptake of a routine cervical smear test: A comparison of the health belief model and the theory of planned behavior. *Psychol Health* 15: 35-50.