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ORIGINAL PAPER

Factors Enhancing Utilization of and Adherence to Prevention of Mother-to-Child Transmission (PMTCT) Service in an Urban Setting in Kenya

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Abstract Despite expansive scale-up of prevention of mother-to-child transmission (PMTCT) of HIV services in Kenya over the last decade, Kenya remains one of the countries contributing to high numbers of children living with HIV globally and is among the 22 PMTCT global plan priority countries. Using structured and in-depth interviews this study examined enabling factors that enhance utilization of and adherence to PMTCT services in an urban setting in Kenya. HIV-positive birthmothers (N = 55) whose infants were HIV-negative at the time of the study completed a structured interview and a subset (n = 15) participated in in-depth interviews. The majority of the mothers (98 %) delivered at a health facility and 91 % exclusively breastfed. Further, 91 % attended clinic appointments regularly and 69.1 % strictly adhered to prescribed medication dosage and schedules. However, 18 % had not disclosed their HIV status to anybody, 27 % did not use condom during sex, 95 % did not participate in AIDS support groups and 53 % of their male partners were not involved in PMTCT. Four key themes facilitating PMTCT success emerged from the qualitative data: supportive counseling, striving for motherhood, assurance of confidentiality; and confirmation, affirmation and admiration. HIV/AIDS related stigma and gender imbalances create many missed opportunities for HIV-positive mothers to reach out for support from family and community, apply acquired knowledge and access more affordable care. To be successful, PMTCT programs should be aware of these factors and ensure that mothers are provided with culturally competent care.

Keywords PMTCT · Vertical transmission · Adherence · Health services utilization · Pediatric HIV · Kenya

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Introduction

In 2011, approximately 330,000 children under the age of 15 became infected with HIV and an estimated 230,000 died (69 %) from AIDS [1]. Over 90 % of these infections were a result of mother-to-child transmission and among children living in sub-Saharan Africa, which is home to 92 % of the world's HIV-positive pregnant women [1]. Concerted global efforts towards achieving the 2015 millennium development goal of reducing childhood mortality by two thirds from the 1990 s levels [2], have led to substantive expansion of prevention of mother-to-child transmission (PMTCT) services in the past decade particularly in sub-Saharan Africa [3].

Mother-to-child transmission of HIV infection can occur during pregnancy, labor, delivery or breastfeeding. In the absence of interventions transmission rates range between 15 and 45 % (5–10 % during pregnancy, 10–20 % during labor and delivery and 5–20 % through breastfeeding) [4]. Evidence-based PMTCT strategies can reduce the risk

level to less than 2 % in non-breastfeeding populations, and 5 % or less in breastfeeding populations [4–6].

In high-income countries mother-to-child transmission has been virtually eliminated as a result of effective voluntary counseling and testing, access to antiretroviral therapy, safe delivery practices, and the widespread availability and safe use of breast-milk substitutes [7, 8]. According to the latest data, significant progress has been made in delivering PMTCT services in low- and middle-income countries [1, 6]. However, much work remains to be done to optimize the uptake and outcome of PMTCT programming in resource constrained settings [5, 7–9].

Kenya, like many other sub-Saharan African nations, has made some commendable strides on scaling-up PMTCT services. Since the launch of PMTCT and pediatric HIV treatment and care programs in Kenya in the year 2000, there has been a substantial scale-up, with 4,000 (90 %) of the 4,400 facilities with maternal child health services offering PMTCT services in 2010 [10]. Approximately 63 % of pregnant women were tested for HIV in 2009 [10]. The proportion of pregnant women living with HIV who are on antiretroviral drugs (ARVs) for PMTCT increased from 24 % in 2004 to 72 % in 2009 and that of HIV-exposed infants from 20 % in 2004 to 49 % in 2009 [10, 11].

Despite the strengthened commitment and remarkable PMTCT scale-up [6], researchers discovered that the effectiveness of these services—as measured by HIV-free child survival—in Africa is far from optimal. For instance, expanded coverage of PMTCT services in Kenya notwithstanding, a United Nations General Assembly Special Session (UNGASS) country report in 2010 estimated that 1 in 5 (20 %) babies born to HIV-infected mothers in Kenya are infected with HIV [11]. Further, an estimated 220,000 children were living with HIV in 2011, with approximately 13,000 new child infections that year, most of which were a result of mother-to-child transmission [12]. As such, Kenya remains one of the countries contributing to the high numbers of children living with HIV globally [10] and among the 22 top PMTCT global plan priority [6].

Sub-optimal performance of PMTCT programs has been attributed to maternal non-adherence [13–15] and high levels of attrition along the PMTCT continuum of care—also known as the PMTCT cascade [16–21]. Maternal non-adherence and loss to follow-up is attributed to inadequate knowledge of PMTCT services, mother-to-child transmission, and HIV in general [22, 23]. Inadequate knowledge in the context of PMTCT programming has been linked to low socioeconomic factors such as education and poverty [24, 25]. Women from poor backgrounds and with low literacy levels were found to be prone to misconceptions of HIV treatment and more likely to experience difficulty administering infant ARVs and confused about infant feeding guidelines [5, 26]. HIV related stigma is another key factor associated with PMTCT failure. Researchers indicated that the fear and discrimination attached to HIV impedes testing and disclosure, limits male involvement in PMTCT programs, contributes to maternal and infant non-adherence to ARV drugs, and ultimately inhibits utilization of PMTCT interventions [5, 26–28]. Poor healthcare facilities and services have been linked to sub-optimal performance of PMTCT programs [22, 27]. Further, cultural norms and practices may affect acceptability and hence efficiency of PMTCT interventions.

While our understanding of PMTCT failures is critical to the development of more effective PMTCT programs, equally important are the success stories. However, available research primarily focuses on factors associated with noncompliant women and little is known about compliant women and attributes of those who succeed. It is the authors' contention that important insights into PMTCT compliance can be learned through a deeper understanding of what works for women who are HIV positive.

The purpose of this study was to explore enabling factors—individual, social and structural—that enhance utilization of and adherence to PMTCT services in a plural urban setting in Kenya. Specific objectives of the study were two-fold: (i) to assess PMTCT utilization and adherence characteristics among HIV positive women who had successfully birthed HIV negative infants, and (ii) to examine reasons for PMTCT success as explained by women receiving care at St. Mary's Mission Hospital in Nairobi Kenya.

Methods

Setting

This study was conducted between October and December 2012 at St. Mary's Mission Hospital, Lang'ata—in the outskirts of Nairobi in Kenya. The hospital has an inpatient capacity of 350 beds and serves about 250,000 outpatients per year (500–700 patients daily). Situated next to the massive Kibera slum, the largest slum in sub-Saharan Africa, the hospital's mission is to "provide quality and affordable healthcare to the poor." During the study period, approximately 3,300 HIV/AIDS patients (3,000 adults and 300 children) were receiving care at the Comprehensive Care Center (CCC) in St. Mary's hospital and among them a total of 350 HIV-positive mothers were receiving PMTCT services. According to the center's data and reports, their PMTCT program maintains a success rate of over 90 %, HIV-free infants born of positive mothers receiving care at St. Mary's hospital. The high success rate made the hospital a suitable site for the study. Ethical

approval was sought and obtained from the Institutional Review Board and St. Mary's Mission hospital's Research Ethics Committee. Data were gathered using structured interviews followed by in-depth interviews.

Eligibility and Recruitment

Women were eligible to participate in the study if they were 18 years or older, able to provide voluntary written informed consent, HIV positive and had given birth to HIV-free infant(s) on or after 1st of October 2011 and were receiving care at St. Mary's Mission Hospital Lang'ata PMTCT Clinic.

A total of 55 women were purposively selected to participate in the study. All informants completed a structured interview and a subset (n = 15) participated in an in-depth interviews. The women (N = 55) were purposively selected using a maximum variation sampling technique based on demographic dimensions including age, marital status, education, religion, employment, number of children and ethnicity. The aim was to select a heterogeneous sample that captures a wide range of perspectives on PMTCT experiences among eligible women [29]. Furthermore, the subset of women (n = 15) was selected using an intensity sampling technique, based on their in-depth information and knowledge on the subject matter, to participate in in-depth interviews [29]. The depth of women's knowledge on the subject was determined based on their responses to the survey's open-ended questions. Women who provided a detailed description of their experiences on the open-ended questions were invited to participate in the in depth interviews.

Data Collection

Each woman (N = 55) enrolled in the study completed an interviewer administered structured interview. Interview schedules had two sections. The first section focused on demographic information as well as PMTCT utilization and adherence characteristics of mothers as measured by HIV status disclosure, partner involvement, use of protection (condoms), location and mode of delivery, infant-feeding methods, clinic attendance, adherence to maternal and infant ARVs dosage and schedule; and participation in community support group(s). The second section contained open ended questions focused on mothers' reasons for success at each stages of the PMTCT continuum of care; HIV testing, status disclosure, initiating ARVs, and rapid weaning at 6 months. The interviewer took notes of participants' responses during the interviews, which lasted between 30 and 45 min. Results from open-ended questions were used to develop themes that were further explored in the in-depth interviews.

In-depth interviews were conducted to gather a deeper understanding of cultural norms within Kenya related to PMTCT and how women overcame these challenges to successfully birth HIV-free infants. Interview discussions lasted for about 45–60 min each. A digital voice recorder was used to record the discussions. Interviews were conducted in Swahili then transcribed verbatim and thereafter translated into English. Upon completion of the interviews, an honorarium equivalent to five U.S. dollars was given to participants in respect of their time and transport cost reimbursement.

Data Analysis

Descriptive statistics were analyzed using IBM SPSS Statistics 20.0 (Armonk, NY: IBM Corp., 2011). Transcripts from open ended structured interviews and in-depth discussions were analyzed qualitatively using content analysis [30]. The analysis process included open coding, creating categories, abstractions, and themes. (See Coding Framework attached).

Results

Demographic, PMTCT Utilization and Adherence Characteristics

A total of 55 mothers were included in the study. The mean age of the sample was 29.7 years. More than three quarters of the women (76.4 %) were married. And about a third (34.5 %) reported to be unemployed. The sample was made up of women from nine ethnic groups with both Christian and Muslim religious backgrounds. See (Table 1) for complete demographic characteristics of the sample. The majority of the mothers (98 %) delivered their babies at a health facility and 91 % exclusively breastfed. Additionally, 91 % of the mothers attended their clinic appointments regularly and 69.1 % strictly adhered to prescribed medication dosage and schedules (never missed a dose). However, it is noteworthy that 18 % of the mothers had not disclosed their HIV status to anyone and among the married ones 37 % were not aware of their partner's HIV status. Additionally, 27 % of the mothers reported that they did not practice safe sex during pregnancy and more than half (53 %) of the women said their partners were not involved in PMTCT. Nearly all (95 %) of women did not participate in any form of a community support group for people with AIDS. Refer to (Table 2) for PMTCT Adherence and Utilization Descriptive Summary of Mothers.

Table 1 Demographic characteristics of participating mothers

Characteristic	(N = 55)	
Mean Age in years (SD)	29.7 (4.6) years	
	Number	Percent
Marital Status		
Single	13	23.6
Married	42	76.4
Education level completed		
Primary	8	14.5
Secondary	21	38.2
College and Above	26	47.3
Employment		
White collar job[a]	14	25.5
Blue collar job[b]	4	7.3
Self-employed	18	32.7
Unemployed	19	34.5
Number of children		
One	22	40.0
Two	24	43.6
Three or more	9	16.4
Religious affiliation		
Christian—Protestant	32	58.2
Christian—Catholic	20	36.4
Muslim	3	5.5
Ethnic identity		
Kamba	10	18.2
Kikuyu	23	41.8
Kisii	4	7.3
Luhya	5	9.1
Luo	8	14.5
Others	5	9.1

[a] Work in an office environment

[b] Manual labor form of work

Emergent Themes

Four key emergent themes were identified: supportive counseling, striving for motherhood, assurance of confidentiality; and confirmation, affirmation and admiration.

Supportive Counseling

Counseling was overwhelmingly acclaimed as the key element of the PMTCT program that played the greatest role in positively influencing women's decisions with regard to HIV testing, status disclosure, initiating ARVs, and rapid weaning at 6 months. Despite the extremely

Table 2 Descriptive summary of PMTCT adherence and utilization among participating mothers

Characteristic	(N = 55)	
First ANC attendance average (SD)	3.8 (1.9) months	
	Number	Percent
HIV status disclosure		
No one	14	17.7
Partner	10	12.7
Mother	35	44.3
Friend	10	12.7
Other	10	12.7
Knowledge of partner's HIV status		
Yes—Positive	19	34.5
Yes—Negative	13	23.6
No	19	34.5
Not applicable[a]	4	7.3
Condom use during pregnancy		
Yes	27	49.1
No	15	27.3
Not applicable[b]	13	23.6
Partner involvement in PMTCT		
Yes	22	40
No	29	52.7
Not applicable[c]	4	7.3
Mode of delivery		
Natural	30	54.5
Caesarean	25	45.5
Full-term versus pre-term delivery		
Full-term	49	89.1
Pre-term	6	10.9
Infant feeding method		
Exclusive formula	4	7.3
Exclusive breastfeeding	50	90.9
Mixed-feeding	1	1.8
Clinic appointments attendance		
Never missed an appointment	50	90.9
Missed I or 2 appointments	4	7.3
Missed more than 3 appointments	1	1.8
Adherence to medication dosage and schedule		
All the time (never missed a dose	38	69.1
Some or most of the times	17	30.9
Community support group membership		
Yes	3	4.5
No	52	94.5

[a] Respondents who reported to not be sexually active during pregnancy

[b] Respondents who reported not to have a partner

[c] Respondents who reported not to have a partner

difficult and distressful experiences of women along the PMTCT cascade (HIV testing positive, status disclosure to spouse, initiating ARVs, and rapid weaning of breast feeding at 6 months), they found supportive counseling to be very useful. For example, a woman describes her struggle with ending her life and the life of her husband once she found she was HIV positive and pregnant. The following is a quote from her:

> Testing positive was very hard. I was suicidal. I wanted to kill my child and the father. But the doctors counseled me and made me realize I was not alone. They told me that HIV was not the end of life. So I chose to live and take medication. I never believed that a child (born of a positive mother) could be negative but the doctors provided me with the right information. My husband is positive as well. I was very angry with him at first because I have never cheated on him and I know for sure he infected me. But through counseling I accepted it and we now live harmoniously. The key to this journey is to accept and take drugs.

Many mothers described HIV disclosure to their spouse or partner to be a dreadful experience. While some feared abandoned by their husbands who they described as the sole breadwinner for the family, others feared violence and being accused of infidelity. One mother explains how supportive counseling helped her disclose her positive HIV status to her violent husband:

> After learning my status I was so heartbroken. In my mind I was sure that my husband would never own up to the fact that he infected me. I was so mad at him but could not confront him because he is violent. But the counselor told me to bring him to my next appointment. Luckily he agreed so we came back together and got tested without telling him I had already tested positive. Of course his results came out positive too. We got counseled and were both put on ARVs.

Rapid weaning at 6 months posed a challenge to mothers especially those that had not disclosed their HIV status to their partners and family. One mother describes how she isolated herself from friends and family and told lies to her husband and how counseling helped her remain steadfast to the feeding guidelines despite the difficulties she was faced with:

> It hasn't been easy. It takes a lot of commitment especially with weaning at 6 months. The baby cried all night long. It took a lot of courage to stop her from breastfeeding. A baby crying all night long and you have breast filled with milk but you can't breastfeed is tormenting. It took so much strength and support from the counselor to get through it. I avoided my friends and extended family because I didn't want them to ask me why I was not breastfeeding. I also lied to my husband that the baby had refused breast milk because he doesn't know I am positive.

Striving for Motherhood

For HIV-positive women who longed for motherhood the PMTCT program was a gift that made it possible for them to bear HIV-negative children. One mother shares her positive experience:

> I really wanted a child and my HIV status was not going to take that away. Through counseling I learned that you could live a positive life and for a long time and have healthy children so long as you follow the doctor's instructions and take your medication. I am a living testimony that PMTCT works. It's so possible; I am here today and my child is negative.

Closely linked to the desire for motherhood was, the maternal instinct to protect a child that was most deemed as innocent by their mothers. This is clear via the voice of a woman who followed her doctor's advice and took medication to assure her baby was HIV negative:

> When I tested positive, life lost meaning. But the thought of the baby I was carrying gave me a reason to live. Because the baby is so innocent I did not want to do anything that would hurt him. I also did not want him to be born with HIV. So I accepted to take medication and follow the doctor's advice.

Assurance of Confidentiality

The majority of the mothers stressed that confidentiality of their HIV status was critical due to the stigma associated with HIV/AIDS. They expressed fears of being rejected or abandoned by their partners, causing hurt or shame to their loved ones and being discriminated against by their friends and communities. As such, mothers went to great extents to keep their HIV status private including traveling for extensive miles to attend a hospital away from their community. Many reported that they found solace in St. Mary's hospital's commitment to protecting patient's privacy. One mother shares her positive experience and privacy in her own words:

> There are other closer places I could go to for these services but I come here because of how kind the service providers are. Everyone here treats you like a human being. You can't even tell you have HIV

> because they treat you just like they treat everybody else. And they speak to you privately. They don't shout about your status in front of other people like some hospitals do.

Another mother shares her reluctance to disclose her HIV status for fear of stigma and why she chooses to receive care at St. Mary's Hospital:

> I have kept it (HIV status) a secret because of fear of stigma. It would kill me if people started treating me differently. I have no way of telling what people will say so to play it safe I keep it to myself. As for my mother, she has high blood pressure. So I don't want to overburden her… I travel from Machakos (a neighboring county) to come here… I come all the way because no one knows me here. I know if I went to a hospital near my village everyone will be talking about me.

Surprisingly, to some mothers long waiting time at St. Mary's hospital's PMTCT clinic was a fair trade-off for confidentiality. One mother expresses this sentiment with a quote below:

> So long as the doctor will take his time and listen to me when my turn comes and will keep our conversations and my health information private, I don't mind waiting.

Confirmation, affirmation and admiration

The successes of PMTCT, either from a personal experience from that of a close friend or even a national figure, played an important role in familiarizing the interventions and validating their potential. To those that had been through the path of PMTCT before, their own experiences were a source of self-confidence. One mother shares how her previous experience with PMTCT made her better prepared and comfortable with the process the second time around:

> This is my second child through PMTCT so I was aware that it works. I also felt more comfortable and sure of myself this time around. The first time I was skeptical but it worked. I just followed the doctor's advice and took the medication. I feel so blessed to have two healthy kids.

And to women that had no prior experience with PMTCT, the success of other mothers gave them hope and strength to forge ahead. One woman shares how knowing a HIV positive mother who had succeeded in delivering a healthy baby made her believe in PMTCT:

> When I first tested positive in 2008, I was given ARVs. I was very weak then with a CD4 count of 200. The drugs made me strong so from then I knew there was hope. Then before I conceived I was provided with information on PMTCT services, which really helped. Plus I knew of an HIV-positive woman whose baby is negative which made me believe that these services really do work.

Furthermore, women drew strength and admiration from Asunta Wagura, a Kenyan AIDS activist living with HIV for over 25 years and delivered two kids through PMTCT. Asunta is a strongly committed advocate for reproductive rights of HIV- positive women and uses her own life as an exemplification that positive women can live a fulfilled life regardless of their HIV status. Ninety percent of the interviews (N = 55) referred to Asunta.

> I was afraid for many years but after listening to Asunta I thought I would try conceiving. That decision has changed my life completely and I owe it to her. I hope one day I could also use my life to inspire and encourage other people like she does.
> If Asunta can stay alive for more than 20 years and have healthy kids so can I. HIV is not the end of life.

Discussion

An assessment of women's PMTCT utilization and adherence characteristics in this study illustrate a reluctance to disclose one's HIV positive status to a spouse/partner, unsafe sex practices during pregnancy, low male partner involvement in PMTCT and very low engagement in any form of community support group(s) by the mothers. Yet despite these impediments, mothers strived to deliver healthy babies. Furthermore, conversations with mothers on their journeys along the PMTCT continuum of care and reasons that persuaded them to adhere to the suggested guidelines generated the following themes: supportive counseling, striving for motherhood, assurance of confidentiality; and confirmation, affirmation and admiration of PMTCT successes. These findings revealed a disconnection between factors that have been associated with failures of PMTCT by previous studies in explaining its success.

Previous studies have found the primary factors that deter patient's choice to utilize and adhere to PMTCT interventions to be: inadequate knowledge of mother-to-child transmission and PMTCT interventions, lack of support and acceptance by family and community as well as poor quality of services [22–27]. Based on these findings a logical presumption is a reversal of these deficiencies to enhance the performance of PMTCT programs. That is, adequate knowledge of mother-to-child transmission and PMTCT interventions, support and acceptance by family and community, and high quality services positive association with

utilization and adherence to PMTCT guidelines. Surprisingly, the findings of this study do not support these assumptions for the PMTCT patients interviewed.

The data reviewed in this study on women's health-seeking behaviors demonstrated interesting trends related to HIV disclosure and gender imbalances. Perhaps the most intuitive is the overwhelming evidence that women's choices on seeking and adhering to services were to a great extent affected by the difficulties of HIV status disclosure and gender imbalances within their relationships with their husbands or partners. For instance, one would expect that such an important occurrence, as HIV infection would be disclosed to the husband or partner; however, such was not the case for the majority of patients interviewed. Some of the women interviewed reviewed that they had not disclosed their status to anybody (including their partners) and some stated that they were not even aware of their partner's status. Furthermore, women described a range of behaviors from mild reluctance to desperate fear of disclosure. More specifically, mothers admitted that they isolated themselves from friends and family to avoid being questioned about the feeding choices for their infants, especially rapid weaning at 6 months. Other women stated that they provided false excuses to their partners, family or friends when confronted with questions on breastfeeding or hospital visits.

Women's reluctance to disclose their HIV status demonstrates the effects of stigma and gender imbalance on PMTCT programming. In fact, the majority of the interviewed women felt that people living with AIDS experience some level of stigma. Stigma refers to attitudes or perceptions of shame, disgrace, blame or dishonor associated with a disease. HIV/AIDS-related stigma comes from a powerful combination of fear and shame. The negative relationship between stigma and disclosure has been well documented in the literature. This study reflects findings in previous studies on women in developing countries that found barriers to disclosure to include fear of accusations of infidelity, abandonment, discrimination and violence [31]. Therefore, it is understandable the women in Kenya with a positive HIV status would be fearful of disclosure to their spouse or partner; yet admirable they were willing to go through the PMTCT process for their babies.

The position of women in society as subservient to their husbands was evident. For instance, despite the fact that most mothers were able to articulate that use of protection was necessary for a pregnant or breastfeeding positive mother, a number of them admitted that they did not practice safe sex either because they had not disclosed their status to their partners or because they could not get their partners to agree on using protection. Additionally, though the majority of the mothers strongly agreed that male partner involvement in the PMTCT programs was important most acknowledged that they could not get their partners to attend clinic with them. As such, it appears that acquisition of knowledge does not necessarily translate to its correct application. More specifically, women were knowledgeable about the importance of safe sex in preventing their unborn babies or breastfeeding infants from contracting HIV, but this did not automatically mean that they could make their partners use condoms. Similarly, women could not force their partners' involvement in PMTCT programs even though they agreed that male partnership was valuable.

Previous research indicate that women's social and economic vulnerability and gender inequality makes it less likely that they will succeed in negotiating protection, and less likely that they will leave a relationship that they perceive to be risky [32]. For example, a study conducted by researchers in Botswana and Zambia in collaboration with researchers from the International Center for Research on Women (ICRW) found that men were more likely to abandon a HIV-positive partner. It also pointed out that women would initially get angry with a HIV-positive partner, but ultimately accept him [32]. These findings align with the current study findings with regard to women's inability to negotiate for safe sex despite their knowledge on the threats of unprotected sex to their health and that of their infants. The fear of abandonment by a male partner and the reciprocal tendency to forgive a HIV-positive male partner was also evident.

Finally, women's decisions on where to seek care contravene conventional wisdom on access to health services. While the majority of them indicated experiencing long travel time and high transportation cost to the hospital, in-depth interviews revealed that some mothers chose to seek care at St. Mary's hospital primarily because it was far-off from their living premises or work places to minimize the chances of encountering someone who might recognize them. Thus, suggesting that women would rather spend more time and money in order to conceal their HIV status than seek treatment near their homes. This observation sits at odds with multiple studies that have described long distance and high transportation cost to the hospital as a health access factor that negatively impacts utilization and adherence to health services due to loss of follow-up [27, 33, 34]. Additionally, in this study the researchers found waiting time not to be a deterrent to receive medical care. In fact, women were willing to wait for long periods of time in order to assure their patient privacy and confidentiality was maintained. Once again, this observation is a deviation from conventional wisdom that contends that long waiting times at clinics are disincentives to patients for following up on their appointments.

In summary, HIV related stigma and gender imbalances create missed opportunities for women to reach out for support, apply acquired knowledge and access more

affordable quality PMTCT services. This study argues that these missed opportunities explain the observed disconnect between factors that have been found to explain PMTCT failures and the current study's findings on facilitators of PMTCT. The study findings suggest that to be successful PMTCT programs ought be adaptive to cultural settings and ensure that mothers are provided with adequate support to optimize their participation and benefit from the services.

Strengths and Limitations

A major contribution of this study is the introduction of a positive dimension in evaluation of PMTCT programs. Use of both structured and in-depth interviews made it possible to gather information from a diverse group of women and later explore emerging themes in more detail with a smaller manageable subset of the group. However, purposive sampling of study informants does limit generalizability of the study findings. Furthermore, bias introduced by the investigator in the collection and analysis of the data remains a constant threat. As Smith and Osborn point out, qualitative analysis is inevitably a personal process and the analysis itself is interpretative work, which the investigator does at each of the stages [35]. As such, the researcher consulted with experts in the field throughout the process of this inquiry to minimize potential bias and increase reliability and content validity. Finally, though a small and manageable sample contributed to the richness of the data, it also limited the study's statistical analyses.

Conclusion

The effectiveness of PMTCT interventions does not rely only on access, health education and a functional healthcare system. Rather, the interplay of these factors and the context in which they exist proves to have an iterative effect on these programs. HIV/AIDS related stigma and gender imbalances create many missed opportunities for HIV-positive mothers to apply acquired knowledge, mobilize support from family and community, and access more affordable care. In an environment riddled with such challenges, supportive counseling, striving for motherhood, assurance of confidentiality; and confirmation, affirmation and admiration of PMTCT successes are vital elements that explain HIV-positive mothers' resolve to utilize and adhere to PMTCT services. To be successful PMTCT programs should be aware of these factors and ensure that mothers are provided with culturally competent care.

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Appendix

See Table 3.

Table 3 Qualitative data coding

Codes	Categories	Themes
Counseling, comfort and encouragement, doctors kind and supportive, assisted disclosure, counseling on positive living, motivational talks on self-acceptance, comfort that I am not alone, HIV testing pre and post counseling, encouragement to start and adhere to ARVs, assurance that HIV is not end of life, counseling on rapid weaning at 6 months, information from doctors on the right delivery methods, doctors friendly and reachable	Counseling at various stages along the PMTCT cascade: -Testing -Partner disclosure -ARVs initiation -Delivery -Breastfeeding	Supportive counseling
Need to protect the child, fear of the child being orphaned, guilt as the child is innocent, desire to be a mother, desire to have a healthy child, a healthy child a symbol of life after HIV, fear for the child's wellbeing, need to stay alive and raise the child, fear of leaving the child with a step-mother, mother's love for the child, mother's instinct to protect the child, child a reason to stay alive	-Maternal protective instinct -Guilt due to a child's innocence. -Desire for motherhood.	Striving for motherhood
Keeping my status private, not shouting my status, private consultation/treatment rooms, keeping my secrets, doctors as confidants, being treated the same as other patients, being treated with respect, nobody knows me here, not disclosing my status to my partner, not being judged	-Keeping patient's HIV status confidential. -Providing private space for counseling and treatment. -Respecting patient's wishes with regard to status disclosure	Assurance of confidentiality

Table 3 continued

Codes	Categories	Themes
If Asunta can make it so can I, I am not alone other women have gone through this and made it, Asunta is my hero, Asuta is my role model, I had given up until I watched Asunta on TV, this is my third child through PMTCT, I didn't believe it at first but then my older child was born negative so I now know it works, my HIV positive friend got a healthy baby so then I believed it works	PMTCT successes at three levels: -Personal experience(s) -Experiences of close friends -Experiences and admiration of HIV activists	Confirmation, affirmation and admiration

Particular → **General**

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