

**Research Article** 

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Corresponding Author: Jafari Ibrahim Shabani, Centre of

Excellence in Health Monitoring and Evaluation, School of Public Administration and Management, Mzumbe University,

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# Effects of Multi-Months Dispensing Model on Antiretroviral Treatment Adherence: A Qualitative Evaluation Study of Youth Living with HIV

# Jafari Ibrahim Shabani<sup>1\*</sup>, Mackfallen G Anasel<sup>2</sup> and John Kashindye<sup>3</sup>

<sup>1</sup>Centre of Excellence in Health Monitoring and Evaluation, School of Public Administration and Management, Mzumbe University, Morogoro, Tanzania.

<sup>2</sup>Department of Health Systems Management, School of Public Administration and Management, Mzumbe University, Morogoro, Tanzania.

<sup>3</sup>USAID Afya Yangu Project, Dodoma, Tanzania.

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# Abstract

**Background:** Adherence to antiretroviral therapy is essential for effective HIV management, but frequent clinic visits can be challenging, particularly for youth living with HIV. The multi-month dispensing model aims to reduce clinic visits and improve adherence by providing several months' worth of medication at a time. This study explores the effects of the multi-month dispensing model on ART adherence among youth living with HIV in Dodoma City Council, Tanzania, to assess its effectiveness and identify any associated benefits and challenges.

**Methods:** A case study approach was used, focusing on youth living with HIV aged 18 to 45 years accessing anti-retroviraltherapy through multi-months services. A total of 15 participants were selected via convenience sampling, with healthcare providers chosen through purposive sampling. Data were collected through structured interview, transcribed, and analyzed thematically using ATLAS.ti software.

**Results:** The multi-month dispensing model led to several positive outcomes: reduced waiting times at clinics, decreased frequency of visits, and lower costs associated with travel and missed work. Participants also reported reduced stigma and increased confidentiality due to fewer clinic visits. However, concerns about the visibility and handling of larger quantities of medication were noted. The model improved adherence and enhanced quality of life for youth living with HIV by minimizing logistical and financial burdens.

**Conclusion:** The multi-month dispensing model effectively improves ART adherence among youth living with HIV by reducing the frequency of clinic visits, alleviating cost and logistical challenges, and decreasing stigma. The findings suggest that this model could be beneficial in similar settings, offering a practical solution for enhancing ART adherence and health outcomes for youth living with HIV.

Keywords: Multi Month Dispensing, Differentiated HIV Services, Antiretroviral Adherence, Qualitative Evaluation

# 1. Introduction

Addressing the global challenges of HIV/AIDs is paramount, with UNAIDs setting ambitious 2030 targets ensuring 95% diagnosis, 95% sustained antiretroviral therapy, and 95% viral load suppression [1]. Currently, the global scenario involves 38.4 million people living with HIV/AIDS, with 58% comprising the youth aged 18-45 [2]. However, adherence rates among the global youth (18-24 years) are 55.8%, indicating a gap in meeting the defined targets [3]. Psychosocial aspects such as fear of disclosure, depression, and family discouragement need to be analyzed to formulate

accurate interventions and policies, contributing to achieving UNAIDs ambitious goals and advancing global health research [4].

In the African context, 28.7 million people live with HIV/ AIDs out of a total population of 1,460,481,772. Among those affected, 59% are youth aged 18-45, totalling approximately 16,933,000 individuals. There is a concerning adherence gap, with only 65% of African youth in this age range adhering to their prescribed HIV/AIDs treatments, totalling 11,006,450 individuals. Issues such as lack of transportation

funds, distant healthcare facilities, negative attitudes from health workers, and inadequate support from partners and parents contribute to low adherence rates. This requires concerted efforts from governments, healthcare systems, and communities to bridge the adherence gap and improve health outcomes [5-10].

In Tanzania, HIV/AIDs impact 3.2 million individuals, accounting for 4.7% of the population of 66.46 million. Among those affected, 64% are youth aged 18-45, totalling around 1,999,116 individuals. Despite efforts, a notable adherence gap remains, with 73.2% of youth aged 18-45 adhering to antiretroviral therapy, with variations between genders (27% for males, 46.2% for females). This leaves a concerning gap of 535,763 (26.8%) youth not adhering to ART. Addressing gender-specific adherence disparities and identifying factors contributing to this gap is essential for targeted interventions [11].

In Dodoma, HIV/AIDs statistics show that 89,483 individuals, representing 2.9% of the population of 3,085,625, are living with HIV/AIDS. Among those affected, 14.6% are youth aged 18-45, totalling around 13,064.5 individuals. Despite this, 80% of youth aged 18-45 in Dodoma adhere to antiretroviral therapy, totalling 10,574 individuals. However, there is an annual gap of 2,490 ART users becoming non-adherent, which poses a challenge to meeting the ambitious targets of viral suppression by 2030. Innovative service delivery models tailored to individual patient needs are essential for improving coverage and retention in healthcare. The Differentiated Service Delivery model has emerged as a key framework to enhance access and quality of HIV care and treatment. This model acknowledges varying patient needs, requiring different levels of engagement with clinical teams. Differentiated care strategies include reduced clinic visits, task shifting, multi-month prescriptions, community or facility adherence groups, and community ART distribution groups [11,12].

In 2021, the Tanzania Ministry of Health integrated multimonth prescriptions into differentiated service delivery. Updates in August 2022 included a new clinical encounter form to capture patient status and differentiated service delivery type. Despite these initiatives, sustaining optimal ART adherence remains challenging, particularly among youth populations. Differentiated service delivery models like the multi-month dispensing model aim to decentralize HIV care and medication access, reducing the burden of frequent clinic visits and promoting adherence to ART. Studies such as those by have demonstrated the benefits of multi-month dispensing in improving retention and viral suppression. The present study aims to assess the effects of the multi-month model on ART adherence in Dodoma City Council [11-15].

# 2. Methods

#### 2.1 Study Design and Settings

The study employed a case study method to evaluate the multi-month dispensing model effects on adherence to antiretroviral therapy among youth living with HIV in Dodoma City Council.

#### 2.2 Sampling and Sample Size

The research adopted a sample size of 15 respondents, which, according to Boddy (2016), suggested practical research indicating that data saturation in a relatively homogeneous population could occur in 15 sample sizes. The study focused on patients aged 18 to 45 years who receive their ART in community-based services. Further, in terms of the sampling method, a convenience sampling method was used to include all youth recipients of ART who were present at the care and treatment center during data collection, chosen for its accessibility in engaging study participants. At the same time,15 healthcare providers were selected through purposive sampling.

#### 2.3 Data Collection

We managed to conduct fifteen (15) interviews with youth living with HIV through an exploration of the multi-month dispensing model implementation, whereby each interview took a range of eleven to fifteen minutes for each respondent. First, a structured interview guide with five parameters was created. These parameters included understanding multimonth dispensing, implementation guidelines, available dispensing points, eligibility requirements, and other pertinent information. The interview format provided by this guide allowed for uniform data gathering from all respondents. Second, participants were chosen using a purposive sample technique, which the researcher took into account their knowledge and familiarity with using the multimonth dispensing model. After being chosen, participants were contacted and given information about the purpose, methods, and their roles in offering insights. Then, we applied face-to-face interviews with the program implementers, held in a quiet area at his office, to promote candid conversation once informed consent was obtained. Then, we used a semistructured guide to direct questions and probed participants to get more detail on their comprehension and experiences with each metric. Probing techniques ensured the issue was thoroughly explored and deeper into particular areas of interest. All questions were asked in Swahili, the common language used in Tanzania.

To accurately document the precise comments, the interviews were audio recorded through an MP4 audio recorder and field notes were gathered to augment the recordings. Following completion, the recordings were verbatim transcribed, and the transcripts underwent thematic analysis to find recurrent themes, important takeaways, and insights about the multi-month dispensing mode's implementation.

#### 2.4 Data Analysis

A deductive method was used in the thematic analysis for the research. However, the interviews were conducted in Kiswahili, and the interview transcripts were initially transcribed. The subsequent analysis was carried out in English. Data were arranged based on preset objectives, and themes were identified using ATLAS. TI Version 7 software. The themes include shorter waiting times, concerns regarding confidentiality, adherence to clinical appointment Volume-3 Issue-2

schedules, motives for taking ART, reducing stigma during refills, and easing the burden of frequent clinic visits.

#### **2.5 Ethical Clarence**

The study portal obtained approval from the Mzumbe Directorate of Research, Publications, and Postgraduate Studies from Mzumbe University. In addition, permission for data collection was obtained from the Director Dodoma City Council. Lastly, written consent for participation was obtained from all the respondents before data collection started. Importantly, keeping human rights, protecting privacy and confidentiality by not collecting personally identifiable information, adhering to data collection protocols, and using the appropriate research tools and guidelines were ethical considerations during data collection and avoiding data fabrication and alteration was assured to the respondents.

#### 3. Results

This evaluation aims to determine the effects of multi-month antiretroviral therapy dispensing on adherence, particularly in local communities. The objective of multi-month ART dispensing in community settings is to reduce the frequency of clinic visits by reshuffling medication access over longer timeframes. It is expected that this model lead to increased adherence rates by lowering logistical challenges and rationalising medicine administration for HIV patients. The evaluation aims to determine if this community-based strategy successfully promotes continued ART adherence, hence improving health outcomes and reducing HIV transmission within the community.

#### **3.1 Demographic of Respondents**

There is diversity in the composition of the 18 interviewees based on their demographic characteristics. The age range of the responders was 15 to over 35 years old, with respondents consisting of individuals aged 26-35 years (56%), with fewer participants in the 15-25 years (28%) and 35 years and above (17%) age groups. Gender distribution is relatively balanced, with females slightly outnumbering males (55% vs. 45%). Educationally, the participants exhibit a diverse range, with 22% each having primary school, high school, college, and university or higher education, and a slightly lower representation of secondary school graduates (17%). This indicates a predominantly mid-aged group with a balanced gender representation and varied educational backgrounds. *(Table 1).* 

Variable	Level	Percentage (%)
Age (years)	Age, median [IQR]	20 [22-25]
	15-25	5(28%)
	26-35	10(56%)
	35 above	3(17%)
Gender	Female	10(55%)
	Male	8(45%)
Education	Primary school	4(22%)
	Secondary school	3(17%)
	High School	4(22%)
	College	4(22%)
	University or Higher	4(22%)

# **Table 1: Respondents Characteristics**

During the interview, two main categories of themes were identified. These are factors that facilitate and encourage, and factors that impede, leading to shorter waiting times, reduced dispensing intervals, decreased stigma, and increased confidentiality. A summary of each category is provided below (see Figure 1).



## Figure 1: Emerged Themes During Analysis

#### 3.2 Shorter Waiting Time

Participants have discussed the presence of shorter waiting times during drug refills as one of the motives that encourage them to adhere to ART. First of all, they recognise the role of time during the clinic, it enhanced them to take their ART and to conduct other social economic activities. One respondent had this to say; "Getting ART in multi-month dispensing saves me a ton of time waiting at the clinic. Now, I can easily go in and out without any trouble. It's a big help because I can stay on track with my treatment without spending hours at the clinic. Plus, it's way easier to remember when I need to pick up my meds because I don't have to do it as often." -Interview respondent P1 This change meant less time spent in waiting rooms and more time living life. The results were immediate and profound. Patients reported that ART refills had become fast and efficient, saving time and effort. As the respondent said. 'I have seen how ART refills have positively impacted my life. For example, I used to struggle to keep up with monthly clinic visits due to his busy work schedule. This led to missed doses and setbacks in his HIV treatment. However, since transitioning to multi-month refills, I have been more consistent with medication. I also appreciate the convenience of fewer clinic visits and feel more empowered to manage his health effectively. (Interview respondent P2).

#### 3.3 Easing the Burden of Frequent Clinic Visits

For those living with HIV, frequent clinic visits can be a heavy burden. A Care and Treatment Centre recipient shared her experience: This was revealed by one respondent who said "I visited the clinic every month, which was very expensive. Now, I only go every few months. It saves time and prevents missed doses, ensuring better treatment adherence. This sentiment was echoed by many". (Interview with respondent P3). Another youth added.

"Um, this is encouraging to me. After being enrolled, my cost for services has reduced because previously, I had to find money every month, which was very tiresome. However, for now, since I have been enrolled, I can perform other duties while I remember the date to refill my drug again. Mmmh. For me, I was in a one-month regime, but my doctor told me when I perform well and reach 40 copies, I will be enrolled in three months, which will be better and serve a lot". (Interview with respondent P4).

#### 3.4 Reducing Stigma During Refill

The factor that can influence adherence to ART is low stigmatisation, whereby when the recipient of care comes to the clinic, there should be a conducive environment to allow flexibility to utilise the service. To align with this component process, the need for client preference is very essential: the respondent revealed that "Mmmh... Transitioning to a threemonth brings comfort to care recipients because the new approach reduces the number of clinic visits. Initially, when patients start ART, many youths may attend clinics. However, fewer youth are seen at the clinics as patients continue their medication. This reduction in clinic visits helps to reduce stigma among patients. As a care recipient, I find this transition beneficial as it allows for a more discreet and less crowded environment during clinic visits, contributing to comfort and privacy." (Interview with respondent P5).

#### 3.5 The Concern of Confidentiality

Key informants were concerned that more significant numbers of ART bottles would result in unintended disclosure when transporting the medication and storing it at home. Patients were more concerned about the noise that the large number of bottles made. Respondent had this to respond. "I have one issue with them - the noise they generate. They are kept in containers and there are a lot of them, so they make a lot of noise, and I can't take them with me everywhere. I was concerned when a friend called me to come to her place. I was in a taxi and had to get off to go to her. I didn't feel good about it because I had my pills with me. I was reluctant to let go of my bag, thinking 'leave my bag alone.' I was stressed because even if I wanted to stay longer, I had to leave quickly as I couldn't go outside and leave my bag. Whenever I touched my bag, it made noise, and you could see that it contained pills. She asked me what was in my bag and what the pills were, but I couldn't tell her." (Interview with respondent P6). Motivation to adhere to ART is vital. Patients found innovative ways to remember their doses, from phone reminders to calendar alerts. Despite fears about medication misuse, most were highly self-motivated.

#### 3.6 Adhering to The Clinical Appointment Schedule

The creation of these model demonstrates the value of empowering youth living with HIV to actively participate in the selection of clinical appointment schedules and encouraging their treatment adherence. To enhance their access to treatment and modify their awareness through vouth's beliefs, values, and attitudes, they do this by acknowledging their position in the treatment. Through these initiatives, YLHIV to be facilitated to adhere to clinical schedules. "Let me share a story about our patient, who is living with HIV. Before, she had to go to the clinic every month to get her medication. It was tough for her because she had to take time off work, find someone to watch her kids, and travel to the clinic, which was far from her home. But now, with the new system, she only has to visit the clinic every three months. This change has made a big difference. She doesn't have to worry about missing work or finding childcare as often. It's much easier for her to stick to her appointments and stay on track with her treatment plan" (Interview with respondent P7). From this experience, it shows that the change in modality of improvise the flexibility on uptake of ART. During the interview with one of recipients of care share the practice that transitioning from monthly to quarterly ART refills significantly reduced clinic visits, work disruptions, and childcare, enhancing convenience, quality of life, and providing a sense of security. I quote by said. "Living with HIV used to be a real struggle for me, especially when it came to going to the clinic for my medication refills. Every month, I had to take time off work, find someone to watch my kids and spend hours waiting at the clinic. But then, my doctor told me about a new program where I could get three months' worth of medication at once. Now, instead of going to the clinic every month, I only have to go every three months. It's made such a difference in my life. I don't have to stress about missing work or finding childcare, and I Volume - 3 Issue - 2

have more time to focus on what I enjoy. Plus, knowing that I have a steady supply of medication for the next three months gives me peace of mind" (Interview with respondent P8). This reveals the difficulties youth living with HIV encounter getting access to medication, including balancing jobs and other responsibilities. These difficulties were lessened by a program that provided medication for three months, the importance and the significance of patient-centred treatment for raising their quality of life.

# 3.7 Motive to Take Art

Key informants were concerned that if patients were provided with larger quantities of medication, they would use it irresponsibly, adherence would worsen and seeking care when ill would be delayed until a scheduled appointment. They were also concerned about suboptimal storage of medication, that patients might share or sell medication or that it would be stolen. There were cases where they told us it was stolen. We know for a fact that drugs do get used for other purposes as well, and we know of instances where youth were collecting ART and selling it. But who knows, most of them had lost them, or they were stolen, or they don't know why they're finished (Interview with Recipient of Care 22 April 2024). The experiences reported by patients did not support these concerns; patients reported many mechanisms to remind them to take their treatment daily and attend appointments, including setting phone reminders, using calendars, timing their pills with popular television shows and asking family members to remind them.

#### 3.8 Cost Saving

Cost savings, as well as multi-month distribution, all contribute to a better o patient experience. Patients who receive multi-month dispensing have enough medication to last them for several months, which lowers the need for frequent clinic visits and the related expenses of lost income and transportation. This reduces the financial burden of obtaining healthcare services and saves patients time who would otherwise need to make repeated excursions to the clinic. "As for me, I take my medication every six months, which means I have to visit the clinic twice a year. This is very helpful because, in the past, I used to visit the clinic twelve times a month, which was very expensive. After all, it costs 24,000 Tsh just for travel. However, as of right now, I only pay 4,000 Tsh for transportation from my house to the clinic, so this model has been beneficial". (Interview with respondent P9). This experience demonstrates that the use of multimonth ART has been identified as the key to reducing costs and serving time; youth living with HIV are now able to carry doing their income-generating activities as they wait for a clinical schedule. According to another respondent, switching from a one-month ART enrolment to a three-month enrolment in multi-months dispensing helped her stick to her medication because the associated costs of services had decreased. Rather than paying the clinic monthly, the patient has money for other necessities and a small amount for returning to services. Three multi-months patients stated as follows: "Um, this is encouraging to me. After being enrolled, my cost for services has reduced because previously, I had to find money every month, which was very tiresome. However,

for now, since I have been enrolled, I can perform other duties while I remember the date to refill my medication. For me, I was on a one-month regimen, but my doctor told me that when I perform well and reach 40 copies, I will be enrolled in a three-month regimen, which will be better and more convenient." - Excerpt from an interview with respondent P10. Many recipients of ART treatments have acknowledged the value of ART that is dispensed over several months, and the majority of informants indicate that cost reduction over multi-month dispensing is important. There is a significant financial savings from not having to visit the clinic as often four times for patients with three months and twice for those with six months, which motivates more youth living with HIV to do well and receive multi-month dispensing.

#### 4. Discussion

The findings from the study align well with existing literature on the benefits and challenges associated with multimonth dispensing for antiretroviral therapy. This model, which allows patients to receive several months' worth of medication at once, has been associated with several positive outcomes, particularly for youth living with HIV in Dodoma City Council. The study showed that multi-month dispensing significantly improves ART adherence, which is crucial for maintaining viral suppression, reducing transmission risk, and enhancing quality of life. Consistent with findings by, adherence to ART regimens directly influences health outcomes, including viral suppression and reduced risk of transmission. The study confirms that MMD benefits, such as reduced clinic waits times, longer dispensing intervals, and decreased stigma, align with previous research emphasizing the importance of these factors for better adherence [16-20].

The study corroborates the significance of social determinants in adherence to ART, as highlighted by. Strong social networks and reduced stigma are critical for maintaining adherence, as they provide the necessary psychological and physical support for patients. Conversely, lack of social support or experiences of stigma can hinder adherence, as discussed by. Addressing stigma and building social support networks are essential for comprehensive HIV care [8-26].

The findings underscore the effectiveness of multi-month dispensing in improving adherence and health outcomes, which aligns with previous research. The model addresses key barriers such as transportation issues, stigma, and frequent clinic visits, contributing to better adherence and overall patient well-being. The study's results suggest that MMD not only simplifies access to medication but also fosters a supportive environment through peer support, education, and counselling [20].

Despite the benefits, the study also shows the challenges associated with multi-month dispensing. Logistical issues, including managing pharmaceutical supply chains and ensuring proper medication storage and distribution, remain significant obstacles. These challenges can impact the successful implementation and sustainability of multimonths dispensing model. Addressing these logistical concerns and regulatory constraints is become essential for maximizing the effectiveness of multi-months dispensing initiatives [27,28].

# 4.1 Strength and Limitation

The results of this study might not apply to areas or contexts other than Dodoma City Council. The unique traits and conditions of Dodoma City Council may have differed from those of other regions, which may have reduced the study's generalizability. Care should be taken when projecting the findings to other circumstances. Even though the study was thorough, there is a chance that the data on the variables affecting youth living with HIV and adoption of ART adherence may be lacking. The study might have included only some pertinent data or looked into every element that might have. This restriction might have made reaching conclusive results and making thorough recommendations more difficult.

# **5.** Conclusion

The evaluation demonstrates the potential of a multi-month model as a strategy to improve youth adherence to HIV therapy, with the aim of enhancing the health, knowledge, and empowerment of future generations. Based on the findings, it can be concluded that multi-month dispensing (MMD) has had a positive impact on adherence to antiretroviral therapy (ART) among youths living with HIV in Dodoma City council. MMD has reduced clinical visits and transportation costs to health facilities. It has also played a role in reducing health facility congestion, leading to longer doctor-patient interactions and ultimately resulting in higher levels of patient adherence to ART. In facilities funded by USAID Afya Yangu, multi-month dispensing expedites the distribution of antiretroviral therapy. With MMD, patients receive enough medication for several months at a time, reducing the need for frequent clinic visits. This not only helps patients and healthcare professionals save time and money, but also encourages improved adherence to ART treatment schedules and ultimately enhances the health of HIV/AIDS patients. The evidence from this study multi-month period has a number of advantageous benefits. These include easier access to medicine, less stigma, more affordable healthcare, and maybe better treatment plan adherence among youth living with HIV. But there are still a lot of obstacles to overcome, like privacy issues and the critical attitudes of healthcare providers. The study findings emphasise the significance of MMD in improving the provision of healthcare to those living with HIV/AIDs.

# **List of Abbreviation**

MMD - Multi-Months Dispensing Art - Antiretroviral Therapy YLHIV –Youth Living with Hiv

# **Funding Declaration**

The study was not funded by any external sources.

# **Clinical Trial Registration Details**

Since this study is not a clinical trial, there is no trial registration number or registry to provided.

# **Competing Interests**

The authors declare that they have no competing interests related to this study.

# **Consent for Publication**

All authors have agreed to the publication of the study. Participants provided consent for publication of their data.

# Availability of Data and Materials

The data supporting the findings of this study are available from the corresponding author upon reasonable request

#### **Tools Consent**

The interview used in this study was developed by researcher and it does not publish else were

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