Factors Contributing to Lost to Follow up on People Living with HIV, Bor State Hospital

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Abstract

Long-term regular follows up of ART clients is an important component of HIV care, treatment, and prevention. Clients who are lost to follow-up while on treatment compromise their own health leading to poor treatment outcomes, which has a negative impact on HIV control programs. This study aimed to determine the factors contributing to the lost to follow-up (LTFU) of HIV clients on ARVs at the ART clinic, Bor state hospital. A retrospective cohort study of 60 people living with HIV from 576 clients who are lost to follow-up and attending an ART clinic service between Jan. 2015 - Dec. 2019 was undertaken. LTFU was defined as not taking an ARVs drug refill for a period of three months or longer from the last attendance for refill and not yet classified as 'died' or 'transferred out. A total of 1993 clients enrolled at the HIV ART clinic, a total of 576 clients (29.0%) were defined as LTFU from enrolled clients, and 1417 clients (71.0%) were actively being followed up and on ART in the HIV ART clinic. Overall, these data suggested that LTFU in this study was high in patients who were married, low level of education, stigma-related factors, unemployment among clients, and clinical stages I &II were associated with LTFU in this study.

Keywords: Anti-retroviral therapy, ART, factors contributed to lost to follow up, HIV, lost to follow up, PLHIV, South Sudan.

Introduction

"Republic of South Sudan became the world's youngest nation when the people overwhelmingly voted to secede from the Republic of Sudan. It is a landlocked country in east-central Africa. South Sudan boundaries with Ethiopia to the east, Kenya to the southeast, Uganda to the south, the Democratic Republic of Congo to the southwest, and the Central African Republic to the west and shares a contested-undefined northern border with the Republic of Sudan. "The Republic of South Sudan covers a geographical area of approximately 640,000 square kilometers, at which the population is estimated at 8,260,490 million people majority of who are adherents of traditional tribal religions or Christianity, with a density of 15 people per square kilometer and more than 90% of the population lives in rural areas [1].

The average annual population growth rate is 2.2%, and the population is projected to increase to 12 million by 2015, due to both the annual growth rate and the return of South Sudanese from the diaspora, following the historic independence of the Republic of South Sudan [2].

Females constitute 52% of the population, while males account for 48%. The total fertility rate is estimated at 6.7, while the average life expectancy at birth for both sexes is 42 years [3].

South Sudan is endowed with vast natural resources, which include arable agricultural land, freshwater, minerals, and oil. On the contrary, income per capita is extremely low,

 with about half of the population (50.6%) living on less than 1 US\$ per day [4].

In addition to high levels of poverty and illiteracy, South Sudan has a high disease burden and low levels of education, which ranked as one of the poorest countries in the world [5].

Most of the population are in rural areas they are engaged in rural subsistence agriculture and cattle keeping, and most population live far from water sources hence their conditions are associated with poor access to clean drinking water (less than 50%), poor access to proper sanitation (less than 7%) and high illiteracy rates among the adult population (88% among women and 63% among men) [6].

The scale up health care services and establishment of anti-retroviral therapy (ART) centers has transformed national HIV program positively impacted responses and has population health. Regular use of ARVs has been shown to reduce HIV transmission and HIV-related complications and mortality. In 2012, 9.7 million people received ART in lowmiddle-income countries (LMICs) and, as of 2013, ARVs had reduced and prevented an estimated of 4.2 million deaths in LMICs during 2002 - 2012. However, while increased access to ARVs drugs and center of care has continued throughout the world, disparities in ART centers access still exist [7].

Although with these improvement and highly successful programmatic coverage with ARVs drugs, still significant numbers of adults and children drop out of treatment and care at various centers along the treatment centers, care, and prevention and program did not to reach enough children and adolescents on treatment retention. It is crucial to cross checked the reasons on how and why people drop out of treatment programs since retention of people on ART and ensuring adherence to treatment are critical determinants of successful long-term outcomes [8].

Some studies in sub-Saharan Africa have shown that most people who test HIV-positive are lost to follow up between testing centers and being enrolled site and on care follow up [9].

According to Berheto.: Predictors of LTFU in patients on ART, for eligibility of therapy, and the people rolled out that eligible for ARVs are then lost between eligibility assessment and enrollment on ART [10].

Data from 23 African countries indicate that average retention for people living with HIV on ART reduced over time, that show Loss to follow-up (LTFU) rings negatively impacts the immunological benefit of ARVs and increases AIDS-related complications, mortality, and hospitalizations. Lost to follow-up in clients receiving ARVs can result in serious consequences, such as discontinuation of treatment, drug toxicity, treatment failure due to poor adherence, and drug resistance, and this may lead to an increased risk of death of up to 40% in studies of patients LTFU in sub-Saharan Africa [11].

The results from poor nutritional status, lower CD4 count, Tuberculosis (TB) co-infection, advanced clinical staging, younger age, adverse drug reactions, gaps in services, and accessibility to services are consider strongly contributing factors reported to be associated with lost to follow-up [12].

Tuberculosis and HIV/AIDS rank high among the top 10 causes of morbidity and mortality endemic in the country [13].

"The South Sudan HIV programme was established in 2006, and since then, it had undergone numerous developments and changes, particularly during more recent times when internal conflict and population displacement created major challenges for continuity and access in many locations across the country [14].

The HIV epidemic in South Sudan is characterized as both a low generalized and concentrated, having an average adult HIV prevalence at 2.7% but with some population groups and certain geographic regions and hotspots 5% and higher [15]. The pattern calls for more concerted and differentiated approaches for service delivery within the same national response [16]. This average adult HIV

prevalence translates to about 200,000 people living with HIV in South Sudan, using an estimated total population of about 12 million [17]. The country has geographic areas (Eastern, Central, and Western Equatoria) with high HIV concentration accounting for 60% of new HIV infections [18].

By the end of 2018, 24% of the estimated people living with HIV had been tested and knew their status whilst 67% of those who knew their status were on anti-retroviral therapy (ART) [19].

"According to the ministry of health, only 32% of people living with HIV (PLHIV) in the country know their HIV status, and while only 14% of them are on treatment, care, and prevention. These rates show poor HIV services provision and extremely low as per the UNAIDS treatment for all strategies, which targets 90% [20].

"According to UNAIDS South Sudan in 2018:

- 1. 190,000 people were living with HIV.
- 2. HIV incidence per 1000 uninfected, the number of new HIV infections among the uninfected population over one year, among all people of all ages was 1.56.
- 3. HIV prevalence, the percentage of people living with HIV among adults (15–49 years) was 2.5%.
- 4. 19,000 people were newly infected with HIV.
- 5. 9,900 people died from an AIDS-related illness [21].

"According to UNAIDS 2016 estimates; 40% of the annual HIV infection is very high in younger aged 15-24 years, and reached to 60% of the new infections are mostly females and higher records in deaths rate compared to males, however; while AIDS-related deaths declined by 1% between 2010 - 2016 in girls and women; there was an increase by 12% in relation to the male gender, which shown about 70% of PLHIV on treatment, care and prevention were women [22].

"The most recent of these periods occurred in 2016. Since then, the programme has been recovering and has continued to expand, with the 'test and treat approach, which was introduced in 2017, and since 2018, viral load analysis has been available to a growing number of PLHIV and on ART in most of the health facilities in the country. The alarming low levels of HIV/AIDS awareness across South Sudan could be greatly improved by well-structured investment in education across the country [23].

Investments in quality healthcare services, such as well-equipped clinics and accessible hospitals across the country, will provide the needed testing and treatment centers for HIV/AIDS [24].

"HIV prevalence in South Sudan has already reached epidemic levels at 2.6 % in the general population and as high as 30% among high-risk groups in border areas. An HIV prevalence survey among TB patients conducted in all ten states in South Sudan in 2011 revealed that 14.7% were co-infected with HIV. However, the NTP routine HIV testing data of 2012 among TB patients showed 11.5% HIV positive, with 51.4% of TB patients tested for HIV [25].

HIV Incidence according to the 2014 mode of transmission (UNAIDS, MOT 2014), primary mode of infection of HIV is heterosexual exposure, which can indicate that transmission is mainly by either heterosexual contact mother-to-child or transmission during pregnancy, at birth, and through breastfeeding [26]. The biggest proportion of new infections was registered in clients of sex workers (42.6%). Children born by HIV-infected mothers accounted for 15.7%, men women involved in casual sexual relationships accounted for 14.5% of new infections, female sex workers contributed 11.2%, and couples in unions or stable relationships accounted for 9%. Other modes contributing to infections include men who have sex with men (3.9%), partners of the key affected populations (0.6%), and partners of those who engage in casual sex (1.6%). Medical injections

and blood transfusions are estimated at 0.02% of the total infections in 2014 [27].

"Jonglei, which covers an area of 122,581 square kilometers (47,329 square miles), forms the largest of the eastern part of South Sudan, covering most of the eastern center; located in greater Jonglei, it is bordered by Upper Nile State to the north, Unity State to the northwest and Lakes state to the west, Central Equatoria to the southwest, Eastern Equatoria to the south, and Ethiopia to the east, and it economy is mostly dependent upon livestock, and agropastoralists, combining cattle-rearing with wet season agriculture according to the rains, and fishing along White Nile River [28].

The principal town is Bor, which lies in the southwest of the state. Other towns in greater Jonglei are Akobo, Ayod, Fangak, Padak, Yaui, Pibor, Pochalla and Waat and others [29].

The main rivers are the White Nile, which flows from the western part of the state, and the Akobo and Pibor rivers, which flow in the central-east, and its tributaries drain a watershed 10,000 km² (3,900 sq mi) in size [30].

Recently Jonglei state has experienced massive migration or displacement within and

outside South Sudan due to insecurity and flooding (internally to Awerial, Mangalla, Nimule, Juba, and Kakuma in Kenya) [31].

Bor State Hospital is the main hospital in Jonglei State located in Bor town. There are others rural hospitals, and primary health care centers (PHCCs), and primary health care units (PHCUs) that complement services offered by Bor State Hospital. According to a 2012 survey conducted by the national government, Jonglei state was found to have an HIV infection prevalence rate of 1.3 %, while Western Equatoria state topped with 6.8%.

General and Specific national program objectives are to assess the factors contributing to loss to follow up on people living with HIV enrolled on ARVs, care, and prevention.

And to identify factors contributing to lost to follow up, to assess knowledge of people living with HIV on treatment and adherence, to measure the attitude of health care providers on people living with HIV /AIDS and challenges that are related to the supply chain management system to support the scale-up of HIV care, treatment.

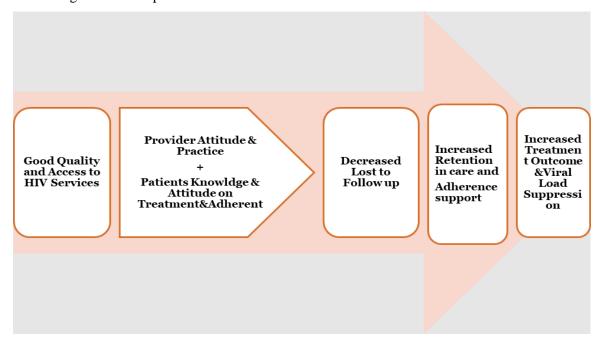


Figure 1. Conceptual Frame Works

Hypothesis testing "The incidence of LTFU in public health facilities in South Sudan is very

high and is associated with factors as well as being underweight, not having a telephone contact to receive reminders, and receiving treatment and care at lower-level facilities. Early diagnosis and enrollment(T&T), and routine use of client address locator forms can improve the quality of HIV services at lower-level health facilities and may reduce lost to follow-up among PLHIV.

Problem statement "In this research at ART center Bor State Hospital, LTFU constituted a major problem, which may apply to other similar ART facilities within the state. More than half of the clients were lost to follow-up shortly after enrolment, possibly implying high morbidity and mortality. Thus, clients' retention should have more effort and priority from the HIV program.

This study was conducted at the HIV ART clinic in Bor state hospital only because of the reasons mentioned above, despite the selection of Panyagoor county hospital and Pochalla Hospital in Jonglei State.

Study population, HIV lost to follow-up clients who are enrolled in the HIV ART clinic at Bor state hospital, from the age of 5 years and above.

Study period, the study period was from 1st Jan. 2015 to 31st Dec. 2019.

Sample size was taken from lost to follow up among the enrolled HIV ART client's register, in ART treatment registers, ANC PMTCT, and Maternity PMTCT registers.

Sampling technique, Purposive sampling method was used in which files of HIV ART clients from the above-mentioned period was taken to identify the number of lost to follow up in the ART clinic from Jan. 2015 – Dec. 2019, files for individual lost to follow-up due to any factors that could be contributed to the loss to follow up was extracted for review and trace for the quality of services provided.

The inclusion criteria were for all HIV clients who are enrolled in an HIV ART clinic at Bor State Hospital, from age 5 years and above.

Exclusion criteria children living with HIV under age of five years and are lost to follow-up have been excluded from the study.

Method of data collection, this research used both quantitative and qualitative Quantitative data was collected from the period of Jan. 2015 - Dec. 2019 from HIV ART registers, ANC PMTCT, Maternity registers, routine patient treatment cards, and monthly Reporting Forms, while qualitative data was collected from the participants by using interviews and questionnaires to assess the availability of ARVs drugs, OIs drugs and HIV supplies in the health facilities and the quality of HIV ART services. The participants include PLHIV, ART clinicians, Data clerks, and ART in charge.

Ethical clearance for this study was approved by the ethical review research board from the National Ministry of Health, the Republic of South Sudan. The study assured us of the secrecy of information taken from the participants. Also, the participants were informed that their participations were voluntary, in that they have the right to withdraw or decline from the study at any time, with full consideration of the participant's consent.

Study designed is a retrospective cohort study carried out on all clients who enrolled on ARVs, and they are lost to follow-up at Bor state hospital. The study used quantitative and qualitative data collection methods. For quantitative data collection, a retrospective review of participants' medical files was used to collect data on:

- 1. Participants' demographics,
- 2. Date of ART initiation,
- 3. WHO clinical stages,
- 4. Patient status by December 2019, as well as the level of health facility, attended (Hospital).

For qualitative data collection, key informant interviews (KIIs) and in-depth interviews were carried out to explore the reasons for lost follow-up from HIV treatment, care, and prevention. Data collected included:

- 1. Distance from home to health facility,
- 2. Economic status.
- 3. The capacity of the ART clinics,

- 4. Stigma and discrimination,
- 5. Waiting time at the clinic,
- 6. Conduct of the clinic staff.

The KIIs involved one clinical officer and one expert client selected from the ART center among the highest incidence of lost to follow-up, participants in the KIIs were selected using purposive sampling based on their knowledge and role in the management of HIV clients, the in-depth interviews involved clients receiving care from the selected HCFs, the clients' homes were traced, using the telephone contact extracted, and community tracing team from the ART cards, to conduct the interviews. The KIIs were conducted by the principal Investigator, whereas the in-depth interviews were conducted by Research Assistants. For all interviews are conducted using an interview questionnaire developed for this study.

Result analysis, the database was recorded in Microsoft Excel, reviewed for its consistencies and completeness, and then cleaned and edited prior to performing analysis in SPSS 20.0, and the patient characteristics were described in terms of mean/median or percentage, as appropriate.

- 1. Bor State Hospital, data from 60 clients.
- 2. Panyagoor County Hospital zero data due to flooding in the area.
- 3. Pochalla Hospital zero data due to flooding.

The total number of clients who are lost to Follow Up from the HIV ART clinic in Bor state Hospital as of Dec. 2019 were 576 clients (576/1993*100) = 29%. These figures were obtained from client's data dated from the year 2015 to 2019, a time when most of the HIV care clinics were started after the war.

Results from the selected study areas (Bor, Panyagoor, and Pochalla hospitals) only data

was taken from Bor hospital because the other two hospitals were affected by flood and insecurity. A total of 1993 clients enrolled on the HIV ART clinic in comparison to the total of 29.0% (n = 576) patients who were defined as LTFU, and the incidence rate of LTFU was 289 per 1000 person-years in the first year on ART and has increased to 578 per 1000 person-years in the 5th year of taking ART.

The median follow-up period for clients lost to follow-up was 3 months, and at the end of the follow-up period, 71.0% (n = 1417) were actively being followed up and on ART. At Bor state hospital between Jan. 2015 and Dec. 2019, 60 clients were included in the study of statistical analysis, and the mean (standard deviation) age of the study was 58 (97%) and 2 (3.3) for adults, adolescents, and children, respectively. 38 (63.3%) clients were female, and there was a higher number of females in the adult groups. Most of the clients enrolled in the study are within the reproductive age, and only about 11.3% are in the extremities of the age.

Most of them are female, 63.3%, and about 83% of them are married. Concerning occupational status 13 of them (21.7%) are self-employed, and 46 (76.7) are government unemployed. Around 53 of them (88%) had an educational level of lower than primary school, with the majority 36 (60%) with no formal school attended. In addition to, factors are contributing to LTFU included not having a good counselor for status disclosure, being unemployed, low-level education, and WHO clinical stage I & II of denial. Clients that previously had an ARVs adverse event had a lower risk of becoming LTFU than those that had not.

Table 1. Characteristics of HIV Clients Who are LTFU in Bor State Hospital

Characteristics	Frequency N= 60	Percent (%)
Age group (in years)		
5-19	2	3.3
20-29	13	21.1
30-39	24	40

	1	T	
40-49	16	26.7	
50 & above	5	8.3	
Gender			
Male	21	35	
Female	38	63.3	
Not documented	1	1.7	
Marital status			
Not Married	3	5	
Married/Separated	50	83.3	
Widowed	1	1.7	
Educational level			
No formal school	36	60	
Primary level	17	28.3	
Secondary level	6	10	
High school	0	0	
Occupation			
Self employed	13	21.7	
Government unemployed	46	76.7	
Not documented	1	1.7	

Most clients have mobile phones for easy contacts and follow-up but no network coverage and most of the clients (88.3) are in the early WHO clinical stages (stages 1 & 2) and show no sign of TB.

The majority of clients are satisfied with the services and declare that they get the necessary support from the health care providers.

Despite good support from others (health providers and the community) still, a majority of 83.3% of HIV clients still feel discriminated against in the family and community environment.

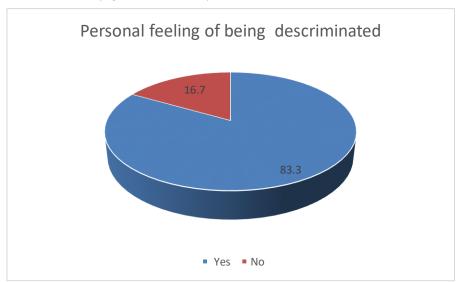


Figure 2. Most Clients are Feeling Discriminated against in their Community

Although most of the clients appreciate the benefits of ARV on their health yet, a fraction of them do not see or are not sure about the benefits

(1.2 & 3.5%, respectively). In chart 3, ARVs are being well managed, although there was no indication whether there has been any stock out

of ARVs or not.

New TB co-infection is low among the clients who are lost to follow-up, representing 2 (3.3%) based on the study outcome and were due to a regimen substitution that switched to dolutegravir as new treatment regimen.

The table shows other factors that contribute to lost to follow-up, which was in a multivariate Cox regression model that included, Lack of knowledge about the benefits of ARVs, 38 (63.3%), Fear of side effect of HIV drugs, 17 (28.3%), Low-risk perception about the benefits of the ARVs, 3 (5.0%), Poor quality of services, 1 (1.7) and unsupportive attitude of health care providers 1 (1.7).

Discussion in South Sudan found that the reasons contributing to LTFU were a Lack of knowledge about the benefits of ARVs drugs, which constituted 63.33% of the total respondents.

Many studies have been conducted and shown that lost to follow-up poses challenges to the successful implementation of HIV control programs in South Sudan. During this research, the incidence rate was estimated to be 289 per 1000 people per month at Bor state hospital. Other research shows that clients discontinued ARVs developed complication that lead to high viral load, pushing them at risk of developing opportunistic infections and leading to early death. The majority of the clients contacted through phone calls claimed that they had relocated and therefore sought medication to the nearest health facilities due to insecurity and flooding in their areas. Some claimed they were not sick and hence decided not to seek care. Most married women were LTFU due to stigma or fear from their partners in disclosing their HIV status.

The young and teenage clients were also LTFU, either because of lacked support from their immediate caregivers mainly the grandparents, as they were orphans, while some had relocated with their parents who were also not in care. From most clients who are LTFU were female against male, with these, there are a lot of patients who claim not to have money for

distance to cross or reach the hospital for collection of ARVs that could contribute to increase LTFU.

In addition, to address the issues of associated risk factors for lost to follow up is necessary to maintain adherence counseling and intervention in clients who are lost to follow-up. In this review, it was presumed that the prevalence of lost to follow-up from ARVs was 26.7%, higher than that reported in other countries in the continent, however, HIV ART centers in the United Kingdom have reported a lost to follow-up of about 38.8%; of these, after intensive tracking activities for true data outcomes.

51.7% were found to be lost to follow-up, either they are from those who were alive but had stopped their ARVs or those who are not tracked. Lost to follow-up is not only in Low Middle Income Countries problem.

Factors that contributed to the high incidence rate of lost to follow-up have resulted from poor client tracking in the low-income settings and lack of clear physical address and proper reporting of the risk of death events that can be considered as LTFU. Our study found that adults are becoming lost to follow-up than children due to stigma, a study from Uganda confirmed that the incidence of mortality was lower in children; then adults. This may show that the increased risk factors of death impact on adult age group.

Children mark as less exposed to stigma and discrimination, which confirms two common factors for LTFU affecting the adult age group, and the guardians or parents are more likely to look after children that reducing LTFU, which improved or reduced lost to follow-up in Children.

During adolescence, several challenges have been identified that may compromise positive outcomes from HIV care.

Past research has also shown that adherence has reduced in adult age in comparison with children. We detected gender variances as far as lost to follow-up concern, in comparison with other research, and the outcome was that males are more likely to become lost to follow-up and it due to many reasons, in mobility and a high risk of men being targeted, that may interfere with adherence.

The realization of a difference between male and female was compromised in this research due to cultural influences such as women take charge of family care, and they are too close to health facilities, especially during pregnancy (ANC) follow-up and stigmas.

Clients with WHO clinical stage III and IV on enrollment were not prone to be lost to followup; this contrasts with other African studies, which have shown the opposite.

Our research has proved that clinical stage III and IV clients have increased health-seeking behaviour, and this leads to more awareness that results in increased awareness of the community.

Outside Africa, a Swiss study showed a statistically non-significant trend, but a French study, like ours, showed that a history of an AIDS-defining illness was associated with reduced LTFU.

TB as one of the opportunistic, is an account for all morbidity and mortality in people living with HIV, including those on ARVs. However, we saw no significant association between LTFU status and TB co-infection.

Clients who had changed their regimen during the follow-up period were at higher risk of lost to follow-up. Similar research to an Indian study that reported that changing of drugs can be a risk factor for ARVs lost to follow-up. Most regimens shifting to new regimens in this study were due to the effectiveness of new medication.

The fear of stigma, unemployment, low level of education, side-effects and unsupported health care provider are known to be a major cause of lost to follow-up, these subgroups of patients who lose believed in the program, irrespective of the reasons for changing the regimen, it needs to have more effort on adherence counseling sessions to preserve retention on new ARVs.

It has been acknowledged that once taking long period on ARVs more he will be prone to develop the chance of lost to follow-up, if no good monitoring and adherence counseling during treatment and care.

The high factors contributing to LTFU after enrollment on ARVs were accounts on lack in counseling sessions while refilling, assessment of ARVs outcomes by the health care provider, and tracing service by cell phones and home tracker.

The main drawback of this service in this community are assumed to be HIV status disclosure, limited education, unemployment, limited coverage of network, and long distance to the health facilities. This finding was found, matching together with much research, that most clients are lost to follow up during the first year on ARVs.

This has been suggested to be due to low effort on adherence counseling and awareness on ARVs used on beneficial and client productivity.

This research had some limitations that resulted from poor tracking of clients in the ART program's mentoring, monitoring and evaluation system, clients who were lost to follow-up may have died or self-transferred to other health facilities.

The concerted influences of these factors may affect the accuracy of data record-keeping procedures in this clinic. Decreasing LTFU clients through the provision of mentorship, monitoring, and tracking client systems is crucial for reducing early mortality and complications of HIV, reducing viral transmission and ensuring the success of ARVs programs.

In conclusion, this research finding found that the main factor that contributed to LTFU was the Lack of knowledge about the benefits of ARVs drugs, which constituted 63.33% of the total respondents.

In comparison with the high rate of lost follow-up at HIV ART clinic in Bor state hospital, due to a poor knowledge for adherent counselor on status disclosure (stigma), being un-employed, low level of education, long distance and WHO clinical stage I & II of client's denial, and regimen substitution were

found to be contributing factors for LTFU.

The lost to follow-up is of particular importance to HIV/Hepatitis/ STIs control programs in the preventive health services NMOH, because they risk not only their own life, but also contribute to increased HIV transmission and can lead to the development of drug resistance due to clients lost to follow up.

Recommendations

- Improved comprehensive counseling sessions, monitoring or follow-up, and introducing clients tracking and mentorship may improve in reducing LTFU to an acceptable level.
- 2. The study results highlighted the need to better understand of the health-seeking behaviors of clients with ARVs drugs and to put more effort on adherence counseling sessions in HIV clinics and support peer groups for better tracking services and minimizing LTFU from HIV treatment, care, and prevention.
- 3. Change in ways of tracing services like community education (awareness).
- 4. Scale up of health extension services to the community.
- Nutritional support to people living with HIV will have a positive impact in decreasing LTFU and increasing the retention of HIV clients on ART.
- 6. Increasing support of adherence counseling sessions by health care providers.
- Train health care providers likewise provide the incentive to staff working at HIV ART clinics may reduce LTFU.
- Integration of HIV within essential PHC package & Nutrition in government health institutions to bring HIV ART services close to the community.
- 9. Strengthen data management, recording,

- and monitoring for HIV ART data in health facilities.
- 10. Further studies need to be conducted to address the profiles of lost to follow-up clients, and the associated factors are required for more clarity.

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None reported.

Conflict of Interest

The author declares that there is No Conflict of Interest.

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