

A Qualitative Exploration of Barriers to Treatment Among HPV-Positive Women in a Cervical Cancer Screening Study in Western Kenya

Sinéad Isaacson^{*1, }, Konyin Adewumi², Jennifer S. Smith¹, Carissa Novak³, Sandra Oketch⁴, Megan J. Huchko^{2,5}

¹Epidemiology Department, Gillings School of Global Public Health, University of North Carolina at Chapel Hill, Chapel Hill, NC, USA

²Duke Global Health Institute, Duke University, Durham, NC, USA

³Harvard Global Health Institute, Harvard University, Cambridge, MA, USA

⁴Kenya Medical Research Institute, Nairobi, Kenya

⁵Department of Obstetrics and Gynecology, Duke University School of Medicine, Durham, NC, USA

*Corresponding author: Megan J. Huchko, MD, MPH, Duke Global Health Institute, Duke University, Durham, NC, USA. Email: megan.huchko@duke.edu

Abstract

Background: Cervical cancer screening through self-collected high-risk human papillomavirus (HPV) testing has increased screening uptake, particularly in low-resource settings. Improvement ultimately depends, however, on women with positive results accessing follow-up treatment. Identifying the barriers to timely treatment is needed to tailor service delivery for maximum impact.

Materials and Methods: This qualitative study was conducted within a self-collected HPV screening trial in Migori County, Kenya. HPV-positive women were referred for no-cost cryotherapy treatment at the county hospital. Women not attending within 60 days of receiving HPV-positive results were randomly selected for in-depth interviews (IDIs). IDIs were coded and analyzed to develop an analytical framework and identify treatment barriers.

Results: Eighty-one women were interviewed. IDIs showed a poor understanding of HPV and cervical cancer, impacting comprehension of screening results and treatment instructions. All 81 had not undergone treatment but reported intending to in the future. Eight reported seeking treatment unsuccessfully or not qualifying, primarily due to pregnancy. Transportation costs and long distances to the hospital were the most reported barriers to treatment. Other obstacles included work, household obligations, and fear of treatment. Impacts of social influences were mixed; some women reported their husbands prevented seeking treatment, others reported their husbands provided financial or emotional support. Few women experienced peer support.

Conclusions: Women faced many barriers to treatment following HPV screening in rural Kenya. Transportation barriers highlight a need for local treatment capacity or screen-and-treat approaches. Ensuring women understand their results and how to seek treatment is essential to improving cervical cancer screening in low-resource settings.

Key words: cancer screening; HPV screening; cervical cancer screening; health behavior; treatment adherence and compliance; patient participation; patient dropouts; qualitative research.

Implications for Practice

This study conducted in-depth interviews with HPV-positive women who did not attend treatment visits following self-collected cervical cancer screening. The barriers to timely treatment identified by this study provide information to aid those conducting screening and treatment in improving follow-up attendance and supporting patients. Poor understanding and misinformation in this population indicate the need to focus on effective communication of screening results and treatment instructions. The impact of distance to the treatment location and transportation cost indicates a need for local treatment capacity.

Introduction

Cervical cancer is highly preventable through vaccination and screening, yet remains “one of the greatest threats to women’s health,” according to a recent call to action from the Director-General of the World Health Organization (WHO).¹ Women in low- and middle-income countries (LMICs) are disproportionately impacted by cervical cancer incidence

and mortality.^{4–6} In Kenya, where cervical cancer is the second leading cause of cancer morbidity and mortality among women, the age-standardized mortality rate is 22.8 per 100 000, vs. 1.9 in the United States.² The disparity is primarily due to differential enactment of prevention measures, such as screening programs.^{4–6} Limited resources and strategic challenges resulted in The Kenyan Ministry of Health describing

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the implementation of a national screening program as “haphazard,” resulting in “negligible” screening coverage.³

LMICs frequently lack the infrastructure and resources to successfully implement effective screening programs for the early detection of cervical cancer.⁴ Testing for high-risk types of human papillomavirus (HPV) that cause cervical cancer^{5,6} is an effective⁷⁻¹³ and affordable^{4,7,13} alternative screening method and is recommended for use in LMICs by the WHO.¹⁴ HPV testing also provides women the option of using self-collection to obtain cervicovaginal samples. This facilitates screening among women otherwise hard to reach by eliminating the need for a health facility, trained provider, or pelvic exam.^{15,16}

While HPV testing facilitates strategies that can improve screening uptake, women with positive HPV screening results will need follow-up care to check for and remove cervical pre-cancerous lesions, and substantial barriers remain in following up a positive screening result with secondary diagnoses and treatment.^{17,18} Without a same-day, point-of-care HPV test, multiple interactions with the healthcare system are required: testing, result notification, and, follow-up care. Women face a wide variety of barriers in each of these interactions, leading to dropouts from the screening process. Lack of timely follow-up is common even in countries with well-established screening programs, with loss to follow-up estimates often ranging from 20% to 40% of women with positive cytology results.¹⁹⁻²¹ Yet, although previous research has produced a body of evidence on improving screening methods in LMICs,^{22,23} and specifically in western Kenya, little is known about follow-up among women with positive HPV screening results.²⁴

The gap in research identifying effective strategies to link screen-positive women to follow-up in LMICs is especially important as more countries adopt HPV testing. As screening becomes more widely available to populations with lower healthcare access, it is critical to improving understanding of the barriers to follow-up care. This study sought to explore the perspectives of women who underwent self-collected HPV testing, received a positive result with a request to attend follow-up, and did not present within 60 days. We used in-depth interviews (IDIs) to develop an analytical framework to examine the barriers, beliefs, social norms, and logistical factors that contributed to women’s access to and decision-making about treatment.

Materials and Methods

Source Population

This study was conducted within an ongoing cluster-randomized trial comparing strategies for implementing cervical cancer screening using self-collected HPV testing. The parent trial was set in Migori County, in the Nyanza Province of Western Kenya, with a population of 1.1 million people.^{25,26} Migori County is primarily rural and impoverished.²⁷ Health outcomes are poor; the area has the highest under-5 mortality rate and the fourth highest HIV prevalence in Kenya.^{28,29}

In the parent trial, 12 communities were randomized to offer screening in either community health campaigns (CHCs) or clinics. In both arms, eligible women 25-65 years old were offered screening using self-collected sampling with the careHPV test (QIAGEN Group, Maryland). The careHPV test detects high-risk HPV DNA and has been demonstrated to be effective in resource-limited settings, including use via

self-collection in Africa.³⁰⁻³² Women were eligible regardless of cervical cancer screening history. The trial included a cervical cancer education module, training in the use of the self-collection device, and all participants were provided with a phone number where they were able to ask study staff about their HPV result, treatment details, or logistics.

Women selected their preferred result delivery method: text message (SMS), phone call, in-clinic pick-up, or community health worker (CHW) home visit [Appendix]. Women who tested positive for HPV were instructed to visit Migori County Hospital for evaluation of disease severity and treatment with cryotherapy, if indicated, free of charge. Women not eligible for treatment due to pregnancy were told to wait until 2 months after delivery. Migori Hospital is the only referral hospital in Migori District and is a median distance of 51 km from study communities, which women could travel using private or, more typically, local transportation (eg, matatu, paid motorbike hire). This study examines baseline barriers to treatment prior to phase II of the parent trial, which assessed an enhanced linkage to treatment strategy.

Data Sources

Women were classified as eligible if they did not present for treatment at Migori Hospital within 60 days of receiving their HPV-positive result, a common cut-point for high-risk follow-up.^{20,33,34} No other facilities in the county offered free treatment, besides sporadic outreach campaigns for high-risk women, making women unlikely to have sought treatment elsewhere. To create a sampling frame for this study, we included the 4 CHC-based communities at least 60 days past result notification at the time and randomly selected 4 clinic-based communities, as clinic testing was ongoing. Eligible women in these communities were selected using simple random sampling until 10 were interviewed per community.

Staff called to schedule IDIs or located women in-person if they did not have a phone or could not be reached. Female interviewers have trained in interview best practices and conducted IDIs in-person, at a private location of the interviewee’s choosing, and recorded audio on tablets. IDIs followed a guide of open-ended questions exploring key themes, for example, “*Can you describe any factors that made accessing treatment difficult for you?*” The IDI guide followed the format of IDI guides used in the parent trial and was developed in English, then translated, tested, and implemented in local languages (Dhluo and Kiswahili). Recordings were transcribed and translated into English by certified translators, and transcripts were verified with accompanying audio by the study coordinator. Demographic data was entered into Open Data Kit database software (opendatakit.org) on tablets during interviews.

Data Analysis

Based on the authors’ research experience in Migori and a review of the literature,^{19,21,35} we developed a qualitative analytical framework, which evolved during the research process based on IDI findings [Fig. 1]. Employing qualitative content analysis, we explored the logistic, psychological, and social barriers and facilitators to treatment that women discussed during IDIs.³⁶ Two members of the research team drafted a codebook using the IDI guide and 10 randomly selected interviews to identify themes. The codebook was then reviewed and revised by the research team, and tested through sample coding of 10 new interviews by the 4 coders. Inter-coder

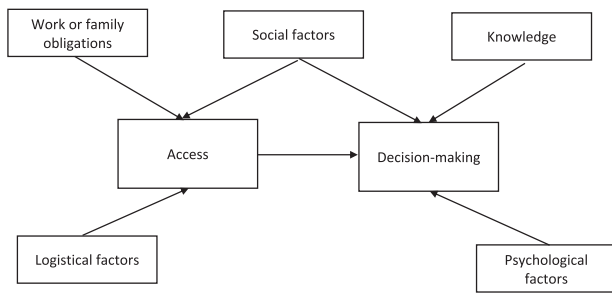


Figure 1. Qualitative analytical framework.

reliability exercises and discussion of areas of nuance refined the final codebook. All IDIs were then coded twice by separate members of the research team using NVivo 11 software. Coding reports were reviewed collaboratively to develop emerging themes and identify patterns.

Women who sought treatment by the time of interview, but not in the 60 days post-notification, were included in this analysis to allow consideration of factors causing treatment delay. When women reported not receiving their results, we examined result delivery records for more information. If records indicated a woman did receive her result, the IDI was included to allow examination of the role of result communication and comprehension in non-adherence. If records corroborated a woman had not received her result, this was assumed to be her primary barrier to treatment, and data from the IDI was not included in our analysis of barriers to those aware of their recommendation to seek treatment.

Ethical Approval

This study was approved by the ethical review boards at the Kenya Medical Research Institute, Duke University, and the University of California, San Francisco. Interviewers discussed informed consent in person with potential participants in local languages, including a verbal reminder that this is a voluntary activity and notification that the interview would be recorded. All participants gave written informed consent. All study tables were password protected and all data collected were transferred daily to a secure server.

Results

At the time of sampling, 425 HPV-positive women were identified as not undergoing treatment within 60 days of receiving results from CHC-based communities ($n = 209$) and clinic-based communities ($n = 216$) [Fig. 2]. Of the 111 women randomly selected, interviewers completed IDIs with 81 women (73%) with most IDIs lasting 30–45 min. The median age of women interviewed was 35 years, the median number of children was 4, and 67% were married [Table 1]. None had sought treatment at another health facility. Eight women had exclusive primary barriers, having sought treatment unsuccessfully and/or not qualifying; 6 were pregnant and one was not treated due to equipment malfunction. Therefore, interviews with 73 women were included in the analysis of other treatment barriers.

Screening and Treatment Intentions

Women generally provided multiple reasons for having undergone screening. Most frequently, women reported having wanted to know if they had HPV. Many were motivated by

the convenience of the parent study's screening campaign or the campaign's outreach. "I had never been screened, but I did it since it was brought nearer—at my doorstep. It was within my reach." Health concerns or recommendations by health-care professionals also motivated screening. Peer encouragement and self-collection were less frequently mentioned, but were important factors for some women:

I thought it could be painful, but I came to learn it is simple. You insert it the way you want.... Those who already screened encouraged us to go. After I screened, I also went and told those who had not gone to go, because it is a good thing.

While women underwent screening for many reasons, there was an overwhelming desire to know their health status and an interest in health improvement, both potential motivators for seeking follow-up treatment. Almost all women interviewed who had not yet sought treatment reported that they did intend to do so. Women often reported knowing they were at risk of cancer.

Barriers to Treatment

Barriers to treatment included (1) logistical difficulties, including distance to the treatment site and costs of transportation; (2) work and family obligations; (3) lack of knowledge and understanding of HPV and the cervical cancer prevention process; and (4) social and psychological influences (Table 2).

Logistical Barriers

Reaching Migori Hospital was the key barrier for most women. Participants cited the financial burden that comes with traveling the long distance to Migori Hospital as their primary barrier to treatment. Asked about her plans for treatment, one woman responded, "Since I will be charged a lot to come to Migori it will take me a week to get enough money for transportation." When women described money as a barrier to seeking treatment, they were typically referring to money to fund transportation. "Simply because of the money. ... The most difficult one is the means of transport." Taking time off of money-generating activities during treatment and recovery also presented a financial barrier for some women. Interviewees described already not having enough income to support their family's needs:

The problem is money. Life is so hard at the moment. It is hard to ensure your family has enough to eat when you are one person and at the same time divide the little you have for transport. If you [seek treatment], the children will stay hungry; when you get back, they will still look up at you.

Women faced other logistical barriers to seeking treatment. Many women appeared to lack crucial information, such as how to schedule a follow-up appointment. At the conclusion of their interview, many women wanted additional information on the details of seeking treatment, including where in the hospital to go, treatment cost, and details about what to expect.

Some women reported facing logistical barriers within the healthcare system. Nine women were confirmed to have never received their results, 2 women reported medical equipment

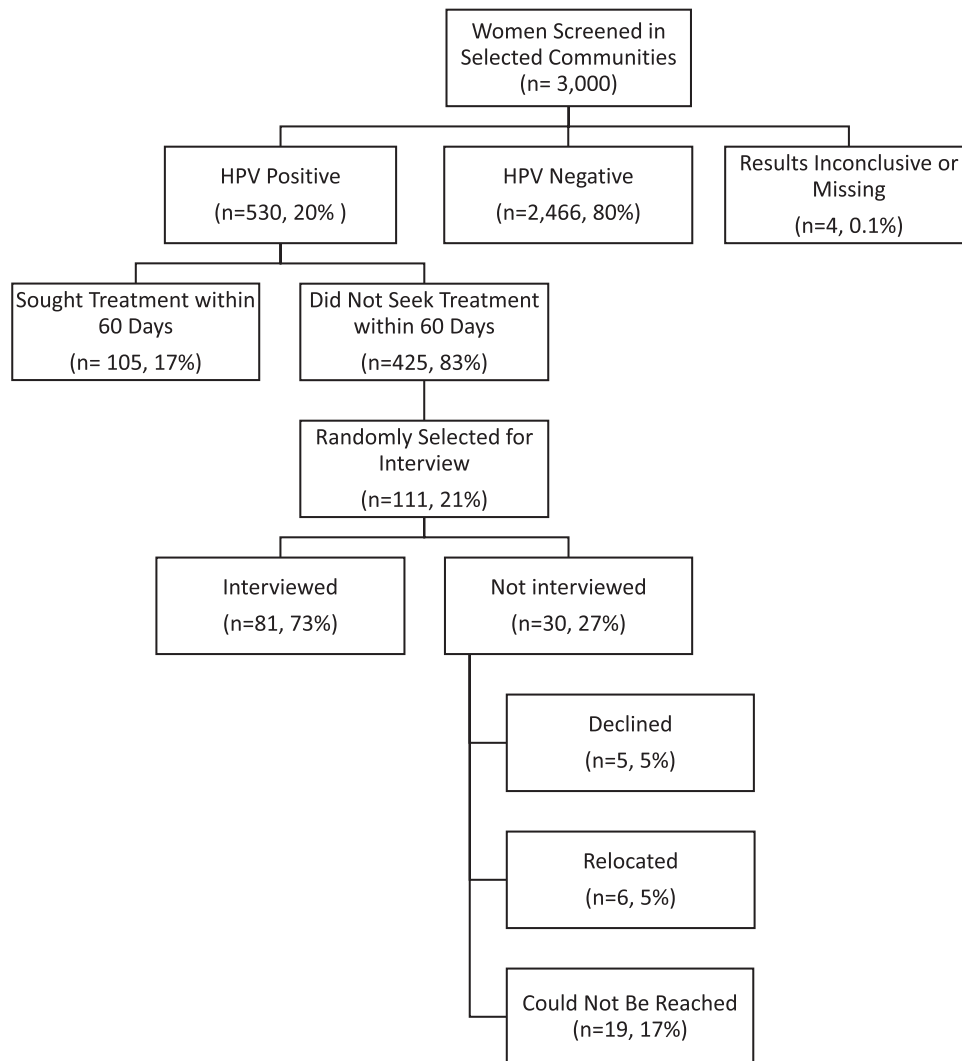


Figure 2. Flow chart of screening, result, and treatment numbers for 3,000 female participants in selected Western Kenyan communities with 60 days of follow-up as of random sampling.

was not working, and 2 women reported the clinic phone line was not answered. In these cases, this was considered their primary barrier to treatment, and these women were not included in the analysis of other barriers.

Work and Family Obligations

Women frequently reported work as a barrier. “I had a patient and was taking care of her in the ward. I could not leave her, and that’s why I have not come for treatment.” Women described the challenges involved with asking their employer for time off to seek treatment: “We are few workers, so she rarely accepts [time off] unless I lie.” Some women also reported fear that they would not be able to work after treatment: “Someone went for treatment... and now she cannot do any hard work. So, I worried, because my source of income is farm work. I have a child in school and I raise her fees through farm work.”

Family and household obligations, including childcare, were mentioned as barriers, although typically other barriers were more problematic. Some women expressed that seeking treatment should take precedence over household responsibilities. “Chores are not a priority. Life cannot be compared

to other duties, since if you die, you leave the household duties.”

Lack of Understanding of HPV and Cervical Cancer Prevention

Poor understanding of HPV and its relationship to cervical cancer pathogenesis was common. Participants rarely directly expressed that they had poor understanding, rather, misperceptions became apparent during IDIs. Misunderstanding of screening results and the treatment process were common and prevented some women from seeking treatment. A few received results that were not delivered clearly enough for the participant to understand. One said, “I was only told to go to Migori district hospital, so I do not have an idea about my results.”

Women mentioned a variety of misconceptions about HPV and cervical cancer which may have been barriers. Common misconceptions included that women of childbearing age should not be treated for HPV and that treatment came in the form of taking medication: “Is HPV curable? Does it disappear with time or will one be taking pills on a daily basis like with HIV?” Other misunderstandings included an inability to differentiate HPV-positivity from a cervical cancer diagnosis, and occasional confusion between HPV and HIV.

Table 1. Characteristics of interviewed women with HPV-positive screening results who had not sought treatment within 60 days (n = 81)

Characteristic	Median (range) or n (%)
Age in years	35 (25-59)
Relationship status	
Married	52 (67%)
Widowed	25 (32%)
Single	1 (1%)
Number of children	4 (0-9)
Screening location	
Campaign	44 (56%)
Clinic	34 (44%)
Notification method	
Text message	11 (20%)
Phone call	12 (22%)
Visit from CHW	21 (39%)
Return to clinic	10 (19%)

Abbreviations: CHW, community health worker; HPV, human papillomavirus.

A lack of information was also evident from questions women asked at the end of the IDI. A number had questions about basic aspects of HPV, how they may have been infected, and symptoms they were experiencing: “I would like to ask the signs and symptoms when HPV-positive. Is there pain that one feels?” Despite this lack of information, few women mentioned having called the parent study’s informational phone number.

Social Influences

Male partners, family members, peers, and the wider socio-cultural context influenced participants’ treatment-seeking behaviors. Although most women reported receiving financial or emotional support from their partners, some described their partners as a barrier to treatment. When asked about factors impeding treatment access, one woman replied, “[husbands] are very hard to deal with. You have to tell them where you are going.” In a few cases, lack of knowledge about HPV meant partners did not support treatment:

It has taken a while because my husband complains... Sometimes he feels it is not real and other times he feels it is a way of going for family planning. Men think these are diseases we get on our own; they do not understand that they are also a part of it.

One participant described her partner as supportive, but when asked if she knew anyone whose partner would prevent treatment, she responded, “There are so many. When [women] leave home, [husbands] think they are unfaithful.” Many women had not told their partners about their positive screening results.

Other social influences were typically discussed in a negative context. Women rarely reported receiving social support from peers or other community members. A small number of women reported that people in their community discouraged them from seeking treatment. One woman said that

after receiving her results, “Some people tried to discourage me from going, saying that there is no way one can be told they are sick when they look very healthy. That they were just going to kill me.” Our assessment of indications of stigma in the interviews found that while most women did not report stigma or embarrassment, a few were worried that others in their community would find out if they sought treatment.

Fear

Fear emerged as a theme throughout the IDIs, varying from fear of screening, results (“I understood my result, only I have some fear”), cancer and illness, or treatment. Fear of having cancer acted as a barrier to deciding to seek treatment: “When you screen and are found to be positive, you might think that you already have full-blown cancer. So, you might find it difficult to seek treatment. It might make someone be afraid.” Participants also discussed fear of treatment itself. In a socio-cultural context, the treatment experiences of others in the community discouraged some women from seeking treatment as “I was scared from what I heard people say.” One woman reported a treated woman told her, “There is bleeding and smelly discharge and severe abdominal pains. This caused my delay.”

Treatment Facilitators

Treatment facilitators recommended by women fell under the categories of decision-making support and strategies to improve access.

Decision-Making

Women felt greater knowledge, from peer education or healthcare providers, could play an important role in treatment decision-making. Many participants wanted their peers to encourage others in the community to seek treatment by sharing their experiences and felt they could do so themselves after being treated. Additional counseling and education on the disease and treatment from healthcare providers was also frequently recommended, as women commonly felt they were not equipped with enough information. “When a health talk is brought to the community... people will be aware. If one has a feeling that [she] needs to be treated, she knows what to do or where to go.” Some women also wanted healthcare professionals to provide encouragement and alleviate fear and stigma. Women frequently encouraged the inclusion of men in counseling and education sessions. “When you are giving the health talk, men should also be included. The wife [may] have an easy time while seeking treatment when the husband has undergone health education about HPV.” Women felt men would be more receptive to information if it came from a healthcare provider.

Access

The most commonly suggested potential facilitators to treatment were providing transportation or transportation vouchers, and providing treatment closer to the community. These addressed the most commonly identified barriers to seeking treatment: the cost of transportation and distance to the health facility.

When asked about the use of reminders as a facilitator, women responded positively, recommending the use of reminders through either text messages or home visits. Asked about the role of community leaders, women envisioned a

Table 2. Themes and quotes from interviews with Western Kenyan women with HPV positive screening results who had not sought treatment within 60 days

Themes	Example quotations
Logistical barriers	<p>“I called but the number was not being received so I could not come because we were instructed to call before going to Migori District Hospital.”</p> <p>“There was a time I was to come for treatment, so I called the number and was told that there was a problem with the machine. Since then I have been reluctant to go for treatment.”</p>
Cost, distance, and transportation	<p>“The only difficulty I can face is money. My source of income is selling sugar cane. For me to get six hundred shilling from selling the sugarcane, even after four days, can be difficult. Like now things are so difficult, you can only make like fifty shillings which you will use for food. So by the time you get six or seven hundred shillings, it is very difficult.”</p> <p>“I just want to go for treatment if you can give me money or if you tell me what to do so that I can access treatment even if you say I go tomorrow, I will go. If I got money even today, I can just go.”</p> <p>“When I heard about going for treatment, at first, I did not know how the treatment was going to be done. I just knew people were going for clinic. What worried me was how I would get money to go there. I am a widow and had to raise this money by myself. ... That is the only thing that worried me, I was not worried about the treatment.”</p>
Work and family obligations	<p>“It is all about getting permission from my employer and transport.”</p> <p>“There is someone who had gone for treatment ahead of me and as per now, she cannot do any hard work. So, I feared because I have a child in school and I raise her fees through farm work. It has really disturbed me because I feel it will interfere with my work”</p>
Lack of information or misconceptions	<p>“I have never heard about [HPV/ cervical cancer]before, I only heard about it from you.”</p> <p>“I do not know [what my result means] because after the test results were out I was only told to go for treatment which means I am sick.”</p> <p>“There are a lot of women in my community. They feel that once they are treated they may not be able to give birth again. Infact, that is one of the things I wanted to ask you. Is it advisable to bear children again if you are found with [HPV]?”</p> <p>“Is cervical cancer different from HIV because when I hear people speak it is something different?”</p> <p>“[Husbands] feel family planning is the cause of these diseases.”</p>
Social influences	<p>“Some people tried to discourage me from going saying that there is no way one can be told that they are sick when they look very healthy, that they were just going to kill me.”</p> <p>I did not seek treatment because those who came back from there instilled fear in me.”</p> <p>“It has taken a while because sometimes I wish I could come but my husband complains”</p> <p>“I have difficulty with getting the money. That is why I have not come. The man I live with is difficult to deal with. He can even ask me where I got the cancer from or who infected me because he does not know.”</p> <p>“I hear people say that when you are from treatment you have problems like you cannot walk properly, you cannot work and thus making it difficult for some men.”</p>
Fear	<p>“When someone gets to hear that they have cancer, they can be shaken. I was shaken too when I heard it at first. When you screen and found to be positive, you might think that you already have the full-blown cancer. So, you might find it difficult to seek treatment. It might make someone to be afraid.”</p> <p>“I was scared from what I heard people say.”</p>
Treatment facilitators	<p>“If there were a means of transport or reimbursement it would make it easier for [women] to come for treatment.”</p> <p>“Get this, some of us are fond of being paid in everything they engage themselves to. Some maybe were thinking they were to be paid after the procedure. I tend to disagree with them; the reward should be we were treated when we were sick freely.”</p> <p>“There are some who go to screen and when the results are out, they ask their husbands to escort them but they talk back negatively until they feel demoralized, but if you come and talk to them, they agree because of fear since they get to understand that there will be consequences if they don't support their wives.”</p> <p>“... you can just talk to her, ask her whether she has gone for cervical cancer screening, and if she hasn't you can advise her to go because the problems she is experiencing might be because of cervical cancer, and if that's the case they can find a way of how to prevent it before it progresses.”</p>

possible role in providing transportation or encouraging women to seek treatment. “Women will not see it as a stigma to the society if the community leaders encourage and talk to them. ... If there is no one to create awareness, there is stigma in the society.” Several women discouraged the involvement of community leaders, citing an inability to maintain confidentiality.

Discussion

This study explored the barriers faced by women in Western Kenya who tested positive for HPV but had not accessed the recommended, free follow-up care and treatment within 2 months of receiving their results. Women identified factors that influenced their decision to seek treatment as well as factors that impeded their access to the treatment. The costs of

transportation and distance to treatment site were the most frequently mentioned barriers to treatment access, although confusion about the significance of an HPV test, lack of social support, and fear of treatment played into women's decision not to seek treatment. Increasing uptake will require both addressing women's decision-making and removing the substantial logistical barriers to treatment access.

The distance between the 8 study communities and Migori Hospital, where treatment was offered, is a challenge exacerbated by poor road conditions and lack of access to transportation. Distance-decay effect, where the increased distance from between patients and health facilities results in lower healthcare utilization, is shown to be influential in a variety of settings, including in Western Kenya.³⁷⁻³⁹ The financial burden of transportation cited by women in this study echoes previous research in this region. Quantitative and qualitative⁴⁰ findings in Western Kenya indicate that transportation and its cost are reasons caregivers fail to bring children for healthcare or abandon pediatric cancer treatment; with parents reporting travel to the hospital to be expensive, time-consuming, and difficult.³⁷ Transportation challenges have been repeatedly identified as a barrier to antiretroviral therapy adherence in Western Kenya,⁴¹⁻⁴³ with transport costs among the top reasons for missed clinic visits.⁴⁴ In cervical cancer research, geographical inaccessibility has been cited as a central barrier to accessing cervical cancer services.³⁹ A cervical cancer project in Western Kenya found distance and transportation costs impacted women's participation in screening and follow-up.³⁹ There is a demonstrated need for local treatment capacity and feasible screen-and-treat approaches. Strategies addressing remote treatment centers should be explored, including decentralization or treatment vouchers.

Lack of information (including not understanding results and not knowing how to seek treatment) was not often directly mentioned as a barrier but was a recurring theme in interviews. Clear and informative results delivery is needed to provide more information to both make a decision about treatment and to successfully access treatment. Limited knowledge about cervical cancer, HPV, and preventive services has been described as a barrier to care in a variety of settings, with an understanding of cervical cancer linked to greater use of prevention resources.⁴⁵ Our finding is supported by studies in Western Kenya, describing low cervical cancer knowledge among women and identifying lack of information as a barrier to cervical cancer screening.^{46,47} Similar to the misunderstanding expressed by a few women in this study, other studies in Western Kenya have identified confusion between HPV screening and HIV screening.³⁹

Women reported varied social support from their community, peers, and male partners. Studies have supported the important role men play in cervical cancer prevention in Western Kenya, providing both emotional and financial support. Focus groups with men and women in Nyanza province identified "concerns about marital discord, separation, and spousal abandonment" as screening barriers.⁴⁶ In another study, women in Western Kenya did not attend a screening or follow-up visits because their husbands provided little support or were actively opposed.³⁹ Partners' lack of understanding and sociocultural norms were barriers, with women reporting difficulty getting money for transportation from their husbands since they felt healthy and were not visibly ill, an identical experience described by some women in another Kenyan study.³⁹

Fear was the strongest psychological factor mentioned as a reason for delaying treatment, including fear of cancer and of treatment. This finding aligns with the current literature, where fear has been reported as a barrier to cervical cancer prevention services in many African countries.^{35,39,45} Kenyan women have previously described fear impacting cervical cancer screening behavior, reporting fear of pain or discomfort during screening, receiving positive results, the inevitability of cervical cancer, and the severity of treatment.^{39,46}

Two of our findings are not as robustly supported by the existing literature. To our knowledge, we are the first to report HPV-positive women identifying work obligations directly as an important barrier to cervical cancer treatment in Western Kenya. Time constraints have been reported as barriers, with domestic workload identified as a primary treatment barrier in Buenos Aires and competing demands for time and money outlined as a challenge in sub-Saharan Africa.^{48,49} Results are not consistent, however, with a study in rural Argentina finding work and household workload were minimal barriers to care.⁵⁰ Similarly, while studies have cited stigma as a barrier to accessing cervical cancer services,^{35,45} stigma was infrequently cited as a concern for women in this study. Our findings are in line with a recent quantitative study in rural western Kenya, which found low cervical cancer stigma.⁵¹

The 73 women included in this study provide a particularly large sample size of women lost to follow-up, a group who are inherently difficult to reach, allowing us to obtain valuable information on barriers to follow-up care from a rarely sampled group. Nonetheless, a potential limitation of our study is that the women facing the largest barriers may be those we could not locate to interview. Additionally, respondents' answers may have been influenced by a desire to provide favorable responses to questions. For example, women who had not sought treatment by the time of the interview almost always reported intent to seek treatment, despite not having done so for at least 60 days. Next, while most women reported understanding their screening results, we lacked a tangible metric to discern how well they understood their results and treatment instructions. Finally, all women enrolled in this study were part of the parent trial intervention, and it is possible that women undergoing typical cervical cancer screening will face different treatment barriers. Of note, although this study identified factors influencing decision-making and those influencing treatment access, this separation was purely for purposes of this analysis, and concerns about access could certainly play a role in women's decision-making around seeking treatment.

Conclusion

Women in Western Kenya face various challenging barriers to seeking treatment following positive cervical cancer screening results, with the costs and logistics of transportation to central treatment sites paramount. This highlights the need for decentralized treatment resources and the development of feasible single-visit screen-and-treat approaches. Furthermore, women's lack of HPV knowledge emphasizes the importance of effective messaging to accompany the delivery of screening results. Women overwhelmingly expressed an interest in treatment, suggesting more women likely would seek treatment if the multiple layers of barriers can be effectively addressed.

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Conflict of Interest

The authors indicated no financial relationships.

Author Contributions

Conception/design: S.I., K.A., J.S.S., C.N., M.J.H. Provision of study material or patients: S.I., S.O., M.J.H. Collection and/or assembly of data: S.I., S.O. Data analysis and interpretation: S.K., K.A., C.N., M.J.H. Manuscript writing: S.I., K.A., J.S.S., C.N., M.J.H. Final approval of manuscript: All authors.

Data Availability

The data underlying this article will be shared on reasonable request to the corresponding author.

Appendix: HPV screening result delivery messages used in parent trial.

HPV result	Delivery method	HIV negative	HIV positive
Negative	Phone call	My name is.....Thank you for taking cervical cancer screen test! Your result was negative. Visit your nearest clinic after five years for another test. Please call or flash 0790....if you have any questions.	My name is.....Thank you for taking cervical cancer screen test! Your result was negative. Visit your nearest clinic after one year for another test. Please call or flash 0790....if you have any questions.
	SMS	[Participant Name] Thank you for taking the cervical cancer screening test. Good news—your result was negative. Visit your nearest clinic after five years (2021) for another test. Please call or flash [study number] if you have questions.	[Participant Name] Thank you for taking the cervical cancer screening test. Good news—your result was negative. Visit your nearest clinic after one year (2017) for another test. Please call or flash [study number] if you have questions.
Positive	Phone call	My name is.....Thank you for taking cervical cancer screen test! Your result showed that you have HPV. Please visit your nearest health facility to talk about treatment options. Please call or flash 0790.... if you have any questions.	Same as HIV negative
	SMS	[Participant Name] Thank you for taking the cervical cancer screening test. The results showed that you have HPV. Please come to Migori County Hospital to talk about treatment options. Call or flash [study number] if you have questions.	Same as HIV negative
Indeterminate	Phone call	My name is.....Thank you for taking cervical cancer screen test! Sorry that we were not able to evaluate your sample. We would like to collect another sample from you. Please call or flash 0790.... if you have any questions.	Same as HIV negative
	SMS	[Participant Name] Thank you for taking the cervical cancer screening test. Sorry that we were not able to evaluate your sample. We would like to collect another sample from you. Call or flash [study number] if you have questions.	Same as HIV negative

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