Predictors of Patient Dissatisfaction with Services for Prevention of Mother-To-Child Transmission of HIV in Dar es Salaam, Tanzania

Helga Naburi1,2*, Phares Mujinja3, Charles Kilewo4, Till Bärnighausen5,6, Nicola Orsini2, Karim Manji1, Gunnel Biberfeld2, David Sando6,7, Pascal Geldsetzer6, Guerino Chalamila7†, Anna Mia Ekström2,8

1 Department of Pediatrics and Child Health, Muhimbili University of Health and Allied Sciences (MUHAS), Dar es Salaam, Tanzania, 2 Department of Public Health Sciences, Global Health (IHCAR), Karolinska Institutet, Stockholm, Sweden, 3 School of Public Health and Social Sciences (SPHSS), Muhimbili University of Health and Allied Sciences (MUHAS), Dar es Salaam, Tanzania, 4 Departments of Obstetrics and Gynaecology, Muhimbili University of Health and Allied Sciences (MUHAS), Dar es Salaam, Tanzania, 5 Department of Global Health and Population, Harvard T.H. Chan School of Public Health, Boston, MA, United States of America, 6 Africa Centre for Population Health, Mtubatuba, South Africa, 7 Management and Development for Health (MDH) non-Governmental organization, Dar es Salaam, Tanzania, 8 Department of Infectious Diseases, Karolinska University Hospital, Huddinge, Stockholm, Sweden

† Deceased.

* hnaburi@muhas.ac.tz

Abstract

Background
Mother-to-child transmission (MTCT) of HIV remains a major source of new HIV infections in children. Prevention of mother-to-child transmission of HIV (PMTCT) using lifelong anti-retroviral treatment (ART) for all pregnant and breastfeeding women living with HIV (Option B+) is the major strategy for eliminating paediatric HIV. Ensuring that patients are satisfied with PMTCT services is important for optimizing uptake, adherence and retention in treatment.

Methods
We conducted a facility based quantitative cross-sectional survey in Dar-es-Salaam, Tanzania, between March and April 2014, when the country was transitioning to the implementation of PMTCT Option B+. We interviewed 595 pregnant and breastfeeding women living with HIV, who received PMTCT care in 36 public health facilities. Predictors of overall dissatisfaction with PMTCT services were identified using a multiple logistic regression.

Results
Overall 8% of the patients expressed dissatisfaction with PMTCT services. Patients who perceived health care workers (HCW) communication skills as poor, had a 5-fold (OR 4.9,
95% CI 1.8–13.4) increased risk of dissatisfaction and those who perceived HCW capacity to understand client concerns as poor, had a 6-fold (OR 5.7, 95% CI 2.3–14.0) increased risk. Having a total visit time longer than two hours was associated with a 2-fold increased risk of being dissatisfied (OR 2.3, 95% CI 1.1–4.7). Every 30-minute increment in total visit time was associated with a 10% higher (OR 1.1, 95% CI 1.0–1.2) risk of being dissatisfied. The probability of being dissatisfied ranged from 4% (95% CI 2% - 6%) in the presence of patient-perceived good communication, good understanding of patient concerns, and a total visit time below two hours, to 70% (95% CI 47% - 86%) if HCW failed in all of these aspects.

Conclusion
Patient dissatisfaction with PMTCT services was generally low; reflecting that quality of care was maintained during Tanzania’s transition to Option B+ strategy aiming to increase the number of women initiating life-long ART in PMTCT clinics. Improved HCW communication with clients, their understanding of patient concerns and a reduction of the total visit time would further optimize women's overall satisfaction with PMTCT services in Tanzania.

Introduction
Mother-to-child transmission (MTCT) of human immunodeficiency virus (HIV), accounts for over 90% of new HIV infections among children [1]. Prevention of mother-to-child transmission (PMTCT) of HIV, using antiretroviral therapy (ART) throughout the breastfeeding period is a proven, efficacious intervention, which can lead to near elimination of MTCT (EMTCT) [2].

The ART uptake for PMTCT in sub-Saharan Africa is influenced by multiple factors operating at the individual, community or health facility levels [3, 4]. At the facility, in addition to the shortage of health care workers (HCW), poor patient-provider interaction contributes to dissatisfaction and eventually defaulting from PMTCT services [5, 6].

Patient satisfaction can be defined as the perceived fulfillment of patient needs and desires through the delivery of health care [7–9], or when patients perceive satisfactory quality of care and services that meets their expectations [10–12]. Despite problems with establishing a common definition of “patient satisfaction with care”, the concept continues to be widely used [9]. Many health systems frameworks, such as the WHO’s building blocks and the “control knobs” framework [9], include a measure of patients’ subjective evaluation of health services, such as “patient satisfaction” [13] or “responsiveness” [9] as an intrinsic health systems goal.

Hence, a health systems goal for scaling-up Option B+ efforts should focus not only on increasing the number of patients enrolled on life-long ART, but also on aspects of treatment delivery that influence patient satisfaction with care and long-term retention.

The introduction of ART for pregnant and breastfeeding women (Option B and B+) has contributed to a 3-fold reduction of MTCT rates (from 18% in 2010 to 6% in 2015) in eastern and southern Africa [14].

To achieve the 2020 fast-track targets to end AIDS among children, adolescents and young women, the number of new HIV infections among children needs to be reduced to below 40,000 infected infants by 2018 and fewer than 20,000 by 2020[15]. To achieve this, the implementation of Option B+ must reach all pregnant and breastfeeding women living with HIV
and be sustained over time. However, there are indications that not all women diagnosed with HIV during pregnancy may be ready for lifelong ART and that a majority drops out of the program before the end of the breastfeeding period [16–18]. Studies have shown that, patient satisfaction with services can influence the retention in clinical care and adherence to lifelong ART, i.e. the major prerequisites for improved PMTCT outcomes [5, 19, 20]. For instance, patient satisfaction with HIV care has been linked to viral suppression [21]. Thus, optimizing patient satisfaction with PMTCT services appears crucial for retention in care throughout the PMTCT /EMTCT cascade and subsequently better outcomes [5, 22, 23].

Hence, patient satisfaction may be a feasible strategy to retain women and their families in care to achieve the benefits of PMTCT Option B+.

This study aimed to assess patients' dissatisfaction with PMTCT services and related factors in public health facilities in Dar es Salaam Tanzania.

**Methods**

**Design**

A facility-based cross-sectional survey was conducted in Dar es Salaam, Tanzania between March and April 2014.

**Study setting**

This study was conducted in public health facilities sampled from all public-sector providing PMTCT services in two of the three districts (Ilala and Kinondoni) in Dar es Salaam [24]. The two districts represents the smallest (Ilala) and the largest (Kinondoni) of the three districts of Dar-es-Salaam in terms of the population and number of health facilities [24]. At the time of the study, Tanzania was in the process of phasing out Option A (antenatal and intrapartum ART prophylaxis and nevirapine for HIV-exposed infants) and adopting Option B+ [25, 26]. PMTCT services in Tanzania are provided free of charge and follow the National guidelines that are regularly revised to match the WHO guidelines updates [27].

**Study population and sampling**

All pregnant and breastfeeding women living with HIV, who were receiving PMTCT services in public health facilities within Ilala and Kinondoni districts in Dar-es-Salaam were eligible.

Out of 150 health facilities in these two districts (49 in Ilala and 101 in Kinondoni) providing the integrated antenatal care (ANC) and PMTCT services, we excluded 92 non-public facilities. Ten public facilities were further excluded due to lack of permission from authorities to access them. From the remaining public facilities, we selected all 18 facilities from Ilala and 18 matching (on facility level and size in terms of patient visits) facilities from Kinondoni. Given the length of the questionnaire, one interviewer could efficiently complete at least 3 interviews per day. At the facility, each day the interviewers listed the names of the patients seeking PMTCT services, then used simple random sampling to select 3 patients from this list and invited them to participate in an interview. If there were no patients registered for PMTCT services on the initial visit, the interviewer revisited the facility at least two more times.

**Data collection**

Twenty research assistants with medical backgrounds were recruited and trained to use the research protocol and provided with the tools for data collection. The questions used to collect information on patient satisfaction were previously validated in other studies in Tanzania [5, 28, 29] and reflect the domains of health system responsiveness as defined by the WHO [30].
The questionnaire was translated from English to local language (Kiswahili) and back translated to English. Thereafter, the Kiswahili version of the questionnaire was piloted to ensure reliability, content validity, and quality of the questions before initiating data collection. Permission to conduct interviews in the health facilities was obtained from the district and health facility authorities. Written informed consent was obtained from all women prior to the interviews.

At the selected clinics, pregnant and breastfeeding women living with HIV were interviewed when exiting the clinics after receiving PMTCT services. Relevant information collected included: Patient and health facility characteristics, overall satisfaction with PMTCT services and patient-perceived quality of their interaction with health care workers. The interviewers filled in basic information on health facility characteristics. Respondents were asked to rate their overall satisfaction with PMTCT services on a Likert scale with 5 items ranging from "very good"(1) to "poor"(5). Then they were asked to rate the quality of their interaction with HCW on a Likert scale with 5 items ranging from “very good”(1) to “poor”(5), with regard to their perception on the HCW promptness of attention, clinical skills, communication skills, ability to listen to patients, understood patients concerns and maintaining the confidentiality of patient information. The women were also asked to rate, on a Likert scale with 3 items ranging from "most of the time"(1), “sometimes”(2), “no/never” (3), if they thought the HCW explained things to them clearly and encouraged questions.

To make sure all patients interpreted the questions similarly, the concepts of good communication, confidentiality and prompt attention were first defined in the questionnaire. Good communication was defined as when the provider listens carefully, explains things so that patients can understand, and allow enough time for patients to ask questions. Confidentiality of information was defined as when a patient’s medical information is kept confidential, and that patients can talk with the HCW without other people being able to hear the conversation. Prompt attention was defined as when patients had short waiting times for appointments and could get tests done quickly.

A compensation of 5,000 Tanzanian shillings (equivalent to 3.1 USD according to 2014 exchange rate) was given for respondent's time after completing the survey. The respondents did not get information that they would receive compensation before giving consent. Strict confidentiality was observed, whereby the patient’s name and clinic registration number was not used on the questionnaire. Instead all questionnaires were assigned a special identification number. Completed questionnaires were stored in a locked metal filling cabinet and the electronic database was stored in password-protected file to which only the research team had access.

The Research and Ethics Committee of Muhimbili University of Health and Allied Sciences (MUHAS) Tanzania, approved the study on February 17th 2014.

Statistical analysis

For the purpose of this analysis, responses for our dependent variable (overall satisfaction with PMTCT services) were converted from a 5 items Likert scale to a binary outcome of “dissatisfied” (including “neutral”/ “fair”/ “poor) versus “satisfied” (including “very good” and “good”). The outcome of interest was being “dissatisfied” with PMTCT services.

Similarly the responses for our independent variables were converted from a 5 items Likert scale to a binary outcome, dividing the responses into “poor” (including “neutral”/ “fair”/ “poor), versus “good” (including “very good” and “good”). The independent variables were patient ratings of their perceptions with regard to HCW promptness of attention, clinical skills, communication skills, listening ability, understanding patient concerns and confidentiality.
with patient information. The other independent variables (patients rating of how often the HCW explained things clearly or entertained questions) were in a 3-item Likert scale and were categorized as “YES” (including “most of the time” and “sometimes”) and “NO”.

The associations between patients’ overall dissatisfaction with PMTCT services, and, health facility characteristics, patient socio-demographics, and patient-perceived quality of their interaction with HCW were tested using Fisher’s exact test.

Independent variables that were significantly associated with overall dissatisfaction with PMTCT services were used to create the final multiple logistic regression models using a backward elimination method.

We also examined possible multiplicative interactions between predictors in the final multiple logistic regression model by adding their product terms. A formal p-value for departure from interaction was obtained using a likelihood ratio test comparing the maximized log-likelihoods of the model with and without the product terms.

To examine the variation of the probability of overall dissatisfaction with PMTCT services in relation to possible predictors, we used multiple logistic regression models and reported the odds ratios (ORs) and 95% confidence intervals. “Total visit time” was modeled as a continuous quantitative predictor assuming linearity. We also examined potential departure from linearity using restricted cubic splines with 3 knots at fixed percentile of its distribution [31]. Statistical analyses were performed using Stata software version 14 (Stata Corp 2014 Stata Statistical Software).

**Results**

Six hundred women who were receiving integrated ANC/PMTCT services from 36 different public health facilities in two out of three districts of Dar es Salaam were eligible and 595 (99%) gave consent to be interviewed. Overall, only 48 (8%) of the women reported dissatisfaction with PMTCT services (3% and 5% who rated services as fair and poor, respectively). However, the majority, 360 (61%) rated services as good and 187 (31%) rated PMTCT services as very good (Fig 1).

The mean age of the respondents was 30 (±5.3) years and the average number of children per woman was 2 (±2) children. The majority, 70%, had a primary school education, 20% had secondary school education or more, while 10% had never been to school. Slightly less than two-thirds (63%) of these pregnant and breastfeeding women were in a formal relationship (married or cohabitating) while the rest were divorced, single or widowed. None of these factors were significantly associated with the overall dissatisfaction with the PMTCT services (Table 1).

The household expenditures for the majority of the women interviewed were below or just above the poverty line of approximately 2 USD/person/day. The majority were housewives or lacked a formal job, but 43% were either employed or self-employed. Only 19% of women had been diagnosed with HIV and received PMTCT services for less than one year before the interview. Furthermore, the majority (86%) of women had disclosed their HIV status to at least one family member before the interview. None of these factors was significantly associated (all \( p > 0.05 \)) with patients’ overall dissatisfaction with the PMTCT services (Table 1).

Nurses attended three quarters of all the patients and 70% of women received services in lower level facilities (dispensaries). The majority (91%) of the women reported that facility-opening hours were convenient and 71% said that PMTCT services met their expectations. For 74% of the women, the time between entering and exiting the facility was less than 2 hours. Among all the above-mentioned factors, only a total visit time of more than 2 hours (\( p > 0.001 \)) was significantly associated with patients’ overall dissatisfaction with PMTCT services (Table 2).
Most of the women reported that they had a good perception of the quality of HCW’s communication with the patients (94%), the promptness of attention (94%), the confidentiality level and clinical skills of the HCW (94%). Similarly, 92% and 96% of the patients, respectively, felt that HCW did understand their concerns and listened well to patients. Fewer patients thought that HCW often entertained questions (68%) and 74% found that HCW often explained things clearly. The poor rating on patient-perceived HCW communication skills, promptness of attention, confidentiality with patient information, clinical skills, understanding patient concerns and listening well to patients were significantly associated (all p < 0.05) with overall patient dissatisfaction with PMTCT services. Similarly, patient who thought that HCW did not often entertain questions or give clear explanation, were significantly (p < 0.05) more likely to report overall dissatisfaction with PMTCT services (Table 2).

The average visit time was 1.8 (SD = 1.7) hours, and the difference between the satisfied and the dissatisfied categories was 0.82 hours (95% CI 0.24–1.39, p = 0.005).

In univariable analysis, the unadjusted odds of dissatisfaction were high and significant for patient-perceived poor HCW communication skills, promptness of attention, confidentiality with patient information, clinical skills, understanding patient concerns and not often willing to entertain questions or explain things clearly to patients (Table 3).

A multivariable analysis, including simultaneously all the patient ratings, suggested three strong and significant predictors of being overall dissatisfied with PMTCT services: total visit time exceeding 2 hours, patient-perceived poor HCW communication skills and understanding of patient concerns.

Time exceeding 2 hours was associated with 2-fold higher odds of dissatisfaction (OR 2.3, 95% CI 1.1–4.7). Patient-perceived poor HCW communication skills resulted in 5-fold higher odds of dissatisfaction (OR 4.9, 95% CI 1.8–13.4). Poor understanding of patient concerns was associated with 6-fold increased odds of dissatisfaction (OR 5.7, 95% CI 2.3–14.0) (Table 3). Further adjustment for age, marital status, educational level, and health care worker cadre and facility level did not substantially change the estimates.

---

**Fig 1.** Distribution of the overall patient satisfaction with PMTCT services. Color fill represents levels of dissatisfaction as rated by patients: blue represents “very good”, brown represents “good”, green represents “moderately good” and purple represents “fair” satisfaction.

doi:10.1371/journal.pone.0165121.g001
In our final model, we modeled total visit time as a continuous predictor and found no evidence of departure from linearity (p-value for non-linearity = 0.52). Every 30 minutes' increment in total visit time was associated with 10% higher odds (95% CI 1.01–1.20) of being dissatisfied (Fig 2).

The probability of being dissatisfied with PMTCT services varied considerably according to patient-perceived HCW communication skills, understanding patient concerns, and total visit time. It ranged from 4% (95% CI 2% – 6%) in the presence of patient-perceived good
communication, good understanding of patient concerns, and, a total visit time of less than 2 hours, up to a 70% (95% CI 47% - 86%) probability of being dissatisfied with PMTCT services when all these three factors failed to be fulfilled.

Table 2. Patient ratings of their dissatisfaction with PMTCT services according to health facility characteristics.

|                                      | Total N | Dissatisfied % | p-value |
|--------------------------------------|---------|----------------|---------|
| **Level of health facility attended** |         |                |         |
| Hospital/ health center              | 181     | 6%             | 0.24    |
| Dispensary                           | 414     | 9%             |         |
| **Main care provider**               |         |                |         |
| Doctors                              | 127     | 7%             |         |
| Nurses                               | 449     | 8%             | 0.70    |
| Others (counselors or pharmacists)   | 9       | 11%            |         |
| **Services met client expectations** |         |                |         |
| Yes                                  | 427     | 8%             | 0.15    |
| No                                   | 16      | 19%            |         |
| **Opening hours convenient**         |         |                |         |
| Yes                                  | 543     | 7%             | 0.51    |
| No                                   | 38      | 11%            |         |
| **Total visit time (hours)**         |         |                |         |
| <2                                   | 384     | 5%             |         |
| ≥2                                   | 141     | 13%            | 0.01    |
| **Patient perception of HCW**        |         |                |         |
| **Clinical skills**                  |         |                |         |
| Good                                 | 557     | 6%             |         |
| Poor                                 | 32      | 31%            | <0.001  |
| **Promptness of attention**          |         |                |         |
| Good                                 | 552     | 6%             |         |
| Poor                                 | 37      | 32%            | 0.001   |
| **Confidentiality level**            |         |                |         |
| Good                                 | 550     | 6%             |         |
| Poor                                 | 37      | 27%            | 0.001   |
| **Understanding patient concerns**   |         |                |         |
| Well                                 | 541     | 5%             |         |
| Poor                                 | 47      | 40%            | <0.001  |
| **Often entertaining questions**     |         |                |         |
| Yes                                  | 397     | 5%             |         |
| No                                   | 189     | 13%            | 0.002   |
| **Often explaining things clearly**  |         |                |         |
| Yes                                  | 440     | 6%             | 0.001   |
| No                                   | 148     | 14%            |         |
| **HCW listened to patient**          |         |                |         |
| Well                                 | 568     | 7%             |         |
| Poor                                 | 20      | 35%            | <0.001  |
| **Communication with patient**       |         |                |         |
| Good                                 | 554     | 6%             | <0.001  |
| Poor                                 | 32      | 41%            |         |

Total counts do not always add up to N = 595 because some variables have missing data

doi:10.1371/journal.pone.0165121.t002
We also assessed possible departure from interaction and we found no evidence of interaction between patient-perceived poor communication skills and poor understanding of patient concerns (p = 0.67), patient-perceived poor communication skills and total visit time (p = 0.34) or poor understanding of patient concerns and total visit time (p = 0.50).

Table 3. Odds ratios and 95% confidence intervals of dissatisfaction with the PMTCT services according to the patient’s perception of care received.

| Variables                        | Univariable | ¹Multivariable | ²Multivariable |
|----------------------------------|-------------|----------------|----------------|
| Patient perception of HCW’s      | OR (95% CI) | OR (95% CI)    | OR (95% CI)    |
| Poor understanding of concerns   | 13.4 (6.6–27.2) | 4.3(1.4–13.1)  | 5.7(2.3–14.0)  |
| Poor communication with patients | 11.1 (5.1–24.6) | 3.6 (1.2–10.8) | 4.9 (1.8–13.4) |
| Patient total visit time ≥ 2 hours | 2.5 (1.3–4.9)  | 2.3 (1.1–4.9)  | 2.3 (1.1–4.7)  |
| Poor promptness of attention     | 7.5 (3.5–16.4) | 1.2 (0.3–4.6)  |                |
| Poor confidentiality             | 5.6 (2.51–12.6) | 1.1 (0.3–3.6)  |                |
| Poor clinical skills             | 6.8 (3.0–15.4) | 1.6 (0.5–5.5)  |                |
| Not willing to entertain questions | 2.6 (1.4–4.8)  | 1.0 (0.4–2.6)  |                |
| Not explaining things clearly    | 2.9 (1.5–5.3)  | 1.2 (0.5–3.2)  |                |
| Poor listening to patient concerns | 7.5 (2.8–19.9) | 1.6 (0.4–7.2)  |                |

¹ Multiple logistic regression models including all the potential predictors of dissatisfaction.
² Multiple logistic regression models including the three strongest predictors of dissatisfaction.

doi:10.1371/journal.pone.0165121.t003

Fig 2. Odds ratio of being dissatisfied with the PMTCT services according to time spent at the hospital (hours). Data were fitted using a multiple logistic regression model adjusting for patients perceived poor health care workers’ communication skills and understanding of patients concerns. Solid line is a linear trend, dashed lines are 95% confidence limits of the linear trend, and the long-dash line is the curvilinear trend estimated with restricted cubic splines.

doi:10.1371/journal.pone.0165121.g002
Discussion

Overall, only a small proportion of pregnant and breastfeeding women living with HIV in Dar es Salaam, Tanzania reported dissatisfaction with PMTCT services. However, low rates of patient dissatisfaction overall do not necessarily mean that the quality of PMTCT services is not sometimes compromised [32]. For instance, despite the low level of dissatisfaction, we identified three strong and significant predictors of overall dissatisfaction with PMTCT services: patient-perceived poor HCW understanding of concerns, patient-perceived poor HCW communication skills and a total clinic visit time exceeding two hours being associated with a 5-fold, 4-fold and 2-fold increased risk of being dissatisfied with PMTCT services, respectively. Whereas combined, the individual effects of these factors magnified the probability of being dissatisfied with PMTCT services up to 70%.

Our results also show that these identified predictors influenced women’s dissatisfaction with PMTCT services equally regardless of individual or health facility characteristics. This implies that workforce development to ensure high quality patient-provider interactions where service providers can communicate well with their patients, as well as are able to show a good understanding of their patients’ concerns is very important to keep women living with HIV satisfied with PMTCT services. Strengthening health systems to reduce patients’ visit time will be another crucial strategy for effective scale-up of high-quality PMTCT services.

Despite existing time constraints and staff shortages [33], that compromise HCWs’ ability to provide good care [34], our results indicate that PMTCT providers, succeed to provide services that meet expectations of the majority of the patients to a very large extent. We cannot entirely exclude the possibility that the high ratings may reflect a fear among women to rate the services as poor, especially since most of them rely on the same facilities for their subsequent care. However, we made a thorough attempt to reduce the risk of reporting bias through the use of independent observers and interviewers, and, anonymous questionnaires. Furthermore, our findings are plausible, and consistent with regard to the levels of satisfaction with PMTCT and HIV services reported in other low-income countries [5, 29, 35–37].

Patient satisfaction with PMTCT and ART services, is important as it influences the uptake, retention and adherence [4, 20, 38], hence, patient satisfaction often serves as a determinant of adequate viral suppression [21]. Thus, although only a few patients were dissatisfied with the PMTCT services they received, long-term retention and adherence to lifelong ART (Option B+), will likely require additional efforts [5, 35, 39–41], in particular with regards to ensuring high-quality patient-provider interactions[3, 4]. Our findings also raise concerns that the information women receive with regards to the aim and expected procedure of PMTCT could be less than optimal, because a fairly large proportion of HCW did not often encourage questions from the patients or explained things clearly. This is likely to impact both adherence and retention in ART, the key elements of the overall effectiveness of PMTCT interventions especially Option B+, where patients clearly need to understand the information provided regarding their HIV diagnosis to be able to accept and discuss their status with their partner or other close family members before they are initiated on life-long ART[17]. A study in Ethiopia reported that only one third of women received and understood the messages related to MTCT and PMTCT [35]. Previous research has also found that poor patient-provider interaction in terms of unclear communication, confidentiality concerns, and patients not feeling comfortable to ask questions are reasons for missing PMTCT services [6] and that sub-optimal patient-provider interactions can be significant barriers to accessing ART for pregnant and post-natal women [42].

We previously found that as much as 8 out of 10 new mothers in Dar-es-Salaam who needed ART for their own health (CD4 count <200 cells/mL) were viremic after the
breastfeeding period, raising very serious concerns about the feasibility of life-long adherence to ART in this population [43]. We speculate that part of this very poor adherence to ART post-natally, could be due to unclear communication in early patient-provider interactions. Our speculation are based on the fact that the new mothers reported that they had lost their motivation to continue taking ART after knowing they had protected their children from HIV, because of fearing side effects, or, because they did not feel ready for life-long medication [16]. Good provider-client communication could reduce the risk of defaulting and has previously been found to have a positive effect on patient satisfaction with PMTCT services [6, 35, 44, 45]. Clear communication positively influences the uptake of PMTCT and ART services including adherence to visits and medicines [6, 28]. A previous study involving private HIV clinics in Dar es Salaam found an independent effect of confidentiality and promptness of attention, on patient satisfaction with ART services [29]. This is probably because patients more easily can be noticed and stigmatized in clinics where only people living with HIV attend, compared to integrated ANC/PMTCT clinics where all pregnant and breastfeeding women go, regardless of their HIV status. Additionally, patients attending private facilities may also have higher expectations that such settings should be able to provide timely services, optimal privacy and confidentiality given the lower work load in private compared to public facilities [4]. However, confidentiality and privacy is important for patients’ satisfaction with ART and PMTCT services, both involving counseling and testing for HIV, and many patients are worried about accidental disclosure of their HIV status [5, 6, 35].

Findings from our study also indicate that overall dissatisfaction with PMTCT services increased with a low rating of perceived clinical skills among the HCW. Although this effect was not statistically significant, it can affect the uptake of antiretroviral prophylaxis among pregnant and breastfeeding women living with HIV who attend ANC clinics [4].

Finally, long waiting/visit time has also previously been shown to reduce patient satisfaction in PMTCT services and subsequent utilization of ANC/PMTCT services [4, 5, 42, 46–48]. Long visit time at the clinic is usually a result of high patient load in relation to the scarce human resources available to meet this demand, in turn influencing the quality of care [46]. Here, our results have several interesting implications since neither the level of health facility, nor cadre, influenced patient dissatisfaction with PMTCT. This opens up for task-shifting as an opportunity to reduce staff workload and subsequently ensure quality patient-provider interactions.

This study had some limitations. Firstly the cross-sectional study design does not allow for a causal effect analysis, but it is nonetheless useful for identifying predictors of patient dissatisfaction with PMTCT services in Tanzania. Secondly, despite the precautions taken in terms of external interviewers and anonymity, some respondents may not have been entirely open regarding the perceived quality of their interaction with HCW, and that could result in information bias. Thirdly, it is difficult for patients to accurately measure actual clinical skills or communication skills of the HCW. However this study aimed to gather the patients’ own views and perceptions of services as subjective indicators of quality of care. Finally, our findings may also have limited generalizability to private facilities and other PMTCT facilities in Tanzania since we only used public facilities in Dar es Salaam.

Despite these limitations, we believe this study gives a good picture of the level of dissatisfaction with PMTCT services as well as possible predictors in this East-African setting. It is consistent with other studies in low-income countries and reflects that the struggle of HCWs to offer services and meet expectation of patients in PMTCT facilities is successful in spite of a high workload and often poor remuneration.
Conclusion

Patient dissatisfaction with PMTCT services was generally low. However, improving the quality of communication with patients, understanding patients’ concerns and reducing the total visit time is probably a strategic move to improve client satisfaction with PMTCT care and in turn optimizing the likelihood of retention in PMTCT Option B+ programs. This is crucial in our strive towards EMTCT, and to achieve the fast-track targets to end AIDS among children, adolescents and young women.

Acknowledgments

We are grateful to the study participants, the Management and Development for Health (MDH) team, the health facility authorities and research assistants who made this study possible. We thank the Swedish International Development Cooperation Agency (Sida) and the MDH organization, Dar es Salaam, for funding.

Author Contributions

Conceptualization: HN AME PM CK DS GC PG TB.
Formal analysis: HN NO.
Funding acquisition: AME GB PM CK TB GC KM HN.
Investigation: HN DS CK.
Methodology: HN AME PM CK DS GC PG TB.
Project administration: HN CK DS AME GC.
Resources: DS GC.
Supervision: AME GB NO PM CK TB KM GC.
Visualization: AME GB NO PM CK TB KM GC.
Writing – original draft: HN.
Writing – review & editing: AME GB NO PM CK TB KM HN PG DS.

References

1. De Cock KM, Fowler MG, Mercier E, de Vincenzi I, Saba J, Hoff E, et al. Prevention of mother-to-child HIV transmission in resource-poor countries: translating research into policy and practice. JAMA. 2000; 283(9):1175–82. Epub 2000/03/07. PMID: 10703780.
2. Siegfried N, van der Merwe L, Brocklehurst P, Sint TT. Antiretrovirals for reducing the risk of mother-to-child transmission of HIV infection. The Cochrane database of systematic reviews. 2011;(7): Cd003510. Epub 2011/07/08. doi: 10.1002/14651858.CD003510.pub3 PMID: 21735394.
3. Gourlay A, Birdthistle I, Mburu G, Iorpena K, Wringe A. Barriers and facilitating factors to the uptake of antiretroviral drugs for prevention of mother-to-child transmission of HIV in sub-Saharan Africa: a systematic review. J Int AIDS Soc. 2013; 16:18588. Epub 2013/07/23. doi: 10.7448/ias.16.1.18588 PMID: 23870277; PubMed Central PMCID: PMCPMC3717402.
4. Deressa W, Seme A, Asefa A, Teshome G, Enqusellassie F. Utilization of PMTCT services and associated factors among pregnant women attending antenatal clinics in Addis Ababa, Ethiopia. BMC pregnancy and childbirth. 2014; 14:328. Epub 2014/09/23. doi: 10.1186/1471-2393-14-328 PMID: 25234199; PubMed Central PMCID: PMCPMC4175621.
5. Lyatuu M, Msamanga G, Kalinga A. Clients’ satisfaction with services for prevention of mother-to-child transmission of HIV in Dodoma Rural district. East Afr J Public Health. 2008; 5(3):174–9. PMID: 19374320
6. Gourlay A, Wringe A, Birdthistle I, Mshana G, Michael D, Urassa M. "It is like that, we didn't understand each other": exploring the influence of patient-provider interactions on prevention of mother-to-child transmission of HIV service use in rural Tanzania. PLoS One. 2014; 9(9):e106325. Epub 2014/09/03. doi: 10.1371/journal.pone.0106325 PMID: 25180575; PubMed Central PMCID: PMCPMC4152246.

7. Kravitz R. Patient satisfaction with health care. Journal of general internal medicine. 1998; 13(4):280–2. doi: 10.1046/j.1525-1497.1998.00084.x PMID: 9565395

8. Asadi-Lari M, Tamburini M, Gray D. Patients' needs, satisfaction, and health related quality of life: towards a comprehensive model. Health and quality of life outcomes. 2004; 2(1):1.

9. World Health Organization. The world health report-Health systems: improving performance (Electronic edition). Geneva: World Health Organization; 2001 (consulted on 26-1-2012).

10. Lochman JE. Factors related to patients’ satisfaction with their medical care. Journal of community health. 1983; 9(2):91–109. PMID: 6678264

11. Pascoe GC. Patient satisfaction in primary health care: a literature review and analysis. Evaluation and program planning. 1983; 6(3–4):185–210. PMID: 10299618

12. Pulia M, FAAEM M. Simple Tips to Improve Patient Satisfaction. American Academy of Emergency Medicine. 2011; 18(1):18–9.

13. Roberts M, Hsiao W, Berman P, Reich M. Getting health reform right: a guide to improving performance and equity. Bulletin of the World Health Organization. 2006;84(2).

14. Joint United Nations Programme on HIV/AIDS (UNAIDS). Prevention gap report Geneva, Switzerland: UNAIDS; 2016 [cited 2016 August 30]. Available from: http://www.unaids.org/sites/default/files/media_asset/2016-prevention-gap-report_en.pdf.

15. UNAIDS President’s Emergency Plan for AIDS Relief (PEPFA R) and Partners (2016). Start Free, Stay Free, AIDS Free: A super fast track framework for ending AIDS among children, adolescents and young women by 2020'.

16. Ngarina M, Tarimo EA, Naburi H, Kilewo C, Mwanyika-Sando M, Chalamilla G, et al. Women’s preferences regarding infant or maternal antiretroviral prophylaxis for prevention of mother-to-child transmission of HIV during breastfeeding and their views on Option B+ in Dar es Salaam, Tanzania. PLoS One. 2014; 9(1):e85310. Epub 2014/01/28. doi: 10.1371/journal.pone.0085310 PMID: 24465532; PubMed Central PMCID: PMCPMC3899007.

17. Kim MH, Zhou A, Mazenga A, Ahmed S, Markham C, Zomba G, et al. Why Did I Stop? Barriers and Facilitators to Uptake and Adherence to ART in Option B+ HIV Care in Lilongwe, Malawi. PLoS One. 2016; 11(2). doi: 10.1371/journal.pone.0149527 PMID: 26901563; PubMed Central PMCID: PMCPMC4762691.

18. Tenthani L, Haas AD, Tweya H, Jahn A, van Oosterhout JJ, Chimbwandira F, et al. Retention in care under universal antiretroviral therapy for HIV-infected pregnant and breastfeeding women (‘Option B+’ in Malawi. AIDS (London, England). 2014; 28(4):589–98. Epub 2014/01/29. doi: 10.1097/qad.0000000000000143 PMID: 24468999; PubMed Central PMCID: PMCPMC4009440.

19. Schaufler HH, Rodriguez T, Milstein A. Health education and patient satisfaction. Journal of Family Practice. 1996; 42(1):62–9. PMID: 8537807

20. Sprague C, Chersich MF, Black V. Health system weaknesses constrain access to PMTCT and maternal HIV services in South Africa: a qualitative enquiry. AIDS research and therapy. 2011; 8(1):1.

21. Dang BN, Westbrook RA, Black WC, Rodriguez-Barradas MC, Giordano TP. Examining the link between patient satisfaction and adherence to HIV care: a structural equation model. PLoS One. 2013; 8(1):e54729. Epub 2013/02/06. doi: 10.1371/journal.pone.0054729 PMID: 23382948; PubMed Central PMCID: PMCPMC3559888.

22. Ciaranello AL, Perez F, Keatinge J, Park JE, Engelsmann B, Maruva M, et al. What will it take to eliminate pediatric HIV? Reaching WHO target rates of mother-to-child HIV transmission in Zimbabwe: a model-based analysis. PLoS medicine. 2012; 9(1):e1001156. Epub 2012/01/19. doi: 10.1371/journal.pmed.1001156 PMID: 22253579; PubMed Central PMCID: PMCPMC3254654.

23. Barker PM, Mphantswe W, Rollins N. Antiretroviral drugs in the cupboard are not enough: the impact of health systems’ performance on mother-to-child transmission of HIV. Journal of acquired immune deficieny syndromes (1999). 2011; 56(2):e45–8. Epub 2010/11/19. doi: 10.1097/QAI.0b013e3181fd8f20 PMID: 21084998.

24. Tanzania National Bureau of Statistics and ICF Macro. 2010 Tanzania Demographic and Health Survey, Key Findings. Calverton, Maryland, USA: NBS and ICF Macro, 2011.

25. World Health Organisation. Programmatic update, use of antiretroviral drugs for treating pregnant women and preventing HIV infection in infants. Geneva: WHO, 2012.

26. World Health Organisation. Consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection. Geneva: WHO, 2013.
27. United Republic of Tanzania Ministry of Health and Social Welfare. The National Guidelines for Comprehensive Care Services for Prevention of Mother-to-Child Transmission of HIV and Keeping Mothers Alive. 2013.

28. Poles G, Li M, Siril H, Mhalu A, Hawkins C, Kaaya S, et al. Factors associated with different patterns of nonadherence to HIV care in Dar es Salaam, Tanzania. Journal of the International Association of Providers of AIDS Care. 2014; 13(1):78–84. Epub 2012/12/28. doi: 10.1177/1545109712467068 PMID: 23269515; PubMed Central: PMC3809339.

29. Miller JS, Mhalu A, Chalamilla G, Siril H, Kaaya S, Tito J, et al. Patient satisfaction with HIV/AIDS care at private clinics in Dar es Salaam, Tanzania. AIDS care. 2014; 26(9):1150–4. Epub 2014/02/07. doi: 10.1080/09540121.2014.882487 PMID: 24499337; PubMed Central: PMC4465080.

30. Gostin L, Hodge J, Valentine N, Nygren-Krug H. The domains of health responsiveness. A Human Rights Analysis. 2003.

31. Orsini N, Greenland S. A procedure to tabulate and plot results after flexible modeling of a quantitative covariate. Stata Journal. 2011; 11(1):1.

32. Kumwenda A. Evaluation of the quality of counselling for prevention of mother to child transmission of HIV offered to pregnant women in the copperbelt province of Zambia. 2011.

33. World Health Organization. World health statistics 2016: Monitoring health for the SDGs, sustainable development goals. Geneva: WHO, 2016.

34. Nguyen TA, Oosterhoff P, Pham YN, Hardon A, Wright P. Health workers' views on quality of prevention of mother-to-child transmission and postnatal care for HIV-infected women and their children. Human resources for health. 2009; 7:39. Epub 2009/05/15. doi: 10.1186/1478-4491-7-39 PMID: 19430094; PubMed Central: PMC2684067.

35. Asafa A, Mitihe G. Prevention of mother-to-child transmission (PMTCT) of HIV services in Adama town, Ethiopia: clients' satisfaction and challenges experienced by service providers. BMC pregnancy and childbirth. 2014; 14:57. Epub 2014/02/04. doi: 10.1186/1471-2393-14-57 PMID: 24484774; PubMed Central: PMC3912258.

36. Dansereau E, Masiye F, Rakidou E, Masters SH, Burstein R, Kumar S. Patient satisfaction and perceived quality of care: evidence from a cross-sectional national exit survey of HIV and non-HIV service users in Zambia. BMJ open. 2015; 5(12):e009700. doi: 10.1136/bmjopen-2015-009700 PMID: 26719321.

37. Tran BX, Nguyen NPT. Patient satisfaction with HIV/AIDS care and treatment in the decentralization of services delivery in Vietnam. PLoS one. 2012; 7(10):e46680. doi: 10.1371/journal.pone.0046680 PMID: 23071611.

38. Rosen S, Fox MP. Retention in HIV care between testing and treatment in sub-Saharan Africa: a systematic review. PLoS medicine. 2011; 8(7):e1001056. Epub 2011/08/04. doi: 10.1371/journal.pmed.1001056 PMID: 21811403; PubMed Central: PMC3139665.

39. Oche M, Raji M, Kajoie A, Gana G, Anjo J, Okafogou N, et al. Clients' satisfaction with antiretroviral therapy services in a tertiary hospital in Sokoto, Nigeria. Journal of AIDS and HIV Research (Online). 2013; 5:328–32.

40. Nwabueze SA, Adogu PO, Ilika AL, Asuzu MC, Adinma ED. Perception of quality of care in HIV/AIDS programmes among patients in a tertiary health care facility in Anambra State. Nigerian journal of medicine: journal of the National Association of Resident Doctors of Nigeria. 2011; 20(1):144–50. Epub 2011/10/06. PMID: 21970277.

41. Haas AD, Msukwa MT, Egger M, Tenthani L, Tweya H, Jahn A, et al. Adherence to Antiretroviral Therapy During and After Pregnancy: Cohort Study on Women Receiving Care in Malawi's “Option B+” programme. Clinical Infectious Diseases. 2016:ciw500.

42. Duff P, Kipp W, Wild TC, Rubaale T, Okech-Ojony J. Barriers to accessing highly active antiretroviral therapy by HIV-positive women attending an antenatal clinic in a hospital cervical in western Uganda. J Int AIDS Soc. 2010; 13:37. Epub 2010/09/25. doi: 10.1186/1758-2652-13-37 PMID: 20863399; PubMed Central: PMC2954932.

43. Ngarina M, Poponeo R, Klibwe C, Biberfeld G, Ekstrom AM. Reasons for poor adherence to antiretroviral therapy postnatally in HIV-1 infected women treated for their own health: experiences from the Mitra Plus study in Tanzania. BMC public health. 2013; 13:450. Epub 2013/05/08. doi: 10.1186/1471-2458-13-450 PMID: 23647555; PubMed Central: PMC3651864.

44. Bargat K, Pal D, Lodha R, Bankwar V. Clients' satisfaction with antiretroviral therapy services with Harminda Hospital Bhopal. Nat J Community Med (India). 2011; 2(2):241–3.

45. Ekouevi DK, Stringer E, Coetzee D, Tih P, Creek T, Stinson K, et al. Health facility characteristics and their relationship to coverage of PMTCT of HIV services across four African countries: the PEARL study. PLoS One. 2012; 7(1):e29823. Epub 2012/01/26. doi: 10.1371/journal.pone.0029823 PMID: 22276130; PubMed Central: PMC3262794.
46. Ashipa T, Ighedosa S. Assessment of clients’ satisfaction with the PMTCT counselling service in Benin city, Edo state, Nigeria. Journal of Medicine and Biomedical Research. 2014; 12(2):150–65.

47. Chinkonde JR, Sundby J, Martinson F. The prevention of mother-to-child HIV transmission programme in Lilongwe, Malawi: why do so many women drop out. Reproductive health matters. 2009; 17 (33):143–51. Epub 2009/06/16. doi: 10.1016/s0968-8080(09)33440-0 PMID: 19523591.

48. Muchedzi A, Chandisarewa W, Keatinge J, Stranix-Chibanda L, Woelk G, Mbizvo E, et al. Factors associated with access to HIV care and treatment in a prevention of mother to child transmission programme in urban Zimbabwe. Journal of the International AIDS Society. 2010; 13(1):1.