ADHERENCE TO ANTIRETROVIRAL THERAPY AND ASSOCIATED FACTORS

AMONG ADULT PEOPLE LIVING WITH HIV/AIDS: THE CASE OF YERGALEM HEALTH CENTER, SOUTHERN, ETHIOPIA

MSW Dissertation Research Project

(MSWP-001)

BY

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DECLARATION

I hear by declare that the dissertation entitled "**Adherence to Antiretroviral Therapy and Associated Factors among Adult People Living with HIV/AIDS at Yergalem Health Center, Yergalem, southern Ethiopia** "submitted by me for the partial fulfillment of Masters of social work (MSW) to Indira Gandhi National Open University (IGNOU),Addis Ababa is my original work and has not been submitted earlier ,either to IGNOU or to any other institution for the fulfillment of the requirements for any other programmme of study .I also declare that no chapter of this manuscript in whole or in part is lifted and incorporated in this report from any earlier work done by me or others.

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Certificate

This is to certify that **Mis.Hanna Reta** who is student of MSW from Indira Gandhi National Open University (IGNOU), Addis Ababa was working under my supervision and guidance for her project work for the course **MSWP-001**.Her project work entitled "**Adherence to Antiretroviral Therapy and Associated Factors among Adult People Living with HIV/AIDS at Yergalem Health Center, Yergalem, southern Ethiopia** "which is submitted her genuine and original work.

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Acronyms and Abbreviations

AIDS   Acquired Immune Deficiency Syndrome

ARV   Antiretroviral

ART   Antiretroviral Therapy

EDHS   Ethiopia Demographic and Health Survey

FDG   Focused Group Discussion

EHNRI   Ethiopian Health Nutrition and Research Institute

FHAPCO   Federal HIV/AIDS Prevention and Control Office

FMOH   Federal Ministry of Health

HIV   Human Immunodeficiency Virus

HAART   Highly active antiretroviral therapy

I-TEACH   International Training and Education Center on HIV/AIDS

PLWHIV   People living with HIV

RHB   Regional Heath Bureau

SNNPR   South Nations Nationalities People Region

USAIDS   United States agency for international development

WHO   World Health Organization

ABSTRACT

The aim of the study is to assess the magnitude of adherence to antiretroviral therapy (ART) and associated factors among PLWH attending ART clinic at Yergalem Health center in Yergalem town, southern Ethiopia. Both qualitative and quantitative facility based cross-sectional study design was used and data were collected by interviewing 80 study participants using structured questionnaire ,5 FGDs and in-depth interview with two health care workers conducted. The research finding revealed 89% of the study participants had optimal adherence in the past Seven days. And, the non adherence rate was 11%. Disclosure (p=0.000), reminder use (p=0.000) and patients satisfaction from the improvement they get from treatment (p=0.01) were found to be associated with ART adherence positively. results of the qualitative study revealed that disclosure of HIV status, social support, use of reminders, life-long projects, counseling and education, and improved health on ART facilitated medication adherence and retention in HIV care. While economic constraints, with fear of stigma and discrimination, religious healing (Prayer), poor healthcare services were perceived as barrier for good adherence. Adherence improving interventions should be emphasized to address multi-faceted problems. To improve the level of adherence Health care workers; case managers/adherence supporters should promote disclosure of their HIV status to their families, relatives or friend. Intervention to promote adherence should focus on area of promoting use of different memory aids like watches, mobiles. Quality of care in terms of service quality, medication and laboratory supply availability need to be improved.

CHAPTER ONE

1. Introduction

1.1. Back ground

Worldwide HIV/AIDS has created an enormous challenge on the survival of mankind. Since its recognition, more than 70 million people have been infected with the HIV virus and about 35 million people have died of HIV. Globally, 36.7 million [34.0–39.8 million] people were living with HIV at the end of 2015. An estimated 0.8% [0.7-0.9%] of adults aged 15–49 years worldwide is living with HIV, although the burden of the epidemic continues to vary considerably between countries and regions. Sub-Saharan Africa remains most severely affected, with nearly 1 in every 25 adults (4.4%) living with HIV and accounting for nearly 70% of the people living with HIV worldwide and over 25 million have already died due to AIDS (WHO,2016).

Currently only 60% of people with HIV know their status. The remaining 40% (over 14 million people) still need to access HIV testing services. As of June 2016, 18.2 million people living with HIV were accessing antiretroviral therapy (ART) globally, up from 15.8 million in June 2015, 7.5 million in 2010, and less than one million in 2000 (PEPFAR& Global ,2016).

In Ethiopia based on 2016 EDHS report, HIV adult prevalence is estimated to be 1.18%.there were an estimated 718,500 people living with HIV from this, Adults were 653,412 (91%) and Children: 65,088 (9%) and 437,763 Female (60%) and 284,737 Male (40%)including children. Though there is a significant reduction in AIDs related deaths, about 73% compared to 2007 in 2016 still HIV is killing many. Around 19,743 deaths were reported in 2016.Among the total deaths 16% were children of under fourteen years and 58% of them were females. (FHAPC 2017)

Regarding the prevalence of HIV in SNNPR, the estimated prevalence is 0.54% which is low relative to other regions and administrative towns like, Gambella and the urban administrations of Addis Ababa and Dire Dawa. However; due to large population size Oromia and SNNPR regional states still bear a significant proportion of the epidemic burden (EHNRI and FMOH 2017).

The development of highly effective antiretroviral drugs represented a major turning point by allowing people living with HIV to live long and healthy lives. Ethiopia has achieved exemplary successes in terms of HIV service expansion, and uptake, which impacted to a 90% decline of new HIV infection and 73 % reduction of AIDS deaths compared to the periods 2006 and 2016 respectively. However, lack of adherence to ART is a major challenge to AIDS care. Adherence is taking the correct dose of medications, on schedule, and following dietary instructions (SNNPR, RHB 2017). Poor adherence is linked to the development of drug resistance, higher mortality rates, lower rates of increase in CD4 cell count, lower rates of undetectable viral load, lower therapeutic success and increased hospital days (Hogan D, Salomon J, 2010).

In relation to retention to care in Ethiopia, by the end of June 2013 the number of people ever enrolled in chronic care reached 728,874 while the number ever started ART was 439,301 and 317,443 were currently receiving ART (SNNPR, RHB 2016).

Only 70.3% of individuals who ever started ART were currently on treatment indicating challenges in patients' retention. Patient loss to follow-up and ensuring adherence to ART regimens remain major challenges of the ART program across the regions (FHAPCO, 2014).

Reasons reported for non-adherence in two studies in Addis Ababa, are being too busy/forgetting, travels, depression, drug adverse effects. Treatment fitting to daily routine, relationship with health care providers, patients' perceptions of their doctors' capacities, perceived access to support from

their ART unit, and reliable pharmacies, keeping clinical appointments, using memory aids, and educational levels were associated with ART adherence (Tadios Y, Mengesha A ,2011).

Adherence is necessary to achieve full and durable viral suppression. Adherence is a complex feature influenced by numerous factors. Hence it is imperative to undertake an assessment study on the degree of adherence to ART and to identify factors associated with adherence to HIV positive patients who were on ART at Yergalem Health center, Southern Ethiopia

1.**2. Statement of the problem**

The rapid scale-up of ART is a key strategic priority for the Government of   Ethiopia and its partners. With the rapid scale-up of access to testing and treatment for an increasing number of Ethiopians with HIV/AIDS, an urgent need has arisen to ensure that clients are supported to adhere to recommended care and treatment. Clients are required to maintain more than 95% adherence, yet because of lack of support and various other reasons, an alarming number of clients has been dropping out of treatment: they are now considered lost to follow-up. Poor adherence is likely to lead to the progression and severity of AIDS, resulting in the development of a virus that is resistant to medications and poor health outcomes. Hence, the national "Road Map" recognizes that adherence to treatment will be critical to success, and ART must be provided with coordinated services to ensure a comprehensive continuum of care. (FHPCO, FMOH, 2009)

Patient adherence to antiretroviral (ART) combination therapy is a critical component to successful treatment outcome because HIV is highly mutable and requires lifelong treatment. Non adherence is a global problem and has been seen in all diseases. (WHO, 2016) Patient adherence to ARV combination therapy is a critical component to successful treatment outcome. While combination therapy is known to be effective in slowing disease progression, the long term benefit of these

therapies can only be sustained if resistant strains of HIV do not emerge among conditions that can result in the emergence of resistance. (Muluneh, 2011)

Multiple factors related to health care delivery systems, the medication and the person taking ARV drugs may affect adherence to ART. (FMOH, 2014).Therefore understanding the degree of adherence and its barriers would support the Government, people receiving ART and others to design feasible intervention methods to enhance adherence.

According to the observation made on the area of HIV/AIDS care and treatment program of the study area, the clients who have attended ART face challenges of adherence for diverse reasons. A barrier for adherence varies from client to client. This study will try to investigate this situation to fill up the gap based on the findings.

1.3 Research Questions of the Study

- ✓ What is the level of Knowledge of adherence among PLHA attending in Yergalem ART clinic?

- ✓ To what extent do patients adhere to ART?

- ✓ Are there association between the socio-demographic characteristics of patients and their level of adherence to ART at the Health center?

- ✓ What looks like patient relationship with the health care provider?

- ✓ What is the contribution of convenient health care system and clinical setting for ART Adherence?

1.4. Objectives of the study

1.4.1 General objective

✓ To assess the magnitude of adherence to antiretroviral therapy (ART) and associated factors among PLWH attending ART clinic at Yergalem Health center in Yergalem town, southern, Ethiopia.

1.4.2 Specific Objectives

✓ To assess the magnitude of ART adherence among people living with HIV/AIDS at Yergalem Health center Yirgalem, southern, Ethiopia.

✓ To assess the level of knowledge of ART adherence.

✓ To identify the socio demographic factors associated with ART adherence.

✓ To examine the patients' relationship with the health care providers at the clinic.

✓ To identify the contribution of health care system and clinical setting for ART adherence.

1.5. Significance of the study

Ethiopia has been able to scale up ART in spite of the limited resources available in the country. This has been possible due to different initiatives including the public health approach, health systems strengthening, community mobilization and provision of care and support services. While ART was being scaled up in Ethiopia, retention in care was later recognized as a real challenge for the program. The program has thus tried to identify and implement interventions to improve retention in care. A number of initiatives, including case management program, catchment area meetings, patient information systems, provision of care and support services, decentralization and task shifting, and framework for linkage to care, were designed and implemented to improve retention in care. (FMOH, 2014)

As a result of the rapid expansion of antiretroviral therapy (ART) programs in Ethiopia, the number of people living with HIV (PLHIV) enrolled in ART programs has increased dramatically, with overall ART coverage approaching 80%. Yet, poor adherence— characterized by attrition from HIV care, or becoming lost to follow-up remains a significant challenge to the success of the national ART program. Poor adherence is known to negatively influence the success of HIV treatment, increasing the likelihood that more drug-resistant strains of HIV will emerge. (I-Tech, 2014)

In the case of HIV, most PLHIV end up requiring lifelong ART in order to successfully reduce viral replication, thereby reducing AIDS-related morbidity and mortality. Nonetheless, ensuring maximum adherence and retention is a major hurdle to overcome in the management of HIV. Today, clinicians, HIV-positive clients, and affected families continuously struggle to maximize adherence to lifelong treatment

In addition, the already available initiatives on improving ART adherence and retention to care, up to date researches to determine the level of adherence and factor associated to adherence like this one is mandatory. That study has significance in building knowledge to explain the relationship of different factors associated with ART adherence that may hinder or facilitate adherence to ART. Also, it gives insight where to act to have a better treatment outcome.

The rationale for assessing this problem area is due to the fact that identification of determinant factors affecting ART amongst the adult people receiving ARV at health facilities is so significant to prevent resistance which could occur due to Non-adherence and to improve the qualities of life of HIV/AIDS patients.

1.6. Scope and Limitation of the study

strengths of this study was the use of multiple data sources including focus group discussions and semi-structured interviews, involving patients on ART, ART nurses, and case managers. Almost all participants accepted our offer and were involved in the study; the non-response rate was very low.

The limitation of study was, the study conducted only in one health center because of shortage of time, money and other related resource. Further study should be recommended at large scale in other Health centers and Hospitals providing ART (anti-retroviral therapy). .

1.7. Operational Definition of Key Terms

Adherence –is the ability to comply with medication prescribed and dispensed

ART adherence –is the ability to comply with ART medication prescribed and dispensed in the clinic for 95% of time or more**.**

Assessment –is the process of verifying and documenting how ART medication dispensed from the clinic or the previous visit were consumed.

Health care providers- are people who offer service to sick people in the health facility.

Prophylaxis- is a treatment which is given to patients in order to prevent disease from occurrence or reoccurrence.

Linkage to care –refers to the period starting with HIV diagnosis ending with initial enrollment in HIV care and Treatment.

Adherence to treatment-refers to the ability of the patients to develop and follow a plan of behavioral and attitudinal change that ultimately serves to empower him/her improve health and self-manage a given illness.

Personal operation definition –Adherence is the ability to comply with ART medication prescribed in the clinic for 95% of time.(FMOH 2014)

1.8Organization of the Study

The organization of this study is divided into chapters. This study has been organized into five chapters and a number of subtitles within each chapter. Chapter one of the studies is titled as introduction with sub title, background of the study, statement of the problem, research questions, and objectives of the study, significance of the study and organization of the study.

The second Chapter of this study is Literature Review. Under this part of the study there are many subdivisions like review of ART adherence in developed and developing country, factors associated with ART adherence, strategies and priority preventions.

Research Design and Methodology was organized under chapter three of the study. The chapter focuses on description of the study area, study design, universe of the study, (population source) , sampling, sample size and methods, data collection tools, procedure and data analysis as well AS Inclusion and exclusion criteria for participants.

The interpretation and discussion part of this study was placed under chapter four of the study with different socio demographic and economic characteristics of respondents, factors influencing ART Adherence among ARV users. Chapter five of the study deals with conclusions and recommendations of the study. The literatures reviewed in the study were used to present the conclusions and recommendations based on fact and evidence.

CHAPTER TWO

2. Literature Review

2.1 Review of Level of ART Adherence in Developed and Developing Countries

Despite the critical need for strong adherence to HIV treatment, research indicates, lack of adherence to ART is a major challenge to AIDS care. Adherence is taking the correct dose of medications, on schedule, and following dietary instructions. Poor adherence is linked to the development of drug resistance, higher mortality rates, lower rates of increase in CD4 cell count, lower rates of undetectable viral load, lower therapeutic success and increased hospital days (WHO, 2016).

The study conducted in Atlanta Georgia reveled that, twenty percent of the participants missed at least one dose of ARV. Another study in Madrid, Spain also shows greater than 90% adherence was recorded in only 57.6% of cases (Gordillo V, del Amo J, 1999). A study conducted on African and afro-Caribbean ART users revealed adherence greater than or equal to 95% reported by 60% of patients .Adherence was poor in 20%, fair in 30%, and excellent in 50% of study subjects (Stutterheim SE, Shiripinda I, Bos AE, Pryor JB, de Bruin M,2011)). A study in India showed the cumulative incidence of non-adherence to be 27.7% (Patel S, Baxi RK, Patel SN, Golin CE, Mehta M, 2012).

Adherence among patients in Soweto, South Africa was 80% (Peltzer K, Ramlagan S 2011). In Cape Town; 63% of patients maintained adherence levels of 90%. The picture for children was not so optimistic. The study reported that only 55% to 60% of African children were adherent to ART. But 95 percent adherence on ART drug is expected from children to get maximum benefit of ART.

In Ethiopia different studies conducted to assess the level of Adherence and factors associated to in health centers and Hospitals of different regions and City administrations. On the study conducted in Gobba Hospital, two hundred seventeen (90.8%) were adherent to the prescribed dose of ART drugs over the past seven days prior to the interview. Twenty-two (9.2%) of the participants missed the dose. (BikilaLencha, 2015). The other study conducted in public health facilities in Harar and Dire Dawa, Eastern Ethiopia, the level of dose adherence was 85 %; whereas, the rest 15 % missed doses (one and more) of their drugs in the last seven days (non-adherent).(Negesa L, Demeke E, MekonninW 2015) .In SNNPR Yergalem Hospital ,on the survey conducted on 241 patients the Prevalence of adherence in the week before interview was 74.2%,while 95% of adherence on ART drug is expected to benefit best of ART (Endrias .M, 2008).

In relation to retention to care in Ethiopia, by the end of June 2013 the number of people ever enrolled in chronic care reached 728,874 while the number ever started ART was 439,301 and 317,443 were currently receiving ART (SNNPR, RHB 2016)

Only 70.3% of individuals who ever started ART were currently on treatment indicating challenges in patients' retention. Patient loss to follow-up and ensuring adherence to ART regimens remain major challenges of the ART program across the regions (FHAPCO, 2014).

2.2 Factors Associated with ART Adherence

Adherence to treatment is inherently difficult, even in the best of circumstances. Both providers and clients must recognize that adherence is difficult, and requires a lot of effort. However, studies have identified determining factors that are relatively easy to change.

2.2.1. Client factors: Individual client factors that may hinder adherence include socio-demographic factors (e.g., age, gender, income, education, and literacy), behavioral and psychosocial factors (e.g., mental health, substance use), knowledge about HIV, attitudes towards lifelong treatment, and levels of family or social support (Dahab M, Charalambous S, 2011).

The study conducted in Kenya found that adherence to ART increased with increased age and decrease as the age goes beyond 60 years. (Anthony N, 2011)Study in Wolayita Soddo Hospital revealed Among female respondents 85% adhered to ART while among the male respondents 90.18% adhered to treatment by direct interview indicating that there is slight difference in ART adherence with higher rate in males. This may be because females have burden of routine daily household activities which contributed to forgetting (Alagaw A, Godana W, Taha M, Dejene T, 2013).Also study conducted in public health facilities in Harar and Dire Dawa, Eastern Ethiopia, the level of adherence was significantly influenced by age that patients in age group of 35–44 years old were more likely to be adherent than the younger and older. The possible explanation of this might be the younger might fear sigma and discrimination compared with middle aged adults. On the other hand, when they are getting older, the cognitive challenges can exist so that it decreases the adherence to the treatment. In the same study patients who had an average income of 501–999.00 ETB were more likely adhered than those earned less average monthly income (<500.00 ETB). (Negesa L, Demeke E, MekonninW 2015)

The other significant client related factor were family support and disclosure, five(5) studies conducted in resource limited setting of Rwanda ,southwest of Ethiopian ,Dessie and Addis Ababa reveled that Patients who got family support were more likely adhered than the counterparts Most of the time, the support start from accepting HIV result that would result in disclosing their status possibly received support from their family and friends which have immediate and long term

positive influences on their adherence. When there is no self- disclosure, the persons may fear to take their treatments when other people present. In such case there is a need to develop skill to maintain adherence in the non-disclosure state or design a way to encourage for disclosure. (Rachel Jean BR,2014&Amberbir A, Woldemichael K 2008 & Tiyou A, Belachew T ,2010).

2.2.2.Treatment factors: Treatment factors affecting adherence include the number of drugs being taken, complexity of drug regimens (dosing frequency and food instructions), the specific types of antiretroviral drugs being taken, drug toxicity, and interactions with drugs being used to treat concurrent illnesses. Evidences demonstrated that poor adherence to ART is a strong predictor of progression of disease to advanced AIDS stages.

Those patients taking less pill burden were more likely adherent. This might be associated with when a number of pill increases, it may subject them to experience more adverse effects from the medications which potentially lead them to skip their treatment. (Gifford AL, Bormann JE, 2000)

2.2.3. Health care provider factors: The client-provider relationship is another determinant of adherence. This comprises clients' overall satisfaction with the care provided, trust in the competence of providers, the willingness of providers to engage clients in the process of making decisions about their own care, and the concordance of socio-cultural values between clients and providers (Flickinger TE, Saha S, 2012).

Findings in Ethiopia also revealed PLWHA were more likely to adhere to ART if they follow clinical appointments regularly, had no history of drug abuse, feel comfortable of taking medication in front of others and had trust relationship with their clinician (Bikila Lencha 2015).

2.2.4. Health system factors: Aspects of health care that may affect adherence and retention include accessibility and friendliness of service at health facilities, availability of adherence support programs, distance of facilities from the home, availability of transportation, convenience of scheduled appointments, perceived confidentiality of private information, and overall satisfaction with previous experiences at the same facilities (Thompson MA, Mugavero MJ, 2012)

In the study conducted in Yergalem Hospital distance of residence, was significantly associated with adherence. Distance may have an effect on the timing of appointments for patients. Patients from far away may not have frequent and regular follow up, probably due to transport and time costs. Lack of frequent follow up may lead to obtaining less information about adherence. This suggests that patients would benefit if ART services were available in more institutions located closer to beneficiaries' homes. Social support may enhance adherence through encouragement, reassurance, reinforcement, systematic cues, bolstering of competence, and motivation, or by masking the effect of stress, anxiety, and depression (Endrias .M,2008).

The study conducted in wolayita Soddo revealed that, Patients who reported to have adherence support were 3.634 times more likely to be adherent than those who do not have adherence supporter (Alagaw A, Godana W, Taha M, Dejene T, 2013).

It is worth noting that lack of continuity of health care, whether due to insufficient laboratory supplies or depleted stocks of antiretroviral drugs, can also contribute to dissatisfaction among clients seeking HIV care.

2.3. ART Clinic of Yergalem Health Center

The ART clinic of Yergalem Health center has been providing ART service to all patients who are found to be HIV positive in the Health center as well as clients referred from the other health

facilities. Since the lunching of the ART service around 287 patients have been enrolled in ART clinic and 167 number of clients started ART. From this 101 are currently on ART. Due to different reasons retention to care is also the problem of Yergalem health center.

2.4. Strength of the ART Clinic

The clinic has registered best practices in treatment of HIV/AIDS clients with respect and with complete consideration for human right, ethics, informed consent, autonomy, and dignity. This means that they are practicing the value and principles of social work in their daily routine activity. That is increasing the effectiveness of service through on job education, mentorship and consultation with professionals within the system. Staffs always try to improve the quality of service, knowledge and skills, as the result ART the service is provided by well-trained qualified staffs.

The clinic has also adherence/case management program, focuses on strengthening Adherence and retention to care through provision of counseling on different topics including ART adherence and readiness assessment for clients both on PRE-ART and on ART. The staff members are known HIV positives on ART with Good Adherence. Their support is significant in the area of ensuring family focused care.

Referral as comprehensive care and support, no one person or organization can provide clients and their families all HIV care and support service they need. That is why it is important to have strong referral system in place. The ART clinic staffs are aware of the available community resources/organizations to refer clients based on their need. Detailed information on the available services outside the clinic is posted on the wall of ART clinic. To ensure service utilization the staffs archive the fed back from support organization. I found this activity as very relevant in the

provision of holistic service. To mention some, through referral the clients get a chance to participate in income generating activity (IGA)and to be part of PLWHA association.

The clinic has monitoring and evaluation of weekly, monthly and quarterly reporting purposes. Data quality is checked and evaluated to ensure that services provided were consistent with the standard operating procedures and as per the annual plan.

2.5. Constraints of the ART clinic

Currently the ART chronic care service is provided in single room privacy and confidentiality may not be kept the data clerk, ART clinician, Pharmacy dispensary is found in a single room. This may hinder the service quality as patients may not discuss all their concerns and illness like sexually transmitted disease in front of other staffs. For physical examination the clinician is forced to move to other outpatient department to examine the patient. This in turn hinders service quality and it can also be a barrier for Good Adherence and retention to care. The renovation of the ART clinic has been approved by SNNPR regional health bureau under the support of CDC Ethiopia. The construction will start soon.

Shortage of supplies like supplementary food due to the phase out of" Food by prescription "FBP program is also major challenge to provide comprehensive care in the health center as few clients have sever-malnutrition. The health center management   planned to arrange supply from the town administration health office.

The other challenge is that difficulty tracing of lost to follow up patients. Non -functional telephone line due to financial problem makes the tracing more difficult.

2.6. Strategies and Priority Intervention

The strategies to improve adherence and retention of patients and follow medication and care for chronic disease look HIV focus on the following major areas that need interventions to address the

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barriers related to the client the service provider, the health system and related environment. Under each strategy, there are major institutions which have been implemented and achieved good results in resource limited environment like Ethiopia. The strategies are:

-**Client empowerment** means empowering patients with the necessary knowledge and skills and providing support that make them adhere to the following a medications schedule with agreed recommendations from a health provider. The following are workable interventions that can bring about empowerment of patients.

-**Education and counseling services** are among the most effective behavioral intervention targeting ART adherence and retention in care.

-Client specific adherence related tools, including reminder devices. Colanders, pill box, dose planners and reminder alarm devices may be giving to patients taking ART to support their adherence.

-**Psychosocial and economic empowerment**, refer to psychological support spiritual advice, mental health, psychological shelter and nutrition support.

Despite the constraints that the ART clinic is facing, many improvements has been achieved through counseling, client education. Clients are empowered for their own health as the result early screening of family members, significant reduction in morbidity and mortality have been achieved. But still there are ART clients who couldn't achieve adherence greater than 95% also retention to care is still challenge.

CHAPTER THREE

3. DESIGN AND METHODOLOGY OF THE STUDY

3.1. Description of the study Area

This study was conducted at ART clinic of Yergalem Health center, the required data were collected from June - September 2017 in Yirgalem, southern, Ethiopia. Yirgalem town is found 317 Km South of Addis Ababa and 40 kilometers south of Hawasa in the Sidama Zone of the Southern Nations, Nationalities, and Peoples Region . The town has a latitude and longitude of 6°45′N 38°25′E and an elevation of 1776 meters. It is the largest settlement in Dale woreda. The catchment population of Yergalem Health center is 43,618of whom 21,840 are men and 21,975 women.

The town is Administration and Commerce center. The major investment opportunity in the town is coffee trade. Yergalem has economic linkages with the surrounding areas, towns, region and Addis Ababa. The town gets livestock supply, natural resources (fuel wood, charcoal) and labor from surrounding areas while grain products came from Oromia region. Agricultural inputs, construction materials, manufacturing and commercial products supplied to the town from Addis Ababa and Adama.

Regarding infrastructure, the town has asphalt and gravel roads connecting it to different woreda, zone, region and Addis Ababa .In addition to these; the town gets 24 hours electric supply from the national grid, and has mobile and fixed telephone lines, has internet services, and a postal service. The main water supply source potable water is river and water is distributed through piped network and 45 public water distribution points.

As stated above Yergalem Town being city administration and commerce center especially for coffee trade with high follow of heavy truck from Addis Ababa to Kenya, availability of Hawassa university Awada campus, increasing number of youth migration from rural to urban to look for job, road construction (coble stone), opening of many small coffee, Chat and Sisha houses makes the town more vulnerable to sexually transmitted infections (STI) .As the result Yergalem Town is one of the priority town selected by SNNPR RHB to intervene on HIV/AIDS prevention ,care and treatment .SNNPR RHB also lunched the catch up campaign to achieve 2020 goal set by UNAIDS in Yergalem Town.

Local NGOs like Beza for Generation, Good Neighbors Ethiopia and also international NGOs like ICAP-E from the donation of CDC under SNNPR RHB is supporting the prevention, care and Treatment of HIV/AIDS. In addition free cervical CA screening, Seed money for IGA and snacks for children's and families of PLWHIV are some provisions delivered by the NGOs.

3.2 Study Design

The study was employed both qualitative and quantitative methods to measure the magnitude of adherence to antiretroviral therapy (ART) and associated factors among PLWH attending ART clinic at Yergalem Health center in Yergalem town, southern Ethiopia**.**

3.3 Universe of the Study.

The universe of the study is all Adult people living with HIV/AIDS who are eligible for highly activated antiretroviral therapy (HAART) and being treated in ART of Yergalem health center, Yergalem, Southern Ethiopia. There are a total of 101 clients currently being taking ART at Yergalem HC. The inclusion criteria for selection of the participants include, taking the fixed dose multiple combined ART to single drug; more than 18 years of age; give verbal informal consent

voluntarily; admitted to the study Health center for ART and of take the drug as outpatient; able to give consent voluntarily. The exclusion criteria were also included all contacted ART clients who are unable to fulfill the ART inclusion criteria.

3.4 Sampling and sample size

The researcher selected sample of the study in a representative and adequate manner. From the total of 101 ART clients currently taking ART at Yergalem HC ART clinic, the sample size was determined using sampling formula. Then sample size determination formula was applied for 101ART clients currently taking ART at Yergalem HC ART clinic by simple size determination formula that is developed by (Yemane.Taro, 1967). After determining the sample size simple random sampling technique was done to select the representative samples from the population.

$n = N/(1 + N(e)2)$

Where n is the sample size

N is the population size and

e is the acceptable sample error = (5%)

n= 101/ 1+101 (0.05) 2= 81sample participants

3.5. Sampling Selection Procedures

All Adult PLWHA taking ART in Yergalem Health center constituted source population whereas all PLWHA getting antiretroviral treatment services within the study period represented study population. Since all ART clients come to the clinic every 28 days for refill, the study covered all consecutive patients who attend ART clinic for refill over four weeks' study period and hence, convince sampling technique was used. As to   the inclusion criteria study participants that were age

>18 years of age, Taking the fixed dose multiple combined ART to single drug, admitted to the study Health center for ART at least for three months and of take the drug as outpatient and Able to give consent voluntarily. For the qualitative study (FGD) Peer educator was communicated to recruit 12 volunteer ARV users and all volunteer peer educators participated and also in-depth interview schedule was conducted with two health worker's /ART providers.

3.6. Data collection tools of the Study

3.6.1: Interview schedule for participants: Every patient who comes for ART service during the data collection time was interviewed by trained enumerators. Volunteer patients was interviewed for the following variables socio -demography, Health and Illness, Knowledge, attitude to the regimen, relation with health care professionals, HIV/AIDS related disease occurrence while taking ART and opinion of the health delivery system.

3.6.2. Interview Guide for the health care worker: Interviews was conducted with the officials (1 ART HO and one ART nurses) from Yergalem Health center ART clinic who was on provision of ART service at the time of data collection.

The questionnaire was Pre-Tested on selected participants of the same sample population of ten (10) clients using a treatment of HAART at Yergalem Hospital out of the study facility.

A cross-sectional study was conducted to collect data for assessment of adherence. The adherence rate of the past one week prior to the data collection period was calculated by considering number of doses taken by the number of doses prescribed multiplied by 100%.

3.6.3: **FGD Guide**: In addition to interview schedule   questionnaire and interview guide questions FGD guide questions were prepared for focused group discussion. Peer educator was communicated to recruit 12 volunteer ARV users and volunteer peer educator and case manager were participated

3.6.4:Document Analysis: relevant documents review such as ART follow up chart was conducted to assess the level of medication Adherence, current functional status, and weight and most recent that staging from the ART follow up chart.

3.7: Data Quality Control and Assurance

Items concerning information on the questionnaire was completed by interviewer and was related to the respondents answer. The questionnaire was translated to Amharic Language then back to English to ensure the consistency of the questionnaire. The questionnaire was Pre-Tested on a sample population of ten (10) clients using a treatment of highly activated anti-retroviral therapy (HAART) at Yergalem Health center in order to make all the data collectors understand each question in a similar way and collect the intended information plus to finish out questionnaires need to be amended. Two registered nurses who are working at ART unite was trained for one day before they engaged to any activities. The interview was conducted in a place where the interviewee feels free and alone with the respondents. The respondent right not to participate in the study was respected for those who are found to be refused .In the same manner one supervisor was selected (ART clinician)and give a highlight/train about the study to ensure the completeness and quality of information during data collection. There was a spot checking of the data collectors to give timely correction at mark. The filled questionnaire was reviewed by the supervisor and the principal investigator at daily base after through checkup to manage problems encountered.

With regard to in-depth interview Ten study subjects with homogenous background be considered and the study subject was limited during data analysis process by checking respondents' information and saturation of ideas produced from the interviews.

At the time of processing data was entered to the computer and 10 percent of the data entered was checked for consistency .The quality of data was assured through translating the English questionnaire into Amharic then back to English discrepancies was corrected before data collection. Data collection was carried out by trained nurses who were selected from the catchment health facilities. Ten percent of the collected data was check by the supervisor daily for completeness and finally the principal investigator monitored the overall quality of data collection.

3.8. Data Interpretation and Analysis

The information collected from the respondents were sorted, coded and entered into data sheet created in statistical package for social science (SPSS) version 20.Double data entry system was used to minimize errors in data entry ,Difference between adherence and non-adherence subjects was tested using chi-Square test for continuous and categorical explanatory variables ,respectively .The strength of association between explanatory variables and adherence was measured using logistic regression and was reported as odds ratio (OR) with 95% confidence interval.

First the association was measured for each explanatory variable in univariate model. Then each univariate model was adjusted for age and sex, in the second step, Multivariate analysis was conducted including the entire variable in one model. In the last step, only variables with statistical or borderline significant association in the multivariate model (including all variable) were included in the final model. The criteria for statistical significance will be p value <0.05

Data were summarized and presented using descriptive statistics. Bivariate and multiple logistic regressions were computed to identify the presence and strength of associations. Odds ratios with 95% CI were computed and variables having p-values less than 0.05 in the multiple logistic regression models were considered significantly associated with the dependent variable (adherence).

Variables of the study

Measures to conduct the study

Dependent variable

ART adherence among PLHA

Independent variables were:

Socio-demographic factors: Age, sex, marital status, level of education, religion, occupation and Monthly Income

Clinical factors: WHO clinical stage, current weight and functional status.

Knowledge about adherence: Time, source of the information, beliefs on ART, benefits of ART, importance of adherence, months on ART, Disclosure

Medication related: Need for daily administration, Length of treatment, pill burden, reminder use, taking ART in front of others.

Health care system and clinical setting: Distance from ART site, satisfaction on the schedule

Patient-provider relationship: satisfaction on service, confidentiality and availability of counseling services, health education/information and improvement the client

3.9 Ethical Considerations

The proposal was evaluated by IGNOU-SMU International Programs for the topic and methodology relevance. Ethical clearance was obtained from IGNOU- SMU and SNNPR health bureau. Before enrolling any of the eligible study participants, the purpose and the benefits and the confidential nature of the study was described and discussed for each participant. Their oral informed consent was secured. The discussions between the data collectors and the respondents were takes place privately and individually. Only those consented and proved their willingness to take part in the study was enrolled and interviewed.

A focus group discussion was conducted in Yergalem HC meeting Hall. Focus group participants were required to maintain the confidentiality of the identities of other participants and the content of the discussion.

To keep confidentiality, the information collected from this research project was kept confidential and information from the participant was collected by this study was stored in the file, without participant's name. In addition, it was not revealed to anyone except the investigator and all responses given by participants was kept confidential by using key and locked system like computer pass word whereby no one have an access to see it.

4. DATA INTERPRETATION AND ANALYSIS

Data was described and prevalence of adherence was measured first then simple logistic regressions analysis followed by binary multiple logistic regression analysis were used to assess adherence to antiretroviral therapy and associated factors among adult people living with HIV/AIDS in Yirgalem health center. The dependent variable of this study is adherence level to antiretroviral therapy among people living with HIV. The independent variables used to predict the outcome of this study were divided into six groups. They include socio-demographic factors (sex, age, ethnic groups, marital status, religion, education status, employment status and monthly income); factors related to knowledge about adherence, factors related to Patient/Adherence supporters/care givers relationship, factors related to Health care system and clinical setting, patients self-report about adherence assessment and patients' current physical status.

4.1. Socio demographic and Economic characteristics of respondents

Table 4.1: Socio-demographic and economic characteristics of the respondent attending ART in HC in Yirgalem town southern Ethiopia ,August 2017

Demographic characteristics		Count	Column (N %)	Demographic characteristics		Count	Column (N %)
Sex of the	Male	22	28%		Gurage	7	9%
respondent	Female	58	72%		Sidama	35	44%
Ethnic group	Amhara	18	22%		Other	5	6%
of the	Oromo	11	14%	Marital	Unmarried	9	11%
respondents	Tigrie	4	5%	Status of the	Married	49	61%

Demographic characteristics		Count	Column (N %)	Demographic characteristics		Count	Column (N %)
Respondent	Divorced	12	15%		Unemployed	13	16%
	Separated	1	1%		Daily laborer	8	10%
	Widowed	9	11%		Student	1	1%
	Orthodox	43	54%		Other	20	25%
Religion of	Catholic	5	6%		No income	36	45%
the	Protestant	28	35%		200-250	26	32%
Respondent	Muslim	3	4%	Monthly	251-500	7	9%
	Others	1	1%	income of the	501-1000	7	9%
	Illiterate	16	20%	respondent	1001-2000	1	1%
Educational	Read&write	2	2%		2001-3000	0	0%
Status of the	Elementary	38	48%		Above 3000	3	4%
Respondent	Highschool	18	22%		18-24	4	5%
	Above school	6	8%		25-31	33	41%
Occupational	Government employee	11	14%	Age range of the	32-38	28	35%
Status of the					39-45	10	12%
Respondent	House wife	22	28%	respondents	46-52	2	2%
	Farmer	5	6%		53and above	3	4%

Source: Own Survey, 2017

The above table 4.1 shows that the study was conducted on 80 patients giving the response rate of 100%. More than half (54%)of the study participants were above 31 years, while 41% were between 25-31 years of age. Most of the total participants (72%) were female.

Concerning their ethnicity most of the respondents 35 (44%) were Sidama followed by Amhara 18 (22%) and Oromo 11 (14%). Regarding their religion 43 (54%) was Orthodox followed by Protestant28 (35%). Referring their educational status 56 (70%) of the participants have learnt below 8 grades while 16 (20%) were not able to read and write. Relating their occupational status house wives accounted 28% followed by others 25%, unemployed 16%, government employee 14% and daily laborers 10% of the total respondents.

Their current marital status indicated that of the total respondents 61% (49) were married, 15%divorced, 11% widowed and 11% single. Most of the participants 77% (62) could earn monthly income of not more than 250 ETB while 45% (36) could earn no formal monthly income at all.

4.2. Results of univariate analysis

4.2.1. Adherent levels between Socio-demographic and economic characteristics of the population living with HIV/AIDS attending ART in HC in Yirgalem town (n=80)

Bivariate analyses were conducted to evaluate medical adherent status between Socio-demographic and economic characteristics of the population living with HIV/AIDS attending ART in HC in Yirgalem town (n=80).

(Table 3). Overall 71 (89%) of people living with HIV/AIDS, reported being adherent while 9 (11%) reporting of being non-adherent.

Sex

Of the total participants 73% were female while only 27% were male. Among total women 50 (86%) reported as adherent. A further analysis of the respondents' gender in terms of adherence to ART showed that among female respondents 50 (86%) adhered to ART while

among the male respondents 21 (95%) adhered to treatment. It indicated that more males adhered to ART than females. However, the statistical analysis using the Chi-square test of independence showed that there was no a significant relationship between the gender of respondents and adherence to ART ($\chi2$ =1.366, df = 1, p=0.242 > 0.05)

Age group

More than half (54%) of the study participants were above 31 years, while 41% were between 25-31 years of age. The respondents' ages ranged from 20 to 60 while the biggest age group was between 32 and 38 years old. Most of the respondents were in the reproductive age group of between 20 to 49 years. Respondents in the age group older than 52 years were only 7%. This finding indicated that the majority of patients in Yirgalem health clinic who participated in the study were in the age group of between 25 and 45 years (89%) and they were more aware of their status and were undergoing ART.

However, the results indicated that the age of respondents did not influence ART adherence ($\chi2$ = 3.17, with df = 5 and p = 0.674>0.05). Adherence to treatment according to findings of this study was similar between younger and older respondents.
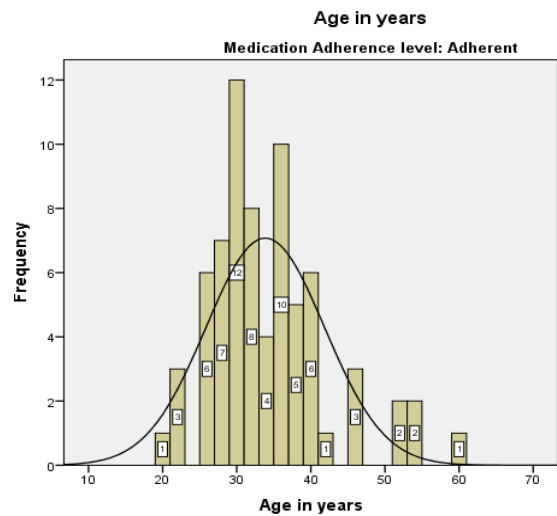
Marital status

Among the respondents, the majority were married (61.25%), followed by divorced ones (15%) unmarried (11.25%), widowed (11.25%) and separated (1.25%). The results suggest

that married people were the largest category who knew their HIV status and who were taking ARV treatment. However, the chi-square statistic revealed no significant association between marital status of respondents and adherence to ARV treatment ($\chi2 = 1.368$ with df =2, p= 0.850 > (0.05).

Employment status

The percentage of unemployed respondents was 61% that was very high in comparison with those employed in government organizations (14%) and others not identified their status (25%). However, statically there was no significant association between occupation of respondents and ART adherence ($\chi2 = 4.0499$ with df =1 p= 0.670). This could be a result of easily accessible and free provision of ART by the public health sector.

Educational status

The majority of the respondents completed secondary school (66.9%), followed by those who had primary school education (20.3%), 7.9 % had tertiary education, and the least were of them (4.8%) had no formal education. A more thorough analysis of adherence status indicated that as education level increases, adherence levels also increases. The adherence level of those at tertiary level was 87%, followed by secondary education (75.3%), and the least was noted as the ones without any formal education (64.3%). No significant association was noted between the level of education and adherence to ARV treatment ($\chi2 = 3.52$; df = 3, p = 0.032).

Monthly income of the respondent

With regard to monthly income, 40(51%) of the participants have a monthly income of between 250-500 ETB, followed by 36 (45%) who claimed to have no formal monthly income and only 4(5%) have 1000 and above. However, only 45% (36) could earn no formal monthly income at all. No significant association was noted between the level of monthly income and adherence level to ARV treatment ($\chi 2 = 4.079$; df = 6, p = 0.538)

Monthly income of the respondent
Medication Adherence level: Adherent
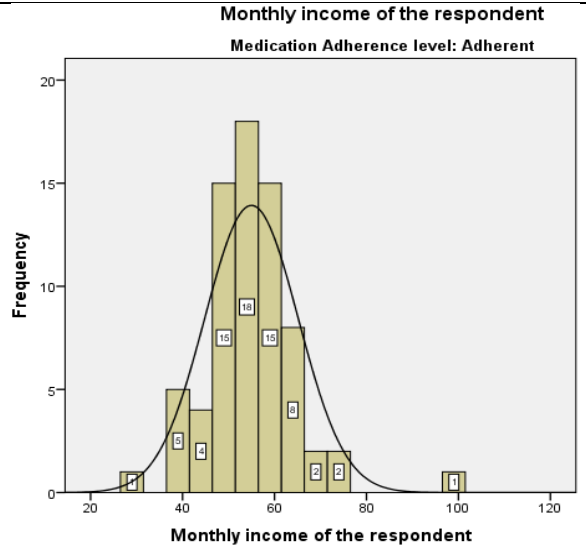
Table 4.2: Socio-demographic characteristics of the patients according with their medication adherence status in Yergalem Health center southern Ethiopia, August2017

Socio-demographic and economic characteristics		Medication Adherence level						Univariate analysis	
		Non- adherent		Adherent		Total		Chi-square	Sig.
		Freq.	%	Freq.	%	Freq.	%		
Sex of the respondent	Male	1	11%	21	30%	22	28%	1.366	.242
	Female	8	89%	50	70%	58	73%		
	Total	9	100%	71	100%	80	100%		
Age range of the respondents	18-24	0	0%	4	6%	4	5%	3.17	.674
	25-31	5	56%	28	39%	33	41%		
	32-38	4	44%	24	34%	28	35%		
	39-45	0	0%	10	14%	10	13%		
	46-52	0	0%	2	3%	2	3%		
	53 and above	0	0%	3	4%	3	4%		
	Total	9	100%	71	100%	80	100%		
Ethnic group of the respondents	Amhara	2	22%	16	23%	18	23%	7.18	.208
	Oromo	0	0%	11	15%	11	14%		
	Tigrie	1	11%	3	4%	4	5%		

Socio-demographic and economic characteristics		Medication Adherence level						Univariate analysis	
		Non- adherent		Adherent		Total			
		Freq.	%	Freq.	%	Freq.	%	Chi-square	Sig.
	Gurage	0	0%	7	10%	7	9%		
	Sidama	4	44%	31	44%	35	44%		
	Other	2	22%	3	4%	5	6%		
	Total	9	100%	71	100%	80	100%		
Marital Status of the Respondent	Unmarried	1	11%	8	11%	9	11%		
	Married	5	56%	44	62%	49	61%		
	Divorced	1	11%	11	15%	12	15%	1.368	.850
	Separated	0	0%	1	1%	1	1%		
	Widowed	2	22%	7	10%	9	11%		
	Total	9	100%	71	100%	80	100%		
Religion of the Respondent	Orthodox	4	44%	39	55%	43	54%		
	Catholic	1	11%	4	6%	5	6%		
	Protestant	3	33%	25	35%	28	35%	2.147	.709
	Muslim	1	11%	2	3%	3	4%		
	Others	0	0%	1	1%	1	1%		
	Total	9	100%	71	100%	80	100%		
Educational Status of the Respondent	Illiterate	2	22%	14	20%	16	20%		
	Read and write	0	0%	2	3%	2	3%		
	Elementary level	6	67%	32	45%	38	48%		
	Hig hschool level	1	11%	17	24%	18	23%	2.408	.661
	Above high school	0	0%	6	8%	6	8%		
	Total	9	100%	71	100%	80	100%		
Occupational Status of the Respondent	Goverment employee	0	0%	11	15%	11	14%		
	House wife	3	33%	19	27%	22	28%		
	Farmer	0	0%	5	7%	5	6%		
	Unemployed	2	22%	11	15%	13	16%	4.049	.670
	Daily laborer	2	22%	6	8%	8	10%		
	Student	0	0%	1	1%	1	1%		
	Other	2	22%	18	25%	20	25%		
	Total	9	100%	71	100%	80	100%		
Monthly income of the respondent	No income	5	56%	31	44%	36	45%		
	200-250	2	22%	24	34%	26	33%		
	251-500	2	22%	5	7%	7	9%	4.079	.538
	501-1000	0	0%	7	10%	7	9%		
	1001-2000	0	0%	1	1%	1	1%		
	2001-3000	0	0%	0	0%	0	0%		

Socio-demographic and economic characteristics		Medication Adherence level						Univariate analysis	
		Non- adherent		Adherent		Total		Chi-square	Sig.
		Freq.	%	Freq.	%	Freq.	%		
	Above 3000	0	0%	3	4%	3	4%		
	Total	9	100%	71	100%	80	100%		

Source: Own Survey, 2017

4.2.2. Results of univariate analysis to evaluate adherent levels between characteristics related to knowledge about adherence of the study population living with HIV/AIDS attending ART in HC in Yirgalem town (n=80)

Bivariate analyses were conducted to evaluate medical adherent levels between characteristics related to knowledge about adherence of the study population living with HIV/AIDS attending ART in HC in Yirgalem town.

Majority 51 (64%) of the people living with HIV/AIDS attending ART in HC in Yirgalem town have heard about ARV Before their illness while 21% have heard during the illness and only 15 % after. From this it can be concluded that most patients were aware of the ARV before they start the treatment. However, no significant association was observed between medication adherence status and knowledge related to the time during which the patients heard about ARV.

Asked from where they got the information 60% replied from mass media, followed by health professionals (39%). Similarly, no significant association was observed between medication adherence level and information sources.

Regarding the benefits of ARV all the study people 80(100%) were replied that they knew the benefits of ARV and all committed to start ART. However, most of the respondents replied that they did not know the importance of adherence before they start ART (74%).

In terms of the duration of the ART treatment, 64% were taking treatment for more than 36 months, 24% for 13-36 months, 10% in between 7-12 months and 10% took their medication for less than six months. However, the researcher noted that there was no significant association between the length of duration and adherence to ART.

The majority of the respondents disclosed their status (93%) to their family, friends and relatives. Asked 'When taking ART, an HIV infected person will be cured from AIDS?' 96% replied no. Also 100% of the respondents replied that if takes ART the person will live long and take pills for the rest of their life to delay the development of AIDS. Moreover, all patients knew that when one takes ART, it has to be taken at specific time. In contrast, 63% replied no for 'When one takes ART the daily dose should be respected not be skipped'. The majority (70%) of the respondents replied that they feel not comfortable when taking ART in front of others than before. Asked 'Do you know adherence supporters?' 34% replied 'no' and 35 % of didn't have the adherence counseling service from adherence supporters as well. Asked 'Are you satisfied by the improvement you obtain for your treatment?' half 40(50%) of the respondents replied yes, followed by 33(41%) no and 7(9%) not sure.

The majority of respondents (90%) had to travel less than 10km to collect their medication from a clinic. Only 9% was collecting their ART medication by travelling more than 20km. However, no association was observed between distance from the facility and ART adherence in this study

Table 4.3. Results of univariate analysis to evaluate adherent levels between characteristics related to knowledge about adherence of the study population living with HIV/AIDS attending ART in HC in Yergalem Health center Yergalem southern Ethiopia, August2017 (n=80)

		Non- adherent		Adherent		Total		Univariate Analysis	
		Freq.	%	Freq.	%	Freq.	%	Chi-square	Sig.
When did you hear about ARV?	Before my illiness	5	56%	46	65%	51	64%	2.87	.238a
	After my illiness	3	33%	9	13%	12	15%		
	During my illiness	1	11%	16	23%	17	21%		
	Total	9	100%	71	100%	80	100%		
From where did you get the information about ARV?	Health care professional	4	44%	27	38%	31	39%	0.245	.885a,b
	Mass Media	5	56%	43	61%	48	60%		
	Others specify	0	0%	1	1%	1	1%		
	Total	9	100%	71	100%	80	100%		
Do you think ART benefits you?	Yes	9	100%	71	100%	80	100%	.	.
	No	0	0%	0	0%	0	0%		
	Total	9	100%	71	100%	80	100%		
Are you committed/ convinced to start ART?	Yes	9	100%	71	100%	80	100%		
	No	0	0%	0	0%	0	0%		
	Total	9	100%	71	100%	80	100%		
After you have started ART, what benefit did you get?	Improved quality of life	1	11%	8	11%	9	11%	15.01	.132a,b
	Weight gain	1	11%	4	6%	5	6%		
	Reduced fever	1	11%	1	1%	2	3%		
	Reduction of hospitalization	0	0%	0	0%	0	0%		
	Reduced frequency of diahorrea	1	11%	4	6%	5	6%		
	No benefit at all	1	11%	2	3%	3	4%		
	Improved quality of life, weight gain and reduced fever	0	0%	17	24%	17	21%		
	Improved quality of life and reduced fever	0	0%	9	13%	9	11%		

		Non- adherent		Adherent		Total		Univariate Analysis	
		Freq.	%	Freq.	%	Freq.	%	Chi-square	Sig.
	Reduced fever and frequency of diahorrea	0	0%	1	1%	1	1%		
	Improved quality of life and weight gain	0	0%	15	21%	15	19%		
	improved quality of life reduced frequency of diahorrea	2	22%	4	6%	6	8%		
	gained all benefits mentioned above	2	22%	6	8%	8	10%		
	Total	9	100%	71	100%	80	100%		
Do you know the importance of adherence before you start ART?	Yes	2	22%	19	27%	21	26%		
	No	7	78%	52	73%	59	74%	0.085	.771a
	Total	9	100%	71	100%	80	100%		
How long have you been on ART?	1- 6 months	1	11%	3	4%	4	5%		
	7-12 months	0	0%	4	6%	4	5%		
	13-24 months	2	22%	9	13%	11	14%	8.973	.062a,b
	25-36 months	3	33%	5	7%	8	10%		
	> 36 months	3	33%	50	70%	53	66%		
	Total	9	100%	71	100%	80	100%		
Have you disclosed your HIV status to any one?	Yes	4	100%	65	92%	74	93%		
	No	5	0%	6	8%	6	8%	15.413	.000a,b
	Total	9	100%	71	100%	80	100%		
If yes to the above question to whom?	Wife	0	0%	6	9%	6	8%		
	Family and relatives	2	22%	10	15%	12	16%		
	Friends	1	11%	0	0%	1	1%		
	Others specify	0	0%	1	1%	1	1%		
	Wife, Family & relatives	0	0%	5	7%	5	7%		
	Wife and Friends	0	0%	2	3%	2	3%	10.883	.367a,b
	Family & relatives and Friends	1	11%	12	18%	13	17%		
	Wife, Family & relatives and Friends	0	0%	3	4%	3	4%		
	Others specify	0	0%	0	0%	0	0%		
	husband	1	11%	7	10%	8	11%		

		Non- adherent		Adherent		Total		Univariate Analysis	
		Freq.	%	Freq.	%	Freq.	%	Chi-square	Sig.
	Family, relatives and others	4	44%	20	30%	24	32%		
	Hasband, family and relatives	0	0%	0	0%	0	0%		
	Family, relatives, friend and husband	0	0%	1	1%	1	1%		
	Total	9	100%	67	100%	76	100%		
When taking ART, AIDS will be delayed?	Yes	9	100%	70	100%	79	100%		
	No	0	0%	0	0%	0	0%		
	Total	9	100%	70	100%	79	100%		
When taking ART, an HIV infected person will be cured from AIDS	Yes	9	100%	68	96%	77	96%	0.395	.530a,b
	No	0	0%	3	4%	3	4%		
	Total	9	100%	71	100%	80	100%		
When taking ART, it can happen that one may get sick from the RX itself?	Yes	1	11%	9	13%	10	13%	0.018	.894a
	No	8	89%	62	87%	70	88%		
	Total	9	100%	71	100%	80	100%		
When taking ART, do you think the person will live long?	Yes	9	100%	71	100%	80	100%		
	No	0	0%	0	0%	0	0%		
	Total	9	100%	71	100%	80	100%		
When one takes ART, it has to be taken at specific time?	Yes	8	89%	68	96%	76	95%	0.797	.372a,b
	No	1	11%	3	4%	4	5%		
	Total	9	100%	71	100%	80	100%		
When one takes ART the daily dose should be respected not be skipped?	Yes	5	56%	25	35%	30	38%	1.411	.235a
	No	4	44%	46	65%	50	63%		
	Total	9	100%	71	100%	80	100%		
You should take pills for the rest of your life to delay the development of AIDS?	Yes	9	100%	71	100%	80	100%		
	No	0	0%	0	0%	0	0%		
	Total	9	100%	71	100%	80	100%		
Are you taking fixed	Yes	9	100%	67	94%	76	95%	0.534	.465a,b
	No	0	0%	4	6%	4	5%		

		Non- adherent		Adherent		Total		Univariate Analysis	
		Freq.	%	Freq.	%	Freq.	%	Chi-square	Sig.
dose combined or single drugs?	Total	9	100%	71	100%	80	100%		
What do you suggest about a fixed dose combined or single drugs?	Reduced pill burden	0	0%	4	6%	4	5%	13.747	.089a,b
	Eay to remember	1	11%	8	11%	9	11%		
	Easy to take	1	11%	2	3%	3	4%		
	I do not know	0	0%	5	7%	5	6%		
	Reduced pill burden and easy to remember	0	0%	14	20%	14	18%		
	Reduced pill burden and easy to take	3	33%	3	4%	6	8%		
	Easy to take and remember	2	22%	21	30%	23	29%		
	Reduced pill burden, easy to remember and take	2	22%	13	18%	15	19%		
	14	0	0%	1	1%	1	1%		
	Total	9	100%	71	100%	80	100%		
Do you feel comfortable when taking ART in front of others than before?	Yes	4	44%	20	28%	24	30%	1.008	.315a
	No	5	56%	51	72%	56	70%		
	Not sure	0	0%	0	0%	0	0%		
	Total	9	100%	71	100%	80	100%		
Does the RX schedule fit the daily routine than the previous?	Yes	8	89%	65	92%	73	91%	3.648	.161a,b
	No	1	11%	1	1%	2	3%		
	Not sure	0	0%	5	7%	5	6%		
	Total	9	100%	71	100%	80	100%		

Source: Own Survey, 2017

4.2.3.**Results of univariate analysis to evaluate medical adherent levels between characteristics related to Patient/Adherence supporters/care givers relationship of the study population living with HIV/AIDS attending ART in HC in Yirgalem town (n=80)**

Univariate analysis was conducted to evaluate the association between medical adherent levels and characteristics related to Patient/Adherence supporters/care givers. Results disclose that 87% of the patients have different types (or combined) sources of schedules to use to remember to take their medication including Watch bell and Cell phone reminder which accounts 61% of the total. Most the of respondents (94%) said that they obtained education or assistance when they need help during their visit, had open communication with health care providers treating them (96%), and satisfied with the clinical service (98%) and 99% confidentiality of the treatment unit. However, 35% claimed that they were not provided adequate adherence counseling service, 36% didn't even know adherence supporters and 41% were not satisfied by the improvement they obtain for their treatment and 9% were not sure of the improvement. The finding showed that significant association existed between patients' satisfaction by the improvement they obtained for their treatment and adherence ($\chi2$ =7.721, df =1, p = 0.000 < 0.021).

Table 4.4: Association of characteristics related to Patient/Adherence supporters/care givers relationship and level of Adherence Yergalem Health center, Yergalem Southern Ethiopia ,August ,2017

| | | Medication Adherence level | | | | | | Univariate analysis | |
| | | Non- adherent | | Adherent | | Total | | | |
		Freq.	%	Freq.	%	Freq.	%	Chi-square	Sig.
What types of schedules do you use to remember to take your medication?	Pill box	0	0%	3	4%	3	4%	7.254	.002a,b
	Written reminder	0	0%	0	0%	0	0%		
	Watch bell	1	11%	18	25%	19	24%		
	Cell phone reminder	3	33%	20	28%	23	29%		
	Don't have	2	22%	8	11%	10	13%		
	TV	1	11%	1	1%	2	3%		
	Radio	0	0%	3	4%	3	4%		
	Pill box and cell phone reminder	1	11%	3	4%	4	5%		
	Pill box and watch bell	1	11%	6	8%	7	9%		
	Watch bell and cell phone reminder	0	0%	4	6%	4	5%		
	Pill box and written reminder	0	0%	1	1%	1	1%		
	12	0	0%	2	3%	2	3%		
	TV and cell phone reminder	0	0%	1	1%	1	1%		
	Written reminder and watch bell	0	0%	1	1%	1	1%		
	Watch bell and TV	0	0%	0	0%	0	0%		
	Total	9	100%	71	100%	80	100%		
Are you satisfied with the clinical service?	Yes	9	100%	69	97%	78	98%	0.26	.878a,b
	No	0	0%	1	1%	1	1%		
	Not sure	0	0%	1	1%	1	1%		
	Total	9	100%	71	100%	80	100%		
Do you have open communication with health care providers treating you?	Yes	9	100%	68	96%	77	96%	0.395	.821a,b
	No	0	0%	2	3%	2	3%		
	Not sure	0	0%	1	1%	1	1%		
	Total	9	100%	71	100%	80	100%		

		Medication Adherence level						Univariate analysis	
		Non- adherent		Adherent		Total			
		Freq.	%	Freq.	%	Freq.	%	Chi-square	Sig.
Do you obtain education or assistance when you need help during your visit?	Evey month	8	89%	67	94%	75	94%	0.91	.635a,b
	every two months	1	11%	3	4%	4	5%		
	every three months	0	0%	1	1%	1	1%		
	Total	9	100%	71	100%	80	100%		
Do you know adherence supporters?	Yes	4	44%	47	66%	51	64%	1.636	.201a
	No	5	56%	24	34%	29	36%		
	Total	9	100%	71	100%	80	100%		
Have you got adequate adherence counseling service from adherence supporters?	Yes	4	44%	48	68%	52	65%	1.883	.170a
	No	5	56%	23	32%	28	35%		
	Total	9	100%	71	100%	80	100%		
Are you satisfied by the improvement you obtain for your treatment?	Yes	3	33%	37	52%	40	50%	7.721	.021a,b,*
	No	3	33%	30	42%	33	41%		
	Not sure	3	33%	4	6%	7	9%		
	Total	9	100%	71	100%	80	100%		
Are you satisfied in the confidentiality of the treatment unit?	Yes	9	100%	70	99%	79	99%	0.128	.720a,b
	No	0	0%	0	0%	0	0%		
	Not sure	0	0%	1	1%	1	1%		
	Total	9	100%	71	100%	80	100%		

Source: Own Survey, 2017

4.2.4.Results of univariate analysis to evaluate medical adherent levels between characteristics related to Health care system and clinical setting of the study population living with HIV/AIDS attending ART in HC in Yirgalem town (n=80)

It was conducted Univariate analysis to evaluate the association between medical adherent levels and characteristics related to Health care system and clinical setting. The majority of respondents (90%) had to travel less than 10km to collect their medication from a clinic.

Only 9% was collecting their ART medication by travelling more than 20km. However, no association was observed between distance from the facility and ART adherence in this study. Asked 'Are you satisfied in the scheduling appointment of the treatment unit?' 70% replied yes, followed by no (28%) and not sure (2%). However, there was no significant association observed.

Table: Association of adherence level and characteristics related to Health care system and clinical setting of the study population living with HIV/AIDS attending ART in HC in Yirgalem town southern Ethiopia.

Table 4.5. Association of characteristics related to Health care system and clinical setting and level of adherence Yergalem Health center Yergalem Southern Ethiopia

| | | Medication Adherence level | | | | | | Univariate analysis | |
| | | Non- adherent | | Adherent | | Total | | | |
		Freq.	%	Freq.	%	Freq.	%	Chi-square	Sig.
How far is your residence from the ART unit you are attending	< 5 km	6	67%	58	82%	64	80%	2.468	.481a,b
	5-10 km	1	11%	7	10%	8	10%		
	11-20 km	0	0%	1	1%	1	1%		
	>20 km	2	22%	5	7%	7	9%		
	Total	9	100%	71	100%	80	100%		
What means of transportation do you use to visit ART clinic	On foot	5	56%	54	76%	59	74%	2.7	.440a,b
	Public transport	1	11%	7	10%	8	10%		
	Own vehicle	0	0%	0	0%	0	0%		
	Taxi	2	22%	8	11%	10	13%		
	Others specify	1	11%	2	3%	3	4%		
	Total	9	100%	71	100%	80	100%		
Are you satisfied in the scheduling appointment of the treatment unit?	Yes	6	67%	50	70%	56	70%	0.395	.821a,b
	No	3	33%	19	27%	22	28%		
	Not sure	0	0%	2	3%	2	3%		
	Total	9	100%	71	100%	80	100%		

Source: Own Survey, 2017

4.2.5. Results of univariate analysis to evaluate medical adherent levels between adherence and current (physical) status of patients.

Current functional status was tracked and all patients were obtained working. The results revealed that there was significant association between current weight of patients and ART adherence (Pearson Chi-Square = 11.963, with df =1 and p-value < 0 .035).

Table 4.6. Association of physical status of the ARV users and level of medication adherence Yergalem HC Yergalem Southern Ethiopia August 2017

		Medication Adherence level						Univariate analysis	
		Non-adherent		Adherent		Total			
		Freq.	%	Freq.	%	Freq.	%	Chi-square	Sig.
Current functional status	Working	9	100%	71	100%	80	100%		
	Ambulatory	0	0%	0	0%	0	0%		
	Bedridden	0	0%	0	0%	0	0%		
	Total	9	100%	71	100%	80	100%		
Current weight	Below 30 kgs	0	0%	1	1%	1	1%		
	30-39 kgs	0	0%	2	3%	2	3%		
	40-49 kgs	4	44%	16	23%	20	25%		
	50-59 kgs	2	22%	31	44%	33	41%	11.963	.035a,b,*
	60-69 kgs	0	0%	17	24%	17	21%		
	70 and above kgs	3	33%	4	6%	7	9%		
	Total	9	100%	71	100%	80	100%		
Most recent T staging (T1,T2,T3,or T4)	T1	9	100%	71	100%	80	100%		
	T2	0	0%	0	0%	0	0%		
	T3	0	0%	0	0%	0	0%		
	T4	0	0%	0	0%	0	0%		
	Total	9	100%	71	100%	80	100%		

Source: Own Survey, 2017

4.3. Multiple logistic regressions analysis of poor adherence to antiretroviral therapy and associated factors (n =80) *

The adjusted independent relationship between the independent variables under study and the dependent outcome variable using multiple logistic regression analysis showed that there is statistically significant relationship between adherence to antiretroviral therapy and satisfaction of the respondents by the improvement they obtain from the treatment (P_R6) with odds ratio (OR) 0.472 with a 95% confidence interval of 0.038 to 5.796. in addition Disclosure of their HIV status and Reminder use also show statistically significant relationship with the level of adherence.

Table 4. 7. Crude and adjusted odds ratios (OR) and 95% confidence intervals (CI) of determinants adherence to ART of the study population living with HIV/AIDS attending ART in Yergalem Health center Yirgalem southern Ethiopia August 2017

	Univariate analysis			Multivariate analysis		
Variables	*p-value*	*OR*	*CI 95%*	*p-value*	*Adjusted-OR*	*CI 95%*
Are you satisfied by the improvement you obtain for your treatment? (P_R6)						
Yes				.040		
No	.021			.557	.472	.038-5.796
Not Sure				.019	.040	0.003-0.586
Have you disclosed your HIV status to any one? (AD_AS1)						
Yes						
No	0.000			0.000	156.584	10.173-2410.148
Do you use reminder to take your drug? (AD-AS13)						
Yes						
No	0.000			0.000	156.584	10.173-2410.148

Source: Own Survey, 2017

4.4. Qualitative study findings

In order to triangulate the empirical findings of the qualitative aspects of the study it is better to present and discuss the results of the qualitative parts of the study. This qualitative study will help us to understand the reasons for ARV medication adherence from Health care workers, ARV users, case managers and adherence supporters. The findings of the qualitative study presented in two thematic areas i.e.: Patient related factors and Health care related factors.

Theme 1: Patient related factors

Category1: Economic

The FDG participants indicted that most of the clients taking ART in Yergalem HC are from low socio economic status and unemployed. Some patients generated a minimal monthly income not sufficient to cover the costs of their basic needs, including food. Thus, unavailability of food hindered patients from taking their HIV medications. Some of the patients, being dependent on the food supply from ART clinics, left their pill bottles with the nurses when they did not receive their food ration from the clinic. Some others patients believed that they had to consume costly food items to take their HIV medications.

During the discussion a women who has one HIV positive child, jobless and from around 20 KM from Yergalem health center mentioned that Previously, I was getting (an) additional nutrition supply, plumpy nut, for free from the ART clinic. But the other day, the nurse told me that she would not give it to me anymore. When I heard this, I felt angry and left the medication bottle on the nurse's desk and went away from the clinic. Due to this I did not take pills for five days.

Currently food by prescriptions (FBP) program phase-out from Yergalem Health center stopped food donations, patients complain about continuing ART. Some of them are even lost to follow-up because of the unavailability of food. (32 years, female, Adherence supporter,)

Most people do not have an idea that the medication can be taken eating any food available. They do not know that they can prepare the available food in the house with proper hygiene. They think the medicine will be harmful if they do not eat an expensive diet such as meat and eggs. (30 years, Male, ART clinician,)

Category II: Support from the family and community

Disclosing one's HIV status was found to be essential for receiving social support. Reminders to take pills, cover for transportation and food costs, and emotional backing were commonly reported. The most important way that patients received support was in reminders regarding the time they took pills. Patients received support usually from their partner, who himself/herself was also on ART, and/or children who were living with them. Experienced ART nurses and case managers noticed that transport and food support from NGOs had improved patients' attendance at ART clinics.

Sometimes when I feel fatigued, am busy with work or sleep at dose time my children remind me to take the pills. They bring me a glass of water and the medication bottle. (36 years, female, patient, casual worker,)

Aids from NGOs such as getting cooking oil, wheat, and soap until HIV patients recover from their illness and support themselves is one facilitator for adherence to ART. (46 years, male, case manager,)

Category III: Perception and Knowledge to about ARV

Most of the ARV users seem to have the basic knowledge about HIV disease and ARV. This might be due to repeated counseling sessions. A 40 years Female ART client mentioned that HIV is disease is caused by a virus.

In addition a 26 year male self employee explain that ,There are three major means of HIV transmission .i.e. unprotected sexual intercourse, mother to child HIV transmission during pregnancy, and breast feeding and contaminated sharp materials

With regard to ARV, Most patients had been confirmed as HIV-positive after suffering a long-term sickness. They had seen the devastating effect of HIV on their bodies and had vivid illnesses and stories. A significant improvement of health witnessed soon after initiating ART heightened trust in the medications.

Both patients and providers highlighted being healthy, improved appetite, increased weight and CD4 count, and prolonged lives as positive treatment outcomes. Patients were no longer bedridden, had strength, resumed work, and increased their incomes. These improvements inspired them to continue taking their medicines.

A 35years male farmer ART client mentioned that, I have decided to be more committed towards the treatment because I have seen the benefits of antiretroviral. My appetite has improved, I was bedridden, but now I am healthy and I usually find myself at the field for work…. I achieved all this because of the pills. Hence, I should not stop taking the pills.

... Improvement of health after treatment of OIs, being able to live longer and progressive increments of CD4 counts were the major factors strengthening medication taking. (24 years, male, nurse)

Category V: Religious Rituals

Regarding Religious rituals the majority of FDG participants mentioned the issues related with protestant Christian followers.

Two adherence supporter and case manger stated that: *previously especially the Ethiopian Orthodox Christian followers being baptized with holy water (in a monastery) were a big challenge for ART adherence and many patients were lost from follow up due to this reason. Due to the NGOs, GO and religious leaders collaborative effort the issue is solved. But recently some of the patients were lost to follow-up after they get prayer and told they are healed by the name of Jesus; they told us that they are cured from HIV/AIDS because of the prayer.*

Patients preferred complete cure from HIV/AIDS with the prayer service rather than taking pills throughout their life. Interviewees and focus group members reported discontinuation of ART treatment in those being got prayer form their pastors or prophet.

When I phoned a lost patient, a women with her 5 years child she told me that, the prophet call hers and hers child name and told us that we are healed/cured from HIV and told me to stop my medication .(Case manager Male 45 Yr)

One pediatric client of 12yrs returned to care after being lost from ART for two years. He has stopped taking ART for two years due to the above mentioned reason. (ART clinician)

Category VI: Stigma and Discrimination

Patients and healthcare providers frequently mentioned that stigma and discrimination caused patients trouble in taking, obtaining, and keeping medications.

Lack of privacy was a particular challenge for patients working in a private home or organization. Half of the patients were part-time workers, daily laborers or waiters. These patients were forced to work at a low wage rate for long hours to cover their living costs in places where their privacy could not be maintained. They had problems with finding a place to keep and take their medications; they thought that they had to hide their pills from employers and colleagues. Patients felt that they might be dismissed from their job if employers learned of their status.

A 32 Female adherence supporter stated that during counseling a women who was working as house made told me that that I can't take my drugs on time due to fear of losing my job if the owner saw me .one day she get me when I am taking medication and I lost my job .

Category VII: Reminder

Patients frequently mentioned that setting alarms on watches or mobile phones helped them to remember to take their pills. Seven respondents said they set alarms on their mobile phones or watches. Providers also stressed the benefit of reminders in avoiding pill missing due to hectic daily activity.

To take my pills on time, I set a reminder on my mobile phone…it reminds me of the time of my medication even when I forget it. (41 years, male, patient, casual worker)

Especially use of mobile phones or watch alarm tones is more sustainable for not forgetting taking pills. (27 years, female, case manager)

Theme II: Healthcare-Related Factors

Healthcare-related factors, such as patient education and counseling facilitated medication adherence, while room arrangement, poor laboratory service and frequent interruption of ARV medication impaired adherence and retention.

Category I: Counseling and Education

Education and counseling of patients in the ART clinics motivated them to take their pills. Case managers and ART nurses provided education, which focused on the importance of perfect adherence, strategies to improve adherence, consequences of non-adherence, possible side effects of the medications, and the duration of treatment required.

Every morning in the waiting room nurses and case managers teach us the consequences of not taking pills properly and the benefits of disclosure to family and the community. That helps me a lot to adhere to the treatment and improves my health condition. (36 years, female, patient, self-employed)

If the healthcare provider who initiated ART gives comprehensive education, including how long the medications will be taken, the possible side effects of the medications, the importance of the treatment, whether it cures or not, and checks patients' understanding at

the end, it will help patients to continue their treatment without interruption. (28 years, female, nurse)

The 32 years ART clinician mentioned that Referral of all volunteer ART clients from ART clinician to Case manger/Adherence supporter for counseling shall be strengthened. I have observed clients leaving the clinic just after collecting their ARV medication from ART nurse.

Category II: Service quality

Sub category I: clinical setting

Regarding Yergalem health center ART room arrangement it is difficult to insure confidentiality and privacy of the ART clients. Data clerk, ART clinician work in a single room.

During in-depth interview with the ART nurse and ART clinician, it is impossible to talk about private issues and to conduct physical examination at ART clinic .It is a must to go to other outpatient department to examine the patient. This in turn hinders service quality and it can also be a barrier for Good Adherence and retention to care.

There are clients who asked me to bring their medication while they are sited in the cafeteria of the health center due to fear the privacy/confidentiality (Male 45 Years case manager)

Sub category II: Laboratory Service and medication supply

Yergalem Health center has no any Lab machine to conduct Blood count&CD4 only microscope and rapid tests are available sample referral to Yergalem Hospital is mandatory.. Due to free reagent and test tube shortage CD4 referral is interrupted frequently.

It is difficult to monitor the progress of ART clients CD4 due to test tube supply interruptions (ART Nurse).

The result of CD4 count tests are delayed up to one week after the test; this need to be corrected. (32 years, female, Adherence supporter)

In summary the results of the qualitative study revealed that disclosure of HIV status, social support, use of reminders, life-long projects, counseling and education, and improved health on ART facilitated medication adherence and retention in HIV care. While economic constraints, with fear of stigma and discrimination, Prayer, poor healthcare services were perceived as barrier to good adherence.

4.2. Discussion

The study intended to assess the magnitude of adherence to antiretroviral therapy and its influencing factors among adult PLHIV attending ART clinic at Yergalem town health center, SNNP region of Ethiopia, in order to advise for appropriate strategies to improve adherence. The study explored several factors through structured questionnaires and focus group discussions with ART users, adherence supporters/case managers as well as in-depth interviews with health care workers. ART adherence was assessed by patients' self-report within the past seven days prior to interview. The study revealed that the prevalence of ART adherence level in the study clinic is (89%).

This result is higher than some of the studies done in different parts of Ethiopia including Yirgalem hospital in Yirgalem town,Dire Dawa town eastern Ethiopia, Jimma university teaching hospital, Southwest Ethiopia in which with the prevalence of adherence to ART medication were 74%, 65% and 63.8 % respectively. (Abera A, Fenti B, Tesfaye T, Balcha F (2015) ,Negesa L, Demeke E, MekonninW (2015)

Moreover, the result is comparable with different studies done in Harar town (Eastern Ethiopia) in which the prevalence of ART adherence level is (87%), Dessie Referral Hospital (Northern Ethiopia) in which the prevalence of ART adherence level is (90%)and Wolaita Soddo referral Hospital where the level of adherence is 87.4%. This might be following similar study methodology and use of similar questionnaires.(Alagaw A, Godana W, Taha M, Dejene T 2013& Arage ,2014&Mitiku H, Abdosh T, Teklemariam Z ,2013)

On other hand the prevalence level in Yirgalem health center ART clinic is lower when compared with WHO recommendation which is 95% or more. This alarms us to work more to increase and sustain the medical adherence level at its minimum recommended level.

In this study so many factors were considered to observe their association with ART adherence level. The survey revealed that there is significant association between Disclosure, reminder use and patients' satisfaction by the improvement they obtained and qualitative study shows disclosure of HIV status, social support, use of reminders, life-long projects, counseling and education, and improved health on ART facilitated medication adherence and retention in HIV care. While, economic constraints, with fear of stigma and discrimination, religious rituals Prayer (belief on cure of HIV), poor healthcare services were perceived as barrier to good adherence this finding is similar with the study conducted in different regions of Ethiopia .(Balcha TT, Jeppsson A, Bekele A (2011) ,Lifson AR, Demissie W, Tadesse A, Ketema K, May R, et al. (2013) and Gusdal AK, Obua C, Andualem T, Wahlstrom R, Tomson G, et al. (2009)

All the socio demographic variables such as gender, age, marital status, educational, occupations and monthly income were not significantly associated with adherence. These results were agreed with several studies elsewhere (Negesa L, Demeke E, MekonninW (2015) Mitiku H, Abdosh T, Teklemariam Z ,2013)But, the study revealed that among female respondents 86% adhered to ART while among the male respondents 95% adhered to treatment by direct interview indicating that there is slight difference in ART adherence with higher rate in males. This may be because females have burden of routine daily household activities which contributed to forgetting. Also during the in-depth interview the ART clinician reported that husbands with unknown HIV status don't allow their wives to take

ARV drug. This finding is similar with other study in wolayita soodo Hospital (Alagaw A, Godana W, Taha M, Dejene T, 2013).

Also the result of the qualitative study FDG revealed the major socio-economic constraint that negatively affected adherence and retention in HIV care were food insecurity. Patients also missed pills and stopped collecting repeat prescriptions from clinics when they could not afford to buy food, or when NGOs stopped supplying food rations. The negative impact of food insecurity on adherence has also been recognized in other studies conducted in sub-Saharan Africa.(Musumari PM, Feldman MD, Techasrivichien T, Wouters E, Ono-Kihara M, et al.. (2013) Weiser SD, Palar K, Frongillo EA, Tsai AC, Kumbakumba E, et al.. 2013)

Lack of job opportunities and food insecurity, while not exceptional to patients with HIV/AIDS, were exacerbated by the co-existence of other HIV-associated challenges such as stigma and discrimination, and reduced physical activity, medication schedules, and indirect treatment costs In this study 61% of the study participants were unemployed and 51% of participant income is between 250-500 moreover 45% of participants claimed not to have formal monthly income.

Disclosure of HIV status, social support, and use of reminders were identified as important facilitators of adherence also these factors are significantly associated with the rate of adherence. Other similar studies in Ethiopia, Nepal and Netherlands on African and afro-Caribbean also revealed similar findings. (Negesa L, Demeke E, MekonninW(2016). Stutterheim SE, Shiripinda I, Bos AE, Pryor JB, de Bruin M, et al. (2011) ,Wasti SP, Simkhada P, Randall J, Freeman JV, van Teijlingen E (2012) Case managers and ART nurses encouraged patients to disclose their HIV status to family members or close friends who can provide them social support, reminders about pills, financial assistance, and

emotional backing to facilitate medication taking this study and elsewhere (Stutterheim SE, Shiripinda I, Bos AE, Pryor JB, de Bruin M, et al. (2011) Wasti SP, Simkhada P, Randall J, Freeman JV, van Teijlingen E (2012) Case managers at the clinics are also working to deliver emotional support and resolve patients' problem based on their experiences living with HIV.

One facilitator of medication adherence was the use of electronic devices, such as mobile phones and alarms. These have the advantage of reminding patients of their medication times without the need for disclosure of their HIV status to others. Access to mobile phones is increasing in Ethiopia and setting alarm tones on mobile phones helped patients to remember to take pills. Randomized controlled trials in Kenya reported a mobile phone short message service improved adherence to ART treatment and retention in medical care (Pop-Eleches C, Thirumurthy H, Habyarimana JP, Zivin JG, Goldstein MP, et al. (2011) and Lester RT, Ritvo P, Mills EJ, Kariri A, Karanja S, et al. (2010)

During the FDGs and in-depth interview Socio-cultural factors, such as stigma and discrimination and religious rituals, also had undesirable effects on medication adherence and remaining in care. patients in this study had concerns about being stigmatized and losing their jobs if their HIV status was discovered when they took pills in front of work colleagues or asked permission from their employers to collect medications at appointment dates is consistent with findings of other qualitative studies (Wasti SP, Simkhada P, Randall J, Freeman JV, van Teijlingen E (2012)and Adeneye AK, Adewole TA, Musa AZ, Onwujekwe D, Odunukwe NN, et al. (2006) .

Religious beliefs are complex cultural concepts and influenced patients' treatment with anti retroviral in this sample of study; this has been reported elsewhere (Finocchario-Kessler S,

Catley D, Berkley-Patton J, Gerkovich M, Williams K, et al. (2011) .Going to protestant churches to get a prayer or to receive prophecy that the ARV user is healed or cured form HIV found to be the most important reason for patients being lost to follow-up in recent few years. In addition Poor service quality like laboratory service, medication supply interruption is also the perceived barriers among the FGD participants.

5. CONCLUSIONS AND RECOMMENDATIONS

5.1. CONCLUSIONS

Scale-up of treatment and care for patients with HIV/AIDS in Ethiopia has been a decisive clinical achievement. The full benefit of the scale-up cannot be realized without achieving long-term optimal adherence and retention in care. The level of adherence in Yergalem HC is found to be 89% which is below WHO recommendation. Moreover, the quantitative study revealed that there is significant association between rate of adherence and factors like Disclosure, reminder use and patients' satisfaction by the improvement they obtained and qualitative this study revealed that economic constraints, perceived stigma and discrimination, going to protestant churches to get a prayer or to receive prophecy that the ARV user is healed or cured form HIV and poor healthcare services hamper adherence to ART and retention in care. Conversely, disclosure of HIV status, social support, use of reminder aids, having life-long projects, and patient education and counseling facilitated adherence and retention in care. International studies have demonstrated that interventions directed at many of these factors have encouraged patients to achieve optimal adherence and remain in care. Interventions integrating enhanced treatment access with improved job and food security, supporting healthcare providers, development of social policies and cooperation between various agencies are required to facilitate optimal adherence to ART, retention in care, and improved patient outcomes.

5.2. RECOMMENDATIONS

5.2.1. For Yergalem Health center

+ Health education should be given by health professionals (caregivers) for the patients to increase awareness about the importance of ART adherence for PLWHA and problems of non-adherence.

+ Health care workers, case managers/adherence supporters should promote disclosure of their HIV status to their families, relatives or friend.

+ Given many Ethiopian HIV-positive patients are illiterate and depend on traditional ways of time counting, which do not measure point to point medication time and influenced by many factors, the healthcare providers need to train patients how to use the simple electronic reminder devices to improve adherence.

+ Intervention to promote adherence should focus on area of promoting use of different memory aids like watches, mobiles...

+ Quality of care in terms of service quality, medication and laboratory supply availability need to be improved

5.2.2. For Yergalem city administration health office

+ Interventions on community levels, such as community care centers and home-based care, need to be expanded at the village level to overcome these barriers.

+ Proactive strategies to improve access to jobs and food security for patients taking ART are required in Ethiopia. Both governmental and non-governmental organizations need to work in coordination to address the multilayered disadvantages in patients receiving ART

- Stakeholders, governmental and non-governmental, should work with religious authorities to reduce the negative impact of recently emerging prayer for cure of HIV on medication-taking especially with protestant Christian church leaders and to improve the general service quality.

References

Alagaw A, Godana W, Taha M, Dejene T (2013) Factors Associated with Antiretroviral Treatment Adherence among Adult Patients in Wolaita Soddo Hospital. J Trop Dis 1:125. doi:10.4172/2329-891X.1000125

Arage et al.: Adherence to antiretroviral therapy andits associated factors among children at South Wollo Zone Hospitals, Northeast Ethiopia: a cross-sectional study. BMC Public Health2014 14:365.

Abera A, Fenti B, Tesfaye T, Balcha F (2015) Factors Influencing Adherence to Antiretroviral Therapy among People Living With HIV/AIDS at ART Clinic in Jimma University Teaching Hospital, Southwest Ethiopia. J Pharma Reports 1: 101.

Balcha TT, Jeppsson A, Bekele A (2011) Barriers to antiretroviral treatment in Ethiopia: a qualitative study. J Int Assoc Physicians AIDS Care (Chic) 10: 119–125.

Bonolo, Palmira de Fae, Casar, Cibele C b, Acurio, Fransisco A ac, et al. Non-adherence among patients initiating antiretroviral therapy: a challenge for health professionals in Brazil. JAIDS. 2006; 19 Sppl4: S5-S13.

Carballo E, Suarez CC, Carrera I, et al. Assessing relationships between health-related quality of life and adherence to antiretroviral therapy. Qual Life Research 2004 Apr; 13(3): 587-99.

Ethiopian Federal Ministry of Health HIV/AIDS Prevention and Control office (HAPCO) (2016) Country progress report in HIV/AIDS response. Addis Ababa: Ethiopian Federal Ministry of Health HIV/AIDS Prevention and Control office.

ENHRI and FMOH. (2017).HIV related estimates and projections of Ethiopia. Addis Ababa: FMOH.

FHAPCO. (2017). Multi-sectoral HIV/AIDS Response Annual Report. Addis Ababa: FHAPCO.

FHPCO, FMOH. (2009).Guideline for the implementation of HIV/AIDS case management in Ethiopia. Addis Ababa. FMOH.

Gusdal AK, Obua C, Andualem T, Wahlstrom R, Tomson G, et al. (2009) Voices on adherence to ART in Ethiopia and Uganda: a matter of choice or simply not an option? AIDS Care 21: 1381–1387.

Gifford AL, Borman J E, Shively MJ, et al. Predictors of self-reported adherence and plasmaHIV concentrations in patients on multi drug antiretroviral regimens. JAIDS. 2000; 23(5): 386-95.

Hogan D, Salomon J. (2010). Prevention & treatment of HIV/AIDS in resource limited settings. Bulletin of WHOM. Vol.83, No 2 Geneva.

Lifson AR, Demissie W, Tadesse A, Ketema K, May R, et al. (2013) Barriers to retention in care as perceived by persons living with HIV in rural Ethiopia: focus group results and recommended strategies. J Int Assoc Provid AIDS Care 12: 32–38.

Nachega J. B, Stein D M, Lahnan D.A, et al. Adherence to Antiretroviral Therapy in HIV Infected Adults in Soweto, South Africa, AIDS Research and Human Retroviruses. 2004;20(10):1053-1056.

Nachega J. B, Stein D M, Lahnan D.A, et al. Adherence to Antiretroviral Therapy in HIV Infected Adults in Soweto, South Africa, AIDS Research and Human Retroviruses. 2004; 20(10):1053-1056.

Negesa L, Demeke E, Mekonnin W(2016). Adherence to Antiretroviral Therapy and Factors affecting among People Living withHIV/AIDS and Taking Antiretroviral Therapy, Dire Dawa Town, Eastern Ethiopia. J Infec Dis Treat. 2017, 3:1.

Mengesha A, Worku A. (2011). Assessment of antiretroviral treatment among HIV infected persons in the Ministry of Defense Hospitals.(MPH Thesis) department of public health, faculty of medicine, Addis Ababa University, Ethiopia.

Muluneh and Ezra. (2010). Adherence to ART and its associated factors among HIV Aids Patients in Addis Ababa. Science and Technology against Microbial Pathogens: Singapor.

Merten S, Kenter E, McKenzie O, Musheke M, Ntalasha H, et al. (2010) Patient-reported barriers and drivers of adherence to antiretrovirals in sub-Saharan Africa: a meta-ethnography. Trop Med Int Health 15 Suppl 116–33.

Musumari PM, Feldman MD, Techasrivichien T, Wouters E, Ono-Kihara M, et al.. (2013) "If I have nothing to eat, I get angry and push the pills bottle away from me": a qualitative study of patient determinants of adherence to antiretroviral therapy in the Democratic Republic of Congo. AIDS Care

Mitiku H, Abdosh T, Teklemariam Z (2013) Factors Affecting Adherence to Antiretroviral Treatment in Harari National Regional State, Eastern Ethiopia. ISRN AIDS, Hindawi Publishing 2013: 1-7.

PEPFAR & Global AIDS Annually, PEPFAR reports on results achieved by its programs across the range of prevention, treatment and care programs (https://www.hiv.gov/federal-response/pepfar-global-aids/pepfar, retrieved, Sep22, 2017).

Palar K, Martin A, Oropeza Camacho ML, Derose KP (2013) Livelihood experiences and adherence to HIV antiretroviral therapy among participants in a food assistance pilot in Bolivia: a qualitative study. PLoS One 8: e61935

Portelli MS, Tenni B, Kounnavong S, Chanthivilay P (2012) Barriers to and facilitators of adherence to antiretroviral therapy among people living with HIV in Lao PDR: a qualitative sRotberg RI, Aker JC (2013) Mobile phones: uplifting weak and failed states. The Washington Quarterly 36: 111–125

Rathavuth Hong VM, Govindasamy P (2008) Factors associated with prevalent HIV infections among Ethiopian adults: Further analysis of the 2005 Ethiopia demographic and health survey. Calverton, Maryland, USA: Macro International Inctudy. Asia Pac J Public Health.

SNNPR RHB. (2016). HIV testing and care and treatment catch up campaign final draft document. SNNPR, Hawassa: RHB.

Tadios Y, Davey G. (2011). Retroviral drug adherence & its correlates in Addis Ababa, Ethiopia; Ethiop Med J; 44:237-244.

UNAIDS "Joint United Nations Program on HIV/AIDS (UNAIDS) Globalreport" (2010) UNAIDS report on the global AIDS epidemic.

Wasti SP, Simkhada P, Randall J, Freeman JV, van Teijlingen E (2012) Factors influencing adherence to antiretroviral treatment in Nepal: a mixed-methods study. PLoS One 7: e35547.

Wasti SP, van Teijlingen E, Simkhada P, Randall J, Baxter S, et al. (2012) Factors influencing adherence to antiretroviral treatment in Asian developing countries: a systematic review. Trop Med Int Health 17: 71–81.

Weiser SD, Palar K, Frongillo EA, Tsai AC, Kumbakumba E, et al.. (2013) longitudinal assessment of associations between food insecurity, antiretroviral adherence and HIV treatment outcomes in rural Uganda. AIDS.

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Appendices
  I.   Appendices interview schedule

This questionnaire is prepared to ask patients enrolled to ART care on ART adherence at

Yergalem health center

My Name is ----------------------------working as a data collector for Hanna Reta for the

purpose of partial fulfillment of master degree in social work. She is conducting a study on

ART adherence at Yergalem health center the information you give will contribute to

measure that are taken on ART adherence. If you agree to be involved in this study, I would

like to ask some questions and this will take about 30-15 minutes. The information you give

will be kept confidential. If there is any problem you can stop at any time.

I agree to participate in this study?

1. Yes (continue to ask the question)   2.No (stop to ask the question)

Interviewer Name: --------------------------------   Supervisor name: ---------------------------

Signature: ---   Signature : ----------------------------------

Date of data collection: -----------------------

Unique ART number (UAN): -------------------------

SECTION 1. SOCIO DEMOGRAPHIC CHARCTERSTICS

NO.	Questions	Coding categories
101	Sex	1.Male
		2.Female
102	Age	
103	Ethnic groups	1.Amhara 2. Oromo 3. Tigray
		4.Gurage 5. Others Specify---------

104	Marital status	------------------- 1.Unmarried 2.Married 3.Divorced 4.Separated 5.Widowed
105	Religion	1.Orthodox 2. Catholic 3.Protestant 4. Muslim 5.Other---------------------
106	Educational status	1.Illitrate 2. Read and write 3.Elementary 4. High school 5.Above high school
107	Occupational status	1.Governmnt employee 2.House wife 3.Farmer 4.Unemployed 5.Daily laborer 6.Student 7-Others Specify---------------------
108	Monthly income (in Birr)	1.No income 2.200-250 3.251-500 4.501-999 5.100-2000 6.2000-3000 7.>3000

Section 2: Knowledge about adherence

NO.	Question	Coding categories
201	When did you hear about ARV?	1.Before my illness 2.After my illness 3.During my illness
202	From where did you get the information about ARV?	1.Health care professional 2.Mass Media 3.Others specify----------------------------
203	Do you think ART benefits you?	1. Yes 2. No
204	Are you committed/ convinced to start ART?	1. Yes 2 .NO
205	After you have started ART, what benefit did you get?	1. Improved quality of life 2. Weight gain 3. Reduced fever 4. Reduction of hospitalization 5. Reduced frequency of diahorrea 6. No benefit at all
206	Do you know the importance of	1.Yes

	adherence before you start ART?	2.No
207	How long have you been on ART?	_____(in months)
208	Have you disclosed your HIV status to any one?	1. Yes 2. No
209	If yes to the above question to whom?	1. Wife 2. Family and relatives 3. Friends 4. Others specify
210	When taking ART, AIDS will be delayed?	1. Yes 2.No
211	When taking ART, an HIV infected person will be cured from AIDS	1. Yes 2.No
212	When taking ART, it can happen that one may get sick from the RX itself?	1. Yes 2. NO
213	When taking ART, do you think the person will live long?	1. Yes 2.NO
214	When one takes ART, it has to be taken at specific time?	1. Yes 2.NO
215	When one takes ART the daily dose should be respected not be skipped?	1. Yes 2.NO
216	You should take pills for the rest of your life to delay the development of AIDS?	1. Yes 2.NO
217	Are you taking fixed dose combined or single drugs?	1. Yes 2.NO
218	What do you suggest about a fixed dose combined or single drugs?	1.Reduced pill burden 2.Eay to remember 3.Easy to take 4.I do not know
219	Do you feel comfortable when taking ART in front of others than before?	1. Yes 2.NO 3. not sure
220	Does the RX schedule fit the daily routine than the previous?	1. Yes 2.NO 3. not sure
221	What types of schedules do you use to remember to take your medication?	1. Pill box 2. Written reminder 3. Watch bell 4. Cell phone reminder 5. Don't have

Section 3.Patient/Adherence supporters/care givers relation ship

NO.	Question	Coding categories
301	Are you satisfied with the clinical service?	1. Yes 2.NO 3. not sure
302	Do you have open communication with health care providers treating you?	1. Yes 2.NO 3. not sure
303	Do you obtain education or assistance when you need help during your visit?	1.Evey month 2.every two months

		3.every three months
304	Do you know adherence supporters?	1. Yes 2.NO
305	Have you got adequate adherence counseling service from adherence supporters?	1. Yes 2.NO
306	Are you satisfied by the improvement you obtain for your treatment?	1. Yes 2.NO 3. not sure
307	Are you satisfied in the confidentiality of the treatment unit?	1. Yes 2.NO 3. not sure

Section 4. Health care system and clinical setting

NO	Questions	Coding categories
401	How far is your residence from the ART unit you are attending	_____(in k.m)
402	What means of transportation do you use to visit ART clinic	1.On foot 2.Public transport 3.Own vehicle 4.Taxi 5.Others specify-------------
403	Are you satisfied in the scheduling appointment of the treatment unit?	1.Yes 2.NO 3.sure

Section 5: Adherence assessment

NO	Question	Coding categories
501	Have you ever missed your ART drug	1. Yes 2. NO 3. I don't know
502	If yes to 601 How frequent?	1.1-2 dose per month 2.3-5 doses per month 3.6 or more per month
503	How many doses have you missed in the last 7 days	1.one dose only 2.Two doses only 3.3 or more than 3 doses

Section 6: Data abstraction form

NO	Question	Coding category
601	Current functional status	1.Working 2.Ambulatory 3.Bedridden
602	Current weight	------------Kg
603	Most recent staging: look at the follow up card and circle the appropriate corresponding staging either WHO or T staging WHO staging coded as 1,2,3, or 4 T staging coded as T1,T2,T3,or T4	1 2 3 4 T1 T2 T3 T4

604	Medication Adherence level	Good
		Fair
		Poor

II.   Appendices

FGD schedule /Checklist

1. Do ART patients face any problems with adherence to their medication? (Probe:

> 1.1 Demography (age, sex, education, occupation, socioeconomic status, marital status)

> 1.2 Information (knowledge, self-efficacy, coping, etc.)

> 1.3 Motivation (belief, attitude towards ART, mental status, treatment outcome, support from family, community)

> 1.4 Service quality (trust to health provider, interaction b/w provider-client, facility and equipment)

> 1.5 Regimen-Simplicity, toxicity, disruption of daily activity

> 1.6 Accessibility (cost, distance and time)

2. What are the perceptions/beliefs/attitudes of the community on HIV/AIDS, treatment modalities?

3. How easy for AIDS patients to access ART in your community?

(Probe on stigma, discrimination, and logistics issues for reaching the clinic etc)

III.   Appendices

In-depth interview with health care workers

1. How do you perceive adherence level of ARV users in this clinic?

2. What facilitating and barrier factor you observe for ART adherence from your observation?

3. How do you perceive the quality of care the hospital gives to ART clients?

4. Any general comment you want to add?