BMJ Open

Facilitators and barriers to optimum uptake of multimonth dispensing of antiretroviral treatment in Morogoro, Tanzania: a qualitative study

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To cite: Machumu N, Frumence G, Anaeli A. Facilitators and barriers to optimum uptake of multimonth dispensing of antiretroviral treatment in Morogoro, Tanzania: a qualitative study. *BMJ Open* 2024;**14**:e080434. doi:10.1136/bmjopen-2023-080434

► Prepublication history and additional supplemental material for this paper are available online. To view these files, please visit the journal online (https://doi.org/10.1136/bmjopen-2023-080434).

Received 30 September 2023
Accepted 11 June 2024

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ABSTRACT

Objectives Aimed at determining facilitators and barriers to optimum uptake of multimonth dispensing (MMD) of antiretroviral treatment (ART).

Design Qualitative study conducted through in-depth interviews.

Setting An explorative qualitative approach conducted at three high-volume care and treatment clinics in Morogoro Municipality, Tanzania.

Participants Data were collected from a purposefully selected sample of 22 participants. Of them, 9 were healthcare providers and 12 were clients on ART receiving MMD. Audio records from the interviews were transcribed, translated, and thematically analysed.

Results Evidence showed that multimonth dispensing can be improved through strengthened health system barriers such as having proper guidelines and involving stakeholders. Other facilitators included service providers' ability to identify eligible clients, fast-tracking of services, quality improvement implementation, peer-to-peer inspiration and clients' satisfaction and awareness. Identified barriers to effective multimonth dispensing included inadequate drug supply, prolonged turn-around time of HIV viral load results, delayed integrated Tuberculosis (TB) preventive therapy initiation, stigma and retention challenges.

Conclusion Multimonth dispensing has the potential to address the health system challenges in Tanzania if guidelines are well informed to stakeholders, and facets of quality of care are improved. Addressing the earmarked barriers such as ensuring medicine, supplies and diagnostics, while addressing retention challenges and stigma.

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ By involving the research team in peer-debriefing sessions we strove to ensure confirmability and consistency.
⇒ Dependability was ensured through an in-depth methodological description of the study to enable future researchers to repeat the work.
⇒ Participants were a mix of providers and patients with different professional levels and lengths of treatment, hence providing an in-depth understanding of the barriers and facilitators to the uptake of multimonth dispensing (MMD).
⇒ Clients who were once on MMD but have currently switched to monthly dispensing were not included in the study, however, they could provide valuable insights into the barriers and facilitators to MMD uptake.
⇒ The sample size of the study was relatively small, hence further studies should address this to better characterise specific patient groups or distinctive enablers or barriers.

INTRODUCTION

Efforts to address the burden of HIV called on countries to adopt fast-track targets to ensure that 95% of people living with HIV (PLHIV)/AIDS know their status, 95% of them are on antiretroviral treatment (ART) and 95% attain viral suppression by 2030.[1] For this, the WHO recommended a test and treat policy to reach the ambitious target of including more people in HIV programmes.[2] The policy required anyone testing positive for HIV to immediately start treatment regardless of the CD4 count or disease stage. The adoption of this policy in Tanzania contributed to the increasing number of HIV clients on ART, which overwhelmed the care and treatment clinics (CTCs) and subsequently affected the quality of services.[3 4] Adoption of this policy expanded ART coverage significantly in 2020 where 82% of PLHIV in the country were receiving ART, with a 30% increase from 52% in 2015.[5 6]

In addressing the increase of clients on ART and therefore relieving the CTC congestion, the WHO recommended a differentiated service delivery model to cater to the increasing burden in the health systems efficiently and effectively.[7] A multimonth dispensing (MMD) model for ART required stable ART patients to receive 3–6 months of ART regimens at one time and would not need to return to clinics monthly for their

ARV (Anti-retroviral) refill.[8] Stable patients are defined as PLHIV on ART for more than 6 months with more than 5 years of age, viral load copies less than 50/mm^3, evidence of ART adherence, no opportunistic infections, adherent to appointment dates and not pregnant nor breast feeding.[3] Apart from the elimination of the need for monthly clinic visits, the MMD approach has reduced waiting time and travel costs, significantly associated with retention in care and improved treatment adherence compared with a monthly drug regimen given.[9] The provider's positive attitude and accuracy of patient differentiation also facilitated the uptake of MMS.[10 11]

At least 80% of PLHIV on ART are eligible to be managed under MMD. However, in Tanzania, it has been difficult to attain this goal since the adoption of test and treat policy in 2017.[4] Lack of knowledge among healthcare workers on eligibility criteria, insufficient ARV supply and unnoticeable patient transition from eligible to ineligible were among the reported barriers to MMD implementation.[10 12] There is still limited evidence on barriers and facilitators to optimum uptake of MMD of ART. This study, therefore, explored facilitators and barriers to the optimum uptake of MMD in Morogoro Municipality.

MATERIAL AND METHODS

Study design

A cross-sectional study using a qualitative approach through in-depth interviews was employed to understand facilitators and barriers to the uptake of MMD from the perspective of healthcare providers and PLHIV on ART. A qualitative study design was considered appropriate because understanding barriers and facilitators of uptake of MMD requires an in-depth exploration of views from different key informants.

Study setting and population

The study was conducted in Morogoro municipal, one of the nine districts and the most urbanised area of Morogoro Region. HIV was prevalent among 4.2% of the population of Morogoro in 2016, up from 3.8% in 2012. Although the burden is still lower than the national average (5.1%), the upward trend is worrisome.[13 14] The municipality is a business centre connecting the central corridor and southern highlands and has increasing commercial and human activities, coupled with long truck transportation hub, seasonal agricultural exchange, among other economic activities.

These attract an influx of people from other districts and regions for business purposes posing a high risk for HIV. Moreover, the number of PLHIV attending CTCs is the highest in Morogoro municipal, hence the further choice of the study area. Data were collected from 6 to 27 June 2021. Study participants included healthcare providers working at CTCs from the selected facilities and PLHIV registered in CTCs and receiving antiretroviral therapy (ART) for at least 6 months from the selected health facilities.

Data sources and collection

Two pretested semistructured interview guides containing questions specific to the recruited study participants (healthcare providers and PLHIV on ART) were used. The tools focused on facilitators and barriers to the uptake of MMD. The guiding questions were initially written in English and then translated into Kiswahili that is the medium of communication used during the study. One research assistant who was fluent in both languages was recruited based on experience in qualitative research. The research assistant was oriented on the study objectives, overview of data collection processes, obtaining consent from the participants, interview skills, interview guides and use of a voice recorder. The tools were pretested in Morogoro DC at Mkuyuni Health Centre before use to ensure consistency, validity and reliability of the data collected. Moreover, pretesting helped to ensure that the study instruments achieved the study objectives determined the duration of the interview and planned it accordingly.

The first author conducted in-depth interviews with the help of the research assistant. In-depth interviews were conducted in one of the CTC's offices where privacy and confidentiality were maintained during the entire period of data collection. A tape recorder and side notes were used and the interviews lasted 20–35 min on average. After every interview, a comparative evaluation was conducted to ensure adherence to the protocol as well as to identify new emerging issues. This was followed by daily debriefings with the second authors to discuss the emerging themes and challenges encountered during data collection as well as how to address them.

Sampling techniques and sample size

For contextual variation of data, three high-volume sites in the Municipality were purposively selected. These included Morogoro Regional and Referral Hospital, hospital, Sabasaba Health Centre and Mazimbu Hospital. Purposive sampling was used to identify and approach participants from the selected facilities based on their roles in MMD implementation. The healthcare providers were purposively selected from a variety of cadres including clinicians, ART nurses, pharmacists and Community-Based HIV Services (CBHS) focal persons. Participants from CTC were chosen because they were likely to give broader insights into the uptake of MMD. CTC in-charges and CBHS focal persons assisted in the selection of relevant PLHIV to provide their experiences on facilitators and barriers to the uptake of MMD. Moreover, this selection process was used to ensure that the selected participants had rich information regarding the research questions. Readiness and openness about their HIV status were also considered important to enrich the discussion on different issues including HIV, ART uptake and MMD. The study aimed at interviewing 30 participants, however after the 19th interview, there was an occurrence of idea repetition. Following the rule of saturation, the data collection ended at the 22nd interview.[15]

Moreover, no researcher characteristics influence the research.

Data analysis

Interviews were transcribed verbatim. Audio recordings and notes were reviewed against the transcripts and corrections were made across gaps. Thematic analysis was employed using an iterative approach in five steps.[16] The first step involved data familiarisation through multiple readings of interview transcripts. The second step entailed generating a coding framework. Codes were inductively generated from the interview transcripts. The third stage was abstracting the coded data into thematic categories. The fourth step was the refining of the emergent themes. The fifth step of naming the themes and subthemes. The final step was write-up where a compilation and overall synthesis were done.

To judge the trustworthiness of the results, we used the criteria of credibility, transferability, dependability and confirmability. Triangulation in data collection by including key informant interviews, and document reviews was employed to increase credibility. The purposive sampling of key informants to reach maximum variation was aimed at increasing transferability. By involving the research team in peer-debriefing sessions to reflect and discuss procedures and interpretation of the results, we strove to ensure confirmability and consistency. Analysis was done both manually and with INVIVO V.10 software. Participants were informed to be part of the dissemination of the study results, however they were not part of the study design

Patient and public involvement

At all health facilities, CTC healthcare providers were purposefully involved in the recruitment of clients involved in the study. Participants were informed to be part of results dissemination after analysis, and this was done by providing each facility with findings reports electronically and via phone calls for clarifications. However, there was no initial involvement in the study design.

RESULTS

Sociodemographics

A total of 22 key informants were interviewed (online supplemental table 1). Of them, nine were healthcare providers of whom, four (44%) were aged between 25 and 34 years and five (67%) were women. On the other hand, five (38%) of the 13 PLHIV interviewed were aged between 35 and 44 years, and 11 (85%) were women. Among the PLHIV clients interviewed, six (46%) had been on ART between 6 and 10 years, with a mean duration of 9 years. On the other hand, four (44%) of the healthcare providers worked at CTC for 2–3 years. Four (45%) healthcare providers were clinicians and 12 (92%) of PLHIV had a primary education level (online supplemental table 1).

Facilitators to the optimum uptake of multimonth dispensing of art

Three subthemes emerged as facilitators to the uptake of MMD, which included the health system, health facility and individual factors (online supplemental table 2).

Health system facilitators

These included policy and guidelines and stakeholder's support.

Policy and guidelines

Respondents reported that the presence of policy and guidelines encouraged healthcare providers to enrol more eligible clients in MMD because of the increasing number of clients in care. This was reported to in turn reduce clients' overcrowding during the clinic visits.

> …we currently have more than 3000 clients on ART not as before…as a result of policy and guidelines we are obliged to enroll clients on MMD to reduce client's overcrowding and queue resulting from same-day ART initiation… (Provider 2, Health facility 1)

Stakeholders' support on MMD implementation

The contribution of stakeholders on supervision and training (Non-Governmental Organizations, (NGOs); President's Office Regional Administration and Local Government (PORALG); and Ministry of Health, Community Development, Gender, Elderly and Children (MOHDGEC)) was among the reported facilitators in MMD implementation. Respondents reported that the stakeholders' contribution to healthcare providers through formal and informal training has increased adherence to eligibility criteria, which in turn improves MMD uptake.

> … support from our regional stakeholders through training and supervision has enabled us in the implementation…their constant reminder has helped us on the uptake and implementation (Provider 2, Facility 1).

Health facility facilitators

Health facility factors reported included providers' ability to identify eligible clients for MMD, quality improvement uptake, ongoing healthcare providers' moral support to PLHIV, fast track services of MMD clients and timely collection of HIV viral load facilitates MMD uptake.

Provider's ability to identify eligible clients for MMD

The service provider's ability to classify stable clients was among the facilitators mentioned to improve the uptake of MMD. It was reported that every client was assessed during their visit to figure out if they are eligible or not and all truly eligible clients were put on MMD timely and accordingly based on the eligibility criteria.

> … Also, our ability to identify the stability of clients based on eligibility criteria has enabled us in

this otherwise you will not be able to implement… (Provider 1, Facility 1)

Providers were also able to mention the eligibility criteria for MMD, which included clients on ART for >6 months, viral load suppression/copies less than 50, CD4 count >350 copies/mm^3, clinic and drug adherence, <5 years, not pregnant, not on IPT, no opportunistic infections. It was also reported that no client is put on MMD without being assessed.

… there are many factors but mostly the eligibility criteria… firstly must be on ART for more than 6 months; viral load of less than 50 copies; no opportunistic infections, not on IPT; if it's a child, should be>5 years. All these differentiate clients to be stable for multi-month dispensing (Provider 2, Facility 2)

Quality improvement implementation

It was reported that the implementation of quality improvement plans through the revision of targeted performance indicators has influenced the increased uptake of MMD services at the facility. Gaps hindering uptake were identified early and strategies were put forward for improving the uptake of MMD during facility and department meetings.

…we conduct quality improvement meetings where we discuss several indicators including MMD uptake where at least 80% of all clients currently receiving care and treatment should be on MMD… [Provider 1, Facility 2]

Fast track services of MMD clients

Fast track service to clients receiving MMD has been reported among the health facility facilitators on improving MMD uptake because of the reduced clients' waiting time during clinic visits. Clients were able to directly receive drugs without consulting the clinician, unlike 1 monthly dispensing where they spent more time at the clinics waiting for clinician services. This aided them to timely getting drugs and continuing with other socio-economic activities.

…I receive the service in quicker, so I don't waste time at all. Like today I received my service very fast unlike the days I was on monthly prescriptions where I would spend 6–7 hours waiting…So, they decided to bring this service to save our waiting time to continue with other income-generating activities (Client 3, Facility 1)

Moreover, most respondents reported healthcare providers' moral support to clients as a facilitator to MMD uptake. It was portrayed that a good providers–client relationship motivated clients on medication adherence to continue being on MMD. At every clinician visit clients were screened for any barrier that may hinder drug adherence and given health education on drug adherence to ensure they remain adherent to medications. Moreover, acknowledging their good adherence also encouraged clients to become adherent.

Congratulating clients for meeting the criteria for many-months prescription is very encouraging to us (clients) to stay adherent medications… motivation keep us on track. I have been encouraged and helped to keep well after joining this service. So, congratulating someone helps to keep them on this service… (Client 3, Facility 1).

Timely collection of HIV viral load

Timely collection of HIV viral load samples from clients was reported to facilitate MMD uptake. Timely sample collection facilitated timely return of results, which in turn assists the early categorisation of stable clients to be put on MMD based on the existing eligibility criteria. Providers used sticker reminders to avoid missed opportunities for clients during clinic appointments.

The factors that enable uptake of MMD are the ability to ensure that our clients test for viral load on time… we have a sticker reminder system not to miss the clients eligible for sample collection and files are prepared a day before the clinic ([Provider 2, Facility 1).

Individual facilitators

Individual factors included the client's satisfaction/pleasure from MMD service, peer clients' motivation, increasing client's demand and clients' awareness of MMD and its eligibility criteria.

Client's satisfaction/pleasure from MMD service

Respondents reported that client satisfaction through reduced travel costs and having more time to continue with other activities encouraged them to take good care of their health to continue with MMD service. Furthermore, this aided clients in adhering to providers' instructions and enabled the clients to maintain many months' prescriptions without returning to monthly dispensing, hence improving MMD uptake.

…. you know when someone is on MMD, it feels comfortable… there is a certain pleasure you get so even when we are returned to monthly prescriptions it feels bad…I try my best to make sure I don't go back to monthly medications by taking my medications as instructed, this service is very pleasant ([Client 5, Facility 1).

… the transport costs challenge motivates us to continue being on three months medications and one becomes motivated to follow providers' instructions on good drug use so as not to return to monthly medications (Client 4, Facility 2)

Clients' awareness of MMD

Respondents reported that awareness of good adherence to medications and clinic appointments facilitated clients to remain stable enough for MMD uptake. Providers also

reported conducting regular health education sessions on HIV, particularly on all factors related to being eligible to the patients to facilitate their eligibility status. This was reported to improve awareness of the uptake of MMD.

> Currently clients are more aware of the importance of drug adherence and storage concerning their health… the understanding of the clients is very important and we as providers continue to educate them on drug adherence to continue being stable for multi-month medications (Provider 1, Facility 1)

Peer clients' motivation

Increased demand through peer motivation was reported to encourage more clients' enrolment in MMD. The clients receiving MMD inspired those on monthly dispensing to take good care of their health to be enrolled in MMD. It was reported that the benefits of being on MMD include reduced waiting time during clinics and having more time to concentrate on other socio-economic activities that motivated and inspired those not on MMD.

> … If a client sees that his fellow has received three months medications, then he also gets motivated to follow provider's instructions accordingly so that he can also receive the same [three months medications] … we therefore encourage them to take good care of their health to be part of the service (Provider 2, Facility 3)

Barriers to the optimum uptake of MMD of art

Respondents were asked about barriers to the uptake of MMD and the analysis of findings generated two (2) subthemes, which were categorised based on health facility and individual factors (online supplemental table 2).

Health facility barriers

Health facility factors included inadequate drug supply of ARVs in the facilities, prolonged turn-around time of HVL results, delayed TB preventive therapy (TPT) initiation and staff shortage at CTC.

Inadequate drugs and equipment supply

Inadequate ARV drug supply was a reported barrier to the uptake of MMD since clients were switched back to 1 monthly despite being eligible for MMD. This was to accommodate the little stock of ARV at the health facilities, so that all clients get a chance to receive drugs regardless of the stock status. Facilities would request correctly but suppliers would delay drug delivery and most times bring fewer drugs than ordered which in the end in turn affects the uptake of MMD. Moreover, to a small extent inconsistent gloves supply hindered HIV viral load sample collection, which in turn affects the MMD uptake because HIV viral load is among the eligibility criteria for MMD.

> The biggest challenge is the shortage of medications, so it leads switching clients to monthly medications even if he has viral load suppression… we also get out of stock of gloves supply which makes it hard for us to take HIV viral load samples from patients… (Provider 4, Facility 1)

Moreover, it was reported that redistribution from nearby sites with enough stock was done to ensure the availability of drugs for the implementation of MMD. However, this was not successful since the issued drugs from the nearby facilities were insufficient to implement MMD, therefore eligible clients were still put on monthly dispensing like the unstable clients.

> No major challenge other than drugs availability, despite correct ordering of drugs still they do not deliver them timely which calls us to ask from nearby facilities where they also do not provide enough stock (Provider 2, Facility 3)

Prolonged turn-around time of HVL results

Delayed HVL results turn-around time affected MMD uptake because of the delayed decision-making on clients' categorisation of stable or unstable in the absence of the results. In addition, infrequent HVL machine maintenance contributed to the delayed/failed results, which in turn slowed down MMD uptake. This also discouraged clients because HVL sample collection had to be repeated because of laboratory technical failures.

> …In the short turn-around time of HVL results is still a problem and hinders much on MMD implementation… (Provider 2, Facility 2)

> What challenges us mostly is the viral load test, you find that the tests were taken timely but the results take longer due to faulty machines… (Provider 2, Facility 1)

Delayed TPT initiation

Delayed TPT initiation was reported to hinder MMD uptake because clients will remain unstable at the time of MMD initiation, which is 6 months after ART initiation. Therefore, clients will still have not completed TPT and hence be ineligible for MMD unless they finish their 6-month course of TPT before being switched to MMD.

> …. the challenge we see here is the issue of the TPT, the guideline requires us to return all clients to the unstable group even if they were stable before until 6 months of TPT completion that is when are stable enough to be returned on MMD (Provider 1, Facility 2)

Individual barriers

Individual factors included stigma and disclosure, providers trained for MMD not being the implementers and retention-related problems.

Stigma and disclosure

Stigma and disclosure were among the reported barriers to MMD uptake because clients who received 3–6 drug

containers failed to hide them as compared with the single monthly containers. This affected the client's drug adherence because of the unwanted disclosure to continue hiding their identity. Unwanted disclosure was also reported in public transport since they carried many drug containers.

> … now that he was to receive many drug containers because of MMD he became hesitant as he was questioning where to store the drugs scared to be exposed to his family members. It may be revealed to his relatives since he cannot put it in an envelope like before…maybe I should say that stigma exists if they are given too much medicine it becomes a burden to them… (Provider 1, Facility 1)

> …It is uncomfortable for us because now we carry many containers and so we are sometimes forced to change the containers for them not to make sounds while carrying them while in the public transport to avoid people thinking otherwise (Client 3, Facility 3)

Healthcare care providers trained for MMD not being the actual implementers

It was reported that failure to implement MMD efficiently was due to inappropriate choice of providers attending training since the ones who attend happen not to be the implementers hence hindering the service and creating a significant gap between eligible clients and those to be on MMD.

> … Also, those who go to training for these services are normally not the ones implementing the service, so you find many stable clients but are not on three month medications (Provider 2, Facility 3)

Retention-related problems

Missing appointments and Interruption in treatment were reported to affect MMD uptake. Clients who missed appointments were no longer stable for MMD and therefore switched to monthly dispensing despite meeting the other eligibility criteria according to the national policy and guidelines.

> The challenge is for those few who miss the appointment. It's a challenge that if a client misses an appointment twice, he automatically becomes unstable according to our protocol and therefore returned to monthly medications (Provider 5, Facility 1)

> …Another issue is perhaps the attendance of patients; you find the patient is stable on MMD but missing his appointment dates. The client has good viral load, CD4 high enough, and every other criterion is good but denies keeping his appointment dates therefore we are forced to return the client to monthly… (Provider 1, Facility 1)

DISCUSSION

This study sought to understand the facilitators and barriers to optimum MMD uptake in Morogoro Municipality, Tanzania. The facilitators for MMD uptake portrayed from this study included adherence to policy and guidelines and stakeholder involvement, providers' ability to identify eligible clients, providers' moral support, fast track services, timely collection of HVL, quality improvement strategies, client awareness, increased demand and peer–peer inspiration and clients' satisfaction. Reported barriers included unfavourable working environment, stigma and disclosure and interruption in treatment.

Adherence to policy and guidelines improved the uptake of MMD because providers were required to enrol all stable clients in MMD as per the guide. This echoed a study in South Africa that portrayed clear policies and guidance as enablers to scaling up the differentiated ART model.[17] The similarity in the study participants' characteristics could explain the similar findings because they are the first-hand implementers of MMD and both countries had adopted the 'treat all' policy and hence easily adopted MMD policy to account for the increased number of clients receiving care. Providers' high level of understanding of eligibility criteria for MMD clients was among the repeatedly reported enablers of MMD implementation in the study area. Adherence to policy and guidelines improved the uptake of MMD because providers were required to enrol all stable clients in MMD as per the guide. This echoed a study in South Africa, which portrayed clear policies and guidance as enablers to scale up the differentiated ART model.[17] The similarity in the study participants' characteristics could explain the similar findings because they are the first-hand implementers of MMD, and both countries had adopted the 'treat all' policy and hence easily adopted MMD policy to account for the increased number of clients receiving care. The providers' high level of understanding of eligibility criteria for MMD clients was among the repeatedly reported enablers of MMD implementation in the study area.

Implementation of quality improvement initiatives and timely collection of HVL samples reported to enable MMD implementation. Both appeared as new unpublished findings from the study. Continuous quality checks to identify gaps and create action plans through facility quality improvement teams assisted in improved service delivery such as timely collection. To timely classify clients as stable for MMD, timely HVL sample collection must be done. Quality checks fostered adherence to HVL sample collection algorithms and addition to providers' experience contributed much to effective MMD uptake.

Fast track refill model increased the uptake of MMD, which echoed studies conducted in Malawi and Zambia.[18 19] All study settings implemented a fast-track model, which can easily explain the similar insights into MMD uptake from both studies. The setup of a fast-track refill model motivated clients and providers because of decongestion and little waiting time at the clinics.

Clients highlighted that providers' moral support facilitated the uptake of MMD. This is consistent with the study conducted in Zambia, whereby patients were willing to travel a long distance and visit the clinic frequently given that the provider's attitude is positive.[11] Providers' attitude motivates clients to seek care and promote long-term adherence to drugs and appointments with the fear of disappointing their providers by not doing so. Community and facility healthcare workers collaborate hand in hand to ensure clients are followed up well and adhere to their medications, this close follow-up builds a good rapport between them and clients, which further motivates them to follow all instructions provided.

Peer motivation increased demand for MMD since clients on MMD inspired those not on MMD due to the preferential services they get unlike others, which in turn increased the demand for MMD. Clients' satisfaction through fewer clinic visits, reduced waiting time and travel costs were frequently reported as facilitating factors for MMD uptake. Clients got more time to focus on other socioeconomic activities something that motivated drug and clinic appointment adherence, which is among the stability criteria for MMD. Similar findings were reported by other studies in that it allowed clients to spend less time in the clinic and more time on other commitments.[17 19] The similarities among the studies could be attributed to similar study settings, participant characteristics and enhanced social behavioural change strategies through health education during clinics and in the community through community healthcare workers and expert clients. Moreover, in our study, setting it was also reported client's awareness of MMD and increased demand were among the enablers of MMD uptake, however, a study conducted in Uganda highlighted low patient literacy on differentiated service delivery as a gap in the enrolment of clients in differentiated service delivery. Patients had not been sufficiently sensitised on the merits of enrolment in DSD models and there remained demand-side gaps in knowledge and awareness about DSD.[20] This could be attributed to the differences in the education level of clients and health education practices in the clinics and community level in comparison to our study findings. Promotion of social behavioural change practices will potentiate knowledge among clients, leading to increased demand for MMD because of increased sensitisation.

Despite facilitating factors for MMD uptake, there are reported barriers that hinder the implementation of MMD in the study area. Inadequate ART supply hindered MMD uptake since clients were switched to monthly drugs despite being stable to accommodate the understock of ARVs. This echoed studies in Lesotho, Zambia and Uganda.[9 20 21] In addition, a study on Differentiated Care Preferences of Stable Patients on Antiretroviral Therapy in Zambia[9] had a similar study setting, unlike a study by Faturiyele *et al*,[21] which was limited to the community unlike our study, which drew participants from CTCs of the selected facilities. Nevertheless, both studies did not describe the redistribution of drugs from other sites as an enabler in drug stock out to accommodate MMD uptake, which was reported in our study. On the other hand, prolonged turn-around time of HVL results delayed the providers to decide if the client is eligible enough to start or continue with MMD. The delay of results could be affected at different implementation levels starting from delayed sample transportation, delayed arrival of sample transporters at facilities, infrequent machine maintenance and delayed feedback mechanisms from the testing hubs, which all in turn hinder optimum uptake of MMD.

Delayed TPT initiation affected MMD uptake because clients on TPT are unstable for MMD. Therefore, a delayed TPT initiation will also delay MMD enrolment regardless of meeting all other eligibility criteria. This aligns with a study in Uganda that portrayed difficulty in comprehending TB drugs with MMD implementation.[20] The similarities would be explained by similar contextual settings in service implementation, therefore clients would not be able to receive MMD even when attained all other criteria since they must be monitored monthly by a trained healthcare provider. Stigma and disclosure-hindered MMD uptake because clients received 3–6 drug containers as compared with monthly single containers, which were difficult to hide. This tapered down drug adherence at the cost of hiding their identities. This aligns with the study conducted in Malawi and Uganda.[19 20] This portrays that there are clients who do not prefer MMD despite being eligible, which is a new finding from our study.

Findings from other studies reported that MMD had facilitated adherence to appointments and drugs (retention) of clients and vice versa.[22 23] However, this contradicts the findings from our study, which portrayed that poor retention of clients by missing appointments and interruption in treatment affected the uptake of MMD. This is because they no longer remain stable for MMD and, therefore, switched to monthly dispensing despite meeting the other eligibility criteria. Factors like having given extra pills, transport costs, illnesses, weather constraints and socioeconomic activities may render them not aligned with their appointment dates, hence being switched to monthly dispensing. Moreover, these two studies differ from our study in that they were qualitative and systematic reviews, respectively.[22 23]

Limitations and strengths

To the best of our knowledge, this is the first qualitative study taking place in this population in Tanzania and Morogoro regions, hence providing grounds for further researchers to explore more into this area qualitatively and quantitatively.

Dependability was ensured through an in-depth methodological description of the study to enable future researchers to repeat the work.

Interviews were based on those clients who were on MMD to achieve our research objectives, leaving behind those who were once on MMD but now switched to monthly dispensing could also be rich in information on barriers and facilitators to MMD uptake.

In addition, the sample size of the study was relatively small, but participants were a mix of providers and patients

with different professional levels and lengths of treatment. However, further studies should address this to better characterise specific patient groups or distinctive enablers or barriers.

CONCLUSION AND RECOMMENDATION

In summary, this is the first qualitative study that worked on exploring enablers and barriers to optimum uptake of MMD among PLHIV in Tanzania. This study came up with new findings not known to be reported in other studies such as self-stigma due to carrying several drug containers, timely collection of HVL, HIV projects stakeholders' technical support and drug redistribution. Interestingly, some contradicting findings from other studies such as providers' knowledge as well as clients' retention were noted as enablers in one setting while a barrier in the other and vice versa. This is a call to further research on best practices to improve MMD uptake in both settings. Clients' preferences should be considered for those who wish to continue with monthly dispensing even if they are truly eligible for MMD to strengthen retention and self-management in ART uptake. Therefore, healthcare providers should work closely with PLHIV to identify specific barriers and facilitators to optimum MMD uptake that are specific to each client subjectively. Also, the policymakers should integrate lower level practitioners and even PLHIV in problem-solving and decision-making towards strengthening the enablers and alleviating the barriers that can further lead to an increase in MMD uptake. Findings from this study would provide a framework that the health system, in general, may use to structure MMD implementation while potentially highlighting some barriers or facilitators that may have not been considered previously.

Acknowledgements The authors would like to acknowledge the support from the Regional Medical Officer, District Medical Officer, Facility Medical In-charges, Research assistant (Dr Mangaro Mabusi), and all study participants.

Contributors NM is responsible for the overall content as a guarantor. NM and GF worked on conceptualization, formal analysis, methodology, writing original draft and reviewing. Data curation was done by NM and AA.

Funding The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

Competing interests None declared.

Patient and public involvement Patients and/or the public were involved in the design, or conduct, or reporting, or dissemination plans of this research. Refer to the Methods section for further details.

Patient consent for publication Not applicable.

Ethics approval Research and Publications Committee, MUHAS Research Policy and Tanzania Regulations governing human and animal subjects. Reference number: DA.282/298/01.C/. Participants gave informed consent to participate in the study before taking part.

Provenance and peer review Not commissioned; externally peer-reviewed.

Data availability statement Data are available upon reasonable request.

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Table 1: Socio-Demographic Characteristics of Study Participants

Characteristics	**Health care providers (N=9)**		**Clients (N=13)**	
Sex, No (%)				
Male	3(33)		2(15)	
Female	6(67)		11(85)	
Age (years), No (%)				
18-24	0(0)		0(0)	
25-34	4(44)		0(0)	
35-44	0(0)		5(38)	
45-55	3(33)		4(31)	
>55	5(23)		4(31)	
Level of education, No (%)				
Primary	2(22)		12(92)	
Secondary	4(45)		1(8)	
College/University	3(33)		0(0)	
Client's Occupation Status, No (%)				
Employed			2(15)	
Business			9(70)	
Farmer			2(15)	
Others specify			0(0)	
Clients' duration on ART (years), No (%)				
0-5			3(24)	
6-10			6(46)	
11-15			2(15)	
>15			2(15)	
Provider Cadres, No (%)				
Clinician	4(45)			
ART Nurse	2(22)			
Pharmacist	1(11)			
Community Health Worker	2(22)			
Work experience at CTC (years), No (%)				
<1	3(34)			
2-3	4(44)			
4-5	2(22)			

Table 2: Identified Main Themes and Sub-Themes Related to MMD Uptake

Themes	Sub-themes	Codes
Facilitators to the optimum uptake of MMD of ART	Health system factors	Policy and guidelines enable the uptake of MMD. Stakeholders support on MMD uptake
	Health facility factors	Service providers' ability to identify eligible clients for MMD and quality improvement uptake. Ongoing Health Care Providers' moral support to PLHIV. Fast track services of MMD clients Timely collection of HIV Viral load facilitates MMD uptake
	Individual factors	Client's satisfaction/pleasure from MMD service Little interference with client's socio-economic activities Peer clients' motivation increases the uptake of MMD Increasing client's demand for MMD Travel costs reduction Clients' awareness on MMD and its eligibility criteria
Barriers to the optimum uptake of MMD of ART	Health facility factors	Inadequate drug supply of ARVs in the facilities Prolonged turn-around time of HVL results Delayed TPT initiation Staff shortage at CTC
	Individual factors	Self and community stigma hinder MMD uptake
		Missing appointments and Interruption in treatment