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DEPARTMENT OF NURSING

DRUG ADHERENCE AND ASSOCIATED FACTORS AMONG PATIENTS ON ART AT GURAGE ZONE HOSPITALS, SNNPR, ETHIOPIA

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A RESEARCH PAPER TO BE SUBMITTED TO WOLKITE UNIVERSITY, COLLEGE OF MEDICINE AND HEALTH SCIENCES, DEPARTMENT OF NURSING, FOR THE PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR DEGREE IN NURSING

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ABSTRACT

Background: Antiretroviral therapy has an impressive clinical effect on the human immunodeficiency virus. Since the introduction of Antiretroviral Treatments, morbidities and mortalities due to HIV/AIDS have been significantly reduced. Adherence is the most important factor in determining Antiretroviral Therapy (ART) treatment success and long-term viral suppression.

Objectives: The aim of this study is to assess the adherence rate of patients on antiretroviral drugs and associated factors among HIV positive patients at Gurage zone hospitals, SNNPR, Ethiopia, 2021.

Methods: An institutional based cross-sectional study was conducted from July 1-July 30, 2021 in Gurage zone hospitals, SNNPR of Ethiopia. A total of 342 study participants were participated in the study and systematic random sampling technique was used to select 342 study participants from each hospital. The data collected by using structured questionnaires through face to face interview and observation of patient card were edited, coded and entered into SPSS version 20 for analysis. In binary logistic regression variables with P-value <0.25 were considered to measure the association between dependent and each independent variable. In multivariable logistic regression variables with P-value ≤ 0.05 were considered statistically significant between independent variables and the outcome variable (medication adherence). Adjusted odds ratio (AOR) with a 95% confidence interval was used to determine the strength and direction of the association.

Results: A total of 342 participants were included in the study with the response rate of 100%. The mean age of participants was 34.88 (SD ± 9.517) years with a maximum age of 67 and a minimum age of 19. The overall rate of adherence to ART was 78.4%. Having ARV drug side effect (AOR=0.328; 95% CI: 0.130, 0.830), having educational level of primary school (AOR=0.241; 95% CI: 0.072, 0.809), poor knowledge about HIV and its treatment (AOR=0.104; 95% CI: 0.028, 0.391), and HIV staging III (AOR=0.155; 95% CI: 0.029, 0.812) were negatively associated with good adherence. Whereas, average monthly income (AOR=6.195; 95% CI: 1.486, 25.822), one tablet taken in a day (AOR=26.959; 95% CI: 5.167, 140.660), and having no perceived social stigma (AOR=7.269; 95% CI: 2.290, 23.074) were positively associated with good ART drug adherence.

Conclusion and recommendation: In this study, the rate of adherence to antiretroviral therapy was low when compared to WHO standard. It is important to provide information to patients on their treatment plan to ensure patients keep their regular follow up, to improve patient's trust with clinician.

Keywords: HIV positive patients, antiretroviral therapy, Adherence, Gurage, Ethiopia

ACKNOWLEDGEMENT

First, we would like to express our deepest appreciation to our advisor Mr. Fantahun Walle and Mrs. Betelhem Tadesse for their dedicated effort, constructive criticism, encouragement, valuable comments and advices that enabled the production of this research paper.

We are also very grateful to express our deepest thanks to Wolkite university and department of Nursing for providing us such an opportunity.

The last, but not the least, our gratitude extends to the study participants for their volunteer and allowance to us on our data collection, and health workers for their support and cooperation during data collection.

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ACRONYM AND ABBREVIATION

HIV: Human Immune Deficiency Virus

AIDS: Acquired Immune Deficiency Syndrome

ART: Anti-Retroviral Therapy

ARDs: Anti-Retro viral Drugs

HA ART: Highly Active Antiretroviral Therapy

PLWH: People Living With HIV

WKUTCSH: Wolkite university teaching and comprehensive specialized hospital

WHO: World health organization

ADRs: Adverse drug reactions

USA: United States of America

SNNPR: South nation nationalities and peoples of republic

SPSS: Statistical product and service solution

CHAPTER ONE

1. INTRODUCTION

1.1 Background

The Human Immunodeficiency Virus/ is one of the most common destructive epidemics and a major threat to world population, that affecting overall social, economic and political wellbeing as well as individual health [1].

To ensure the lifesaving treatment success for a million of HIV/AIDS positive people around the world, one target is developed by WHO which 90-90-90 target is set [2]. Therefore, the major goal of 90–90– 90 targets is to achieve 90% diagnosis from all HIV-positive persons, to provide Antiretroviral therapy for those 90% diagnosed HIV-positive persons, and to achieve viral suppression for 90% of those which treated by 2020 [3]. This estimation is to result in 73% of HIV-people patients achieving full viral suppression [4].

HAART is the medical therapy which celebrated in the reduction of mortality and morbidity to improve quality of life for PLWH. It is the potent and effective new combinations of antiretroviral agents, which have a proven efficacy in the reducing of viral load, morbidity and mortality. So that it has a great effect to increase the quality of life for PLWH. Around >95% of drug adherence is necessary to achieve full and durable viral suppression and to prevent drug resistance [5, 6].

Adherence is defined as an extent to which a patient continues an agreed treatment plan by taking medications or interventions correctly according to prescription. To assessing adherence there are different methods and the level of adherence is specific not only to places and patient groups but also to the method of adherence measurement used [7]. These include direct or indirect methods: biologic markers and body fluid assays are direct methods and self-report, interview, pill counts, pharmacy records, computerized medication caps, and viral load monitoring are examples of indirect methods. While a combination of these methods may be employed, among those methods patient self-report is the most widely used [8] given its ease of implementation and use of already existing resources.

The standard recommended antiretroviral therapy (ART) consists a minimum of three combined ARV drugs. This is important to suppress the HIV viral load and to stop the HIV disease progression [9].

To control and prevent AIDS epidemic across the globe, ART plays a great role which helps to improve the quality of life and to reduce mortality and morbidity for PLWH. ART effectively suppresses viral replication when ART taken at a regular time, it suppresses effectively the viral replication in the body and also it decreases the onset and progression of other opportunistic infections. It also plays a great role to decrease the viral load and to increase the CD4 counts. However, ART drugs aren't cure HIV infection from the patient, but it can control the progression of the disease [10, 11].

In developing countries, the magnitude of drug adherence is poor than that of the developed countries. To ascertain the true extent of drug adherence, data in developing countries among important subgroups of the population such as adolescents, children and marginal populations are required [12].

In our country, many researches have been conducted on drug adherence and associated factors among HIV-positive patients on ART which is not a national based but a local based research [13-16].

Those studies have reported a multiple of factors are influencing ART adherence at different conditions; however, these findings were different based on the contexts of the studies. In this regard, there have been very limited researches in Gurage zone, south Ethiopia. Therefore, the aim of this study is to determine the drug adherence and its associated factors among HIV positive patients who taking ART in Gurage zone hospitals.

1.2 Statement of the problem

Across the globe around 36.7 million peoples are infected and living with HIV/ AIDS. In a year around 1.8 million are newly infected with HIV/AIDS. Many peoples are died as a result of AIDS related illness across the world, which is almost (830000-1.2 million) [17]. A national estimate in 2016 shows that approximately 39,397 peoples are infected and living with HIV [18].

In Sub-Saharan African region, the prevalence and incidence of HIV/AIDS is higher than that of other regions in the world [19]. Approximately two-thirds of HIV positive peoples are living in sub-Saharan African region [20].Botswana and Rwanda, the two Sub-Saharan African country have achieved a universal access target (ART treatment coverage of more than or equal to 80% of patients in need) at the end of 2009, while other countries like Ethiopia, Zambia, Namibia, and Senegal are moving closer to achieve the same target having covered 50–80% of HIV positive patients in the need of treatment [21]. In eastern and southern African region approximately 800,000 peoples are newly infected and about 310,000 peoples were died in the year of 2018. However; the ART coverage in this region is less when compared to other world regions. For instance, the coverage of ART in some countries is only 9%. In this region, mortality is one factor to attribute the continued challenges of ART adherence to be retaining [22].

In Ethiopia, the number of HIV infections among adult was estimated about 722248 in a year 2017, it was increasing from a year 2016 by 3748 infections [23].

For most patients ART is one of the most celebrated treatments to reduce morbidity and mortality, but near perfect (>95%) adherence is necessary to achieve full and durable viral suppression and also to prevent drug resistance [5, 6].

The coverage of ART services across the globe shows a dramatic change which includes low- and middle-income countries, but there are still challenges in helping patients to adhere to their initiated antiretroviral drugs [24].

In most developing countries such as Ethiopia, the level of drug adherence by HIV-positive patients to their medication is challenging [25]. HIV positive patients who have not adhere to their medication can develop a numerous problem such as increased disease progression, hospitalization, finally death. Moreover, non-adherence to ART can also affects the community by facilitating the transmission of HIV [26, 27].

If the level of adherence to highly active antiretroviral therapy (HAART) becomes poor, the effectiveness of ART will be diminished. The viral dissemination will also become accelerated and drug resistances can happen [28, 29]. This catastrophic event affects patients by decreasing their quality of life and the community as well as the health system by increasing medical costs. There has been a considerable progress of access to ART and HIV counseling and testing in Ethiopia [30].

In another way adherence to medication is affected by different factors such as treatment regimen complexity, patient related variables, patient-healthcare provider relationships, and the quality of healthcare services [31]. There are also many factors which influence Patient adherence to ART such as pill burden, frequency of dosing, ADRs, and dietary restrictions [32]. Similarly, there are also patient related factors such as lack of transport, shortage of food, use of traditional medicine, alcohol abuse, depression, stigma and discrimination, and lack of social support undermine adherence [33]. Further, a poor patient-healthcare provider relationship and low quality services, such as lack of confidentiality and privacy and drug stock-outs, can also hamper the patients' adherence to ART [34], despite the fact that assessing the level of patient adherence to ART and its associated factors are crucial for further improvement of ART adherence.

Interventions at patient level, at the medication distribution level, at health care delivery level and at the community levels are required to achieve good adherence. But this is a serious challenge in a country with a resource constraint and little experience in managing such a complex regimen treatment programs [35, 36]. Ethiopia is among one of the developing countries which faces this challenge.

1.3 Significance of the study

Since the introduction of ART, there is a substantial reduction in the mortality and morbidity of PLWH. Such achievement always needs near total adherence to ART. And adherence is one of the few potentially alterable factors in determining out comes for in PLWH.

This study provides information on ART drug adherence and its associated factors among HIV positive patients in Gurage Zone Hospitals. It will thus help improve care of patients living with HIV and lay ground for further study to be performed in the area.

CHAPTER TWO

2. LITERATURE REVIEW

A cross sectional study conducted in Northern Peru suggested that among all study participants only 41.7% receiving their drug correctly and 58.3% were not consistently adhere to their medication. There were significant risk factors for non-adherence; comorbid problem like tuberculosis, discomfort with the ART regimen, and previous pauses an ART. The multivariate analysis of nested models that indicated having children is a protector factor for ART drug adherence [37].

One research conducted in Nepal showed that the overall drug adherence among HIV positive patients was found to be 87.4%. Wrist watch and mobiles were seen as a facilitating factor to take ART on time as clients taking ART used to set alarm to get informed of the medication time. In this study ART drug Adherence was associated with female sex, family consisting only parents and their children, having no habit of taking alcohol, HIV duration of more than 3 years, picking up ART medications on their own and not having side effects of ART [38].

One research conducted in India showed that 89.5% of HIV patients among study participants were high level of adherence to their medication and the remaining 10.5% were medium level of adherence. In this study, factors that contributing to high adherence level were confidentiality and trust among health workers, concerned about their own health, understanding about the prescribed drugs, idea about disease progression, effectiveness and knowledge of anti- retro viral drugs [39].

Another study conducted in consecutive samples of people living with HIV who had newly initiated antiretroviral therapy in China showed that out of the study participants, 85.5% were good adherence and the remaining 14.5% were poor adherence. In this study patients with non-disclosure of their HIV status and patients with depression had poor adherence to their drug [40].

Another cross-sectional study conducted in India showed that 60% of respondents had fully adhered. Adherence was statistically significantly linked to regular follow-up attendance (70.5%, $p = 0.002$). No other results were statistically significant but trends were found. "100% adherence" trends were seen in older patients, male gender, those from larger families,

those who had a previous AIDS defining illness, those taking fewer tablets, and without food restrictions. Commonest side-effects causing non-adherence were metabolic reasons (66%) and GI symptoms (50%) [41].

A multi-center retrospective analysis was conducted in the Eastern Cape Town, South Africa to assess Factors that affecting adherence to antiretroviral therapy among pregnant women. In this study 69% of women among study participants were reported as perfect adherence. But, the remaining 31% had non-adherence to their ART. Analysis of this study revealed that drug-related side-effects, being away from home, forgetfulness, non-disclosure of their HIV status, stigma and work-related demand had the main reasons for non-adherence to ART [42].

Another cross-sectional study conducted at the regional hospital of Sokodé, Togo indicates that 78.4% among study participants were good adherence to their medication. Associated to this level of education, alcohol consumption, ART perception and HIV status disclosure to sexual partner were significantly associated to the study [43].

A research conducted in Egypt Showed that 27% among HIV infected populations are adhering to ART. The results showed that there were five key factors that served as obstacles to adherence to treatment, which were "fear of stigma, financial constraints, and characteristics of ART, social support, and reliance on faith" [44].

A cross- sectional study conducted in South Sudan showed that among HIV-infected children 30.2% had not adhered to ART. The adherence rate to ART were 69.8%, out of this 55.7% were male. This study finding indicated that ART adherence among HIV-infected children less than five years was sub-optimal. In this study there were different factors that significantly associated with ART adherence; those are type of ART regimen, type of work done by the caregiver to earn a living, type of ART regimen, the time that the child was initiated on ART, caregiver and child relationship, caregiver and spousal support, the person that administer ART to the child, type of adverse effects suffered by the child, and improvements in quality of HIV services [45].

One research conducted in Hara town and its surrounding, North-Eastern Ethiopia showed that 71.8% among the respondents of HIV patients were good adherent level to their ARDs. Among those participants who had not complained drug side effects were 2.69 times more likely to adhere to their ART medication than those who had complained drug side effect [46].

A research conducted to analyze the national prevalence of HAART adherence among HIV positive children in Ethiopia based on regional analysis showed that HAART adherence in Amara, Addis Ababa, and Tigre was 93.4%, 90.1%, and 87.3% respectively. This study suggests that children adherence to HAART in Ethiopia was a good progress [47].

Another research conducted in northern Ethiopia to assess the level of adherence and associated factors among adolescent and adult patients on ART showed that about 94.84% among study participants were good adherence to their ARV medication. In this study there were different factors that significantly associated with HIV/AIDS patients on their ARV medication. Among those factors being male patients, patients from general hospitals, WHO staging IV and non-suppressed viral load (VL) status had negatively associated with good adherence. But, age of 50+ years' old, recent CD4 count of 200–499 and recent CD4 count of 500 and above had positively associated with good ART drug adherence [48].

One study conducted in north Ethiopia; Gondar showed that the overall rate of adherence to ART was 88.2%. In this study Prevention of co-morbidities, encouraging HIV positive individuals to disclose their HIV status, recentCD4 count ≥ 500 mm3, and urban residence were significantly associated with adherence to antiretroviral therapy. [49].

A cross-sectional study conducted in Tikur Anbessa, Zewditu and St Paul's Hospitals at anti-retroviral therapy clinic showed that among the respondents, 73.3% HIV positive patients were adhered to their medications (Anti-Retroviral Therapy). HIV positive patients who had good relationship with health care provider were more likely to adhere to ART compared to those who had poor relationship. Those who stated stigma and discrimination as a major problem were 81% less likely to adhere to ART compared to those who stated stigma and discrimination not to be a problem at all [50].

An institutional based cross- sectional study was conducted to assess the level of ART adherence and its associated factors among adult PLWHA who were on antiretroviral therapy in Gobba Hospital; Southeast Ethiopia, reflected that 90.8% of HIV patients among all study participants were good adherent to their medication. Whereas, the rest of participants 9.2% were poor adherence to their medication. In this study adherence to ART was associated with different factors such as drug abuse, interaction with clinician, feeling comfort while taking medication in front of others and attending appointments regular. In addition to this the major reasons for low drug adherence were forgetfulness, away from home (travel), being busy with other things, felt sick and sleep [51].

In other study conducted in West Ethiopia, Nekemt Out of a total study subject 73.1% were adherent to their medication. Having knowledge about HIV and its treatment, having strong family/social support, absence of adverse drug reaction, absence of comorbidity of other chronic diseases and disclosing HIV status to the family were significantly associated with an increased likelihood of adherence to Antiretroviral medication. Limitation of this study was suggested that, the results aren't generalized to people living with HIV/AIDS in Ethiopia and Causality isn't being confirmed due to cross-sectional study design [52].

Another cross-sectional study conducted in South Western Ethiopia, to determine Adherence and Its Associated Factors Among Adult HIV-Infected Patients on Antiretroviral Therapy, showed that 83.3% among the study participants had good adherence to ART. Related to this study Residency being urban, being disclosed their HIV status, and CD4 category greater than or equal to 500 cells/mm 3 were positively associated with adherence. Whereas, Age 39–49 years, educational status, comorbid to other disease, and WHO clinical staging (II, III) were negatively associated with ART adherence **[53]**.

A research conducted in southern Ethiopia to determine the ART adherence among adult persons living with HIV/AIDS showed that 68% of the study participants had found to be suboptimal level of medication adherence and the remaining 32% had poor adherence to their ART medication. In this study fear of adverse effect and forgetting to take medications were the major reasons for poor adherence to the treatment. Among Limitation of this study absence of causality assessment for ADR, missing of some data due to chart review and self-report of data collection are listed [54].

The research performed on the review published and abstract reports in patient adherence to HIV medication showed that supporting the patient throughout his/her treatment, perceived caring and providing motivation have significant role on adherence.

2.1. Conceptual frame work

This conceptual frame work was developed after review of some literatures [38] [40] [41] [43] [48] [53] [44].

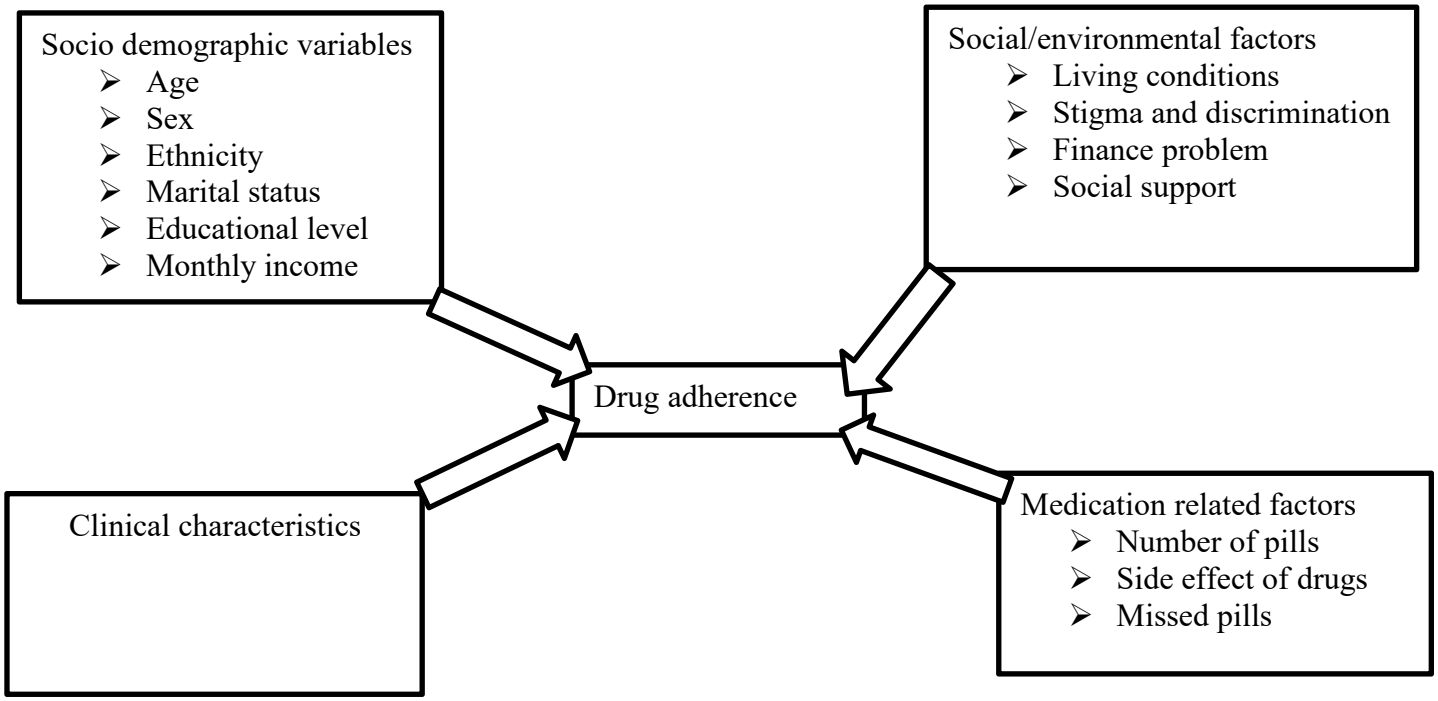

Figure 1: Conceptual framework of ART adherence.

CHAPTER THREE

3. OBJECTIVES

3.1. General objective

To assess drug adherence and its associated factors among HIV positive patients on ART at Gurage zone hospitals, SNNPR, Ethiopia 2021

3.2. Specific objectives

1. To assess the magnitude of drug adherence among patients who have ART follow-up in Gurage zone hospital, SNNPR, Ethiopia 2021
2. To identify factors for low drug adherence among patients who have ART follow-up in Gurage zone hospital, SNNPR, Ethiopia 2021

CHAPTER FOUR

4. METHODOLOGY

4.1. Study area

The study was conducted in Gurage zone hospitals, SNNPR of Ethiopia. Gurage is one of a Zone in the Ethiopian Southern Nations, Nationalities, and Peoples' Region (SNNPR) that located in 125-kilometer distance southwest from Addis Ababa. The zone is bordered on the southeast by Hadiya and Yem special woreda, on the west, north and east by the Oromia Region, and on the southeast by Silt'e. Gurage Zone has more than 10 woredas and two administrative cities (Wolkite and Butajira). More than 8 million peoples are live in this zone. There are about six hospitals found in Gurage zone, these are Butajira general hospital, Wolkite university teaching and comprehensive specialized Hospital (WKUTCSH), Atat primary hospital, Gunchre primary hospital, Bue primary hospital and Mehal Amba primary hospital. Among those, Atat primary hospital is a non-governmental hospital. But the remaining are a governmental hospital. There are about 1731 HIV positive patients who have ART follow up in Gurage zone hospitals (832 from Butajira general hospital, 16 from WKUTCSH, 405 from Atat primary hospital, 224 from Bue primary hospital, 123 from Mehal Amba primary hospital, and 131 from Gunchre primary hospital).

4.2. Study period

The study was conducted from July 1/2021 to July 30, 2021 consecutive days.

4.3. Study design

An institutional-based cross sectional study design was conducted.

4.4. Source population

The source population was comprised all HIV-positive patients following treatment at the ART clinics of Gurage zone hospitals.

4.5. Study population

The study population was a sampled HIV patient who had ART follow up at Gurage Zone Hospitals during the study period.

4.6. Eligibility criteria

4.6.1. Inclusion criteria

HIV-positive patients whose age greater than or equal to 18 years following their treatment at the ART clinics of Gurage zone hospitals during the time of data collection were included in the study.

4.6.2. Exclusion criteria

Patients who did not start ART, critically ill and unwilling to participate in the study were excluded from the study.

4.7. Sample size and sampling technique

4.7.1. Sample size

The sample size for this study was calculated by using a single population proportion formula, $n= (z^2 p (1-p))/d^{2,}$ by taking the proportion (P) of adherence to ART at 71.8% (P=0.718) from the previous study done in Hara town and its surroundings [46]. We also considered the margin of error 5% (d=0.05) at 95% confidence interval (1.96 CI).

Where:

n= Sample size

z= Confidence interval of 95% (1.96 CI)

P= Estimated population of adherence to ART = 71.8% (0.718)

d= Marginal error = 5% (0.05)

$n= (z^2 p (1-p))/d^2$

$n= (1.96)^2 (0.718) (1-0.718))/ (0.05)^2$

n=311

Then the result sample size was 311, by considering the non-respondent's rate of 10%, to calculate total sample size:

nf =n + (n x10%) = 311+ (311x 10%) = 342

Finally, a total of 342 ART patients were enrolled in the study.

4.7.2. Sampling technique

A systematic random sampling method was used to select study participants. First, the source population in each hospital was identified. During the time of data collection, there were a total of 1731 HIV-positive patients taking ART in Gurage zone hospitals. To obtain 342 study participants, a proportional allocation was made to each hospital. The sampling interval (K^{th}) for each hospital was determined by dividing the source population in each hospital into proportionally allocated samples in each hospital. For each hospital, the sampling interval (K^{th}) was 5. To obtain the first participant from 1 to 5, number 2 was randomly selected, and on each day of data collection, the second attending patient was the starting point of data collection. On each day of data collection, the second patient was taken as the first sample, and then every 5^{th} interval was taken to conduct an interview until the required sample size was acquired.

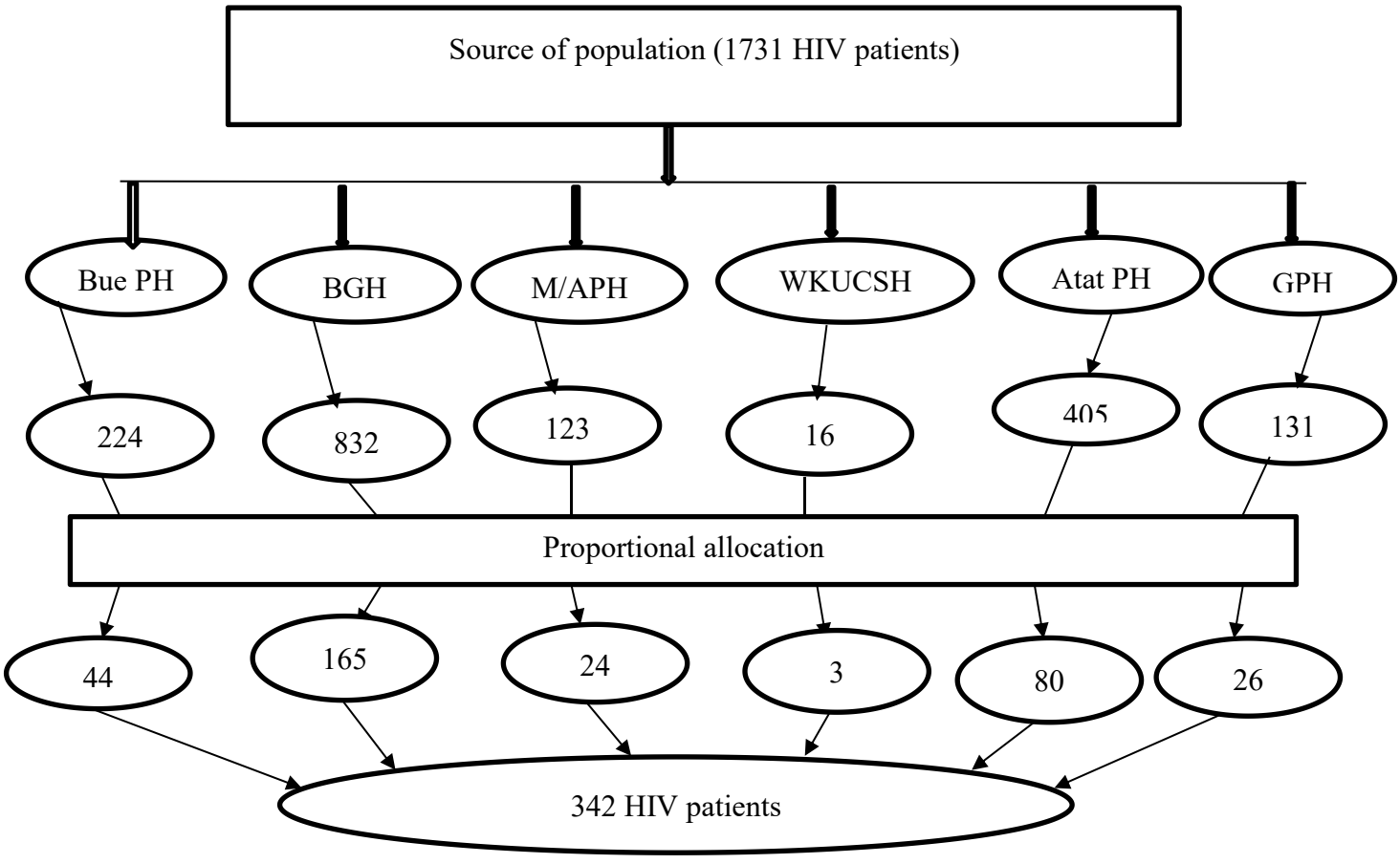

Figure 2: Schaech mapping presentation of sampling technique.

4.8. Study variables

4.8.1. Independent variables

- ✓ **Sociodemographic characteristics:** gender, age, marital status, ethnicity, educational status, residence, occupation, monthly income
- ✓ **Social/environmental factors:** Living conditions, Stigma and discrimination, Finance problem, Social support
- ✓ **Clinical and behavioral characteristics:** CD4 level, HIV stage, co-morbidity, disclosure status, duration of illness
- ✓ **Medication related characteristics:** ART side effect, number of pills, missed pills

4.8.2. Dependent variables

- ✓ Adherence to ART

4.9. Operational and term definition

- ➢.. **Adherence:** Is the extent to which clients' behavior coincides with the prescribed health care regimen as agreed up on through a shared decision-making process between the client and the health care providers.
- ➢.. **Good adherence:** Patients who reported an intake of ≥ 95% of the prescribed medication considered.
- ➢.. **Poor adherence:** Patients who reported an intake of < 95% of the prescribed medication.
- ➢.. **Good knowledge:** Those respondents who scored points 5-8 for the knowledge question prepared on HIV and its treatment.
- ➢.. **Poor knowledge:** Those respondents who scored points 0-4 for the knowledge question prepared on HIV and its treatment.
- ➢.. **Comorbidity:** The presence of any of the chronic disease along with HIV/AIDS.
- ➢.. **Poor social support:** Those respondents who scored points 3-8 for the assessment of family/social support question prepared on HIV and its treatment.
- ➢.. **Moderate social support:** Those respondents who scored points 9-11 for the assessment of family/social support question prepared on HIV and its treatment.
- ➢.. **Strong social support:** Those respondents who scored points 12-14 for the assessment of family/social support question prepared on HIV and its treatment.
- ➢.. **Perceived social stigma:** Those respondents who scored points at mean and above for the social stigma assessment scale question prepared on HIV and its treatment, otherwise not.

4.10. Data collection instrument and method

4.10.1. Data collection instrument

A structured questionnaire was developed after review of relevant literature's that were applicable for the same purpose. The instrument was grouped and arranged according to the particular objectives that they can address. The questionnaire had the following essential components: socio-demographic characteristics, clinical and social/behavioral related characteristics, assessment of side effect of ART, family/social support, perceived social stigma scale, knowledge about HIV and its treatment and level of adherence to ARV drugs; which are important to determine drug adherence and associated factors on ART among HIV positive patients in Gurage zone hospitals. Among those components of questionnaire Oslo 3-item social support scale was used to measure family/social support [55]. The 12 items short version of the HIV stigma scale was used to assess social stigma [56]. Disease/treatment knowledge was measured using tools which have eight questions taken from the previous similar study [57]. The questionnaire was first developed in English and then translated into Amharic during data collection, which is the national language, to make it clearer and easier to understand. The patient card also taken to find some information that is difficult to get it from patient itself.

4.10.2. Data collection method

The Data was collected by using a structured questionnaire through face to face interview and by taking patients card. Before data collection, three nursing students, which are under graduated were received an intensive training with each other. The training was given in Amharic on how to ask and fill the question, how to find some information from the card, selection criteria of HIV positive patients, and how to approach the patients/caretakers. Pretest was done on 5% of the total 342 sample size, which is 17, at Emdbir health center HIV positive out patients to check the validity of the questionnaire. Among components of the questionnaire the presence of adverse drug reaction was assessed by asking the patient whether he/she experienced any of the listed sign and symptoms in the last months. Patients who reported an intake of ≥ 95% of the prescribed medication were considered adherent; those with a reported intake of < 95% were classified as non-adherent [58].

$$\text{Adherence percentage} = \frac{\text{Number of pills taken during the specific period}}{\text{Number of pills to be taken during that specific period}} \times 100\%$$

4.11. Data processing and data analysis

4.11.1. Data processing

After the data collected, all items of the questionnaire were counted, cross checked and coded. The collected data was screened by all group members and checked its completeness before entry into analysis.

4.11.2. Data analysis

The data were entered into SPSS version 20 for analysis. Frequency was done to determine the percentage of each variable related to their category. Cross tabulation was also done to determine the relation of dependent and independent variables. The binary logistic analysis was conducted to measure the association between the dependent variable and independent variables p-value <0.25. All variables that had significant association at P<0.25 in bivariate logistic regression were moved into the multivariate logistic regression analysis and a significant association was considered at p<0.05 in order to identify factors that associated with patient adherence at p-value.

4.12. Data quality assurance

Data quality assurance was ensured during data collection, analysis, processing and documentation. One week before data collection, per-test was conducted by taking 5 % of study participants at Emdbir health center HIV positive out patients to check the validity of the questionnaire. After per-test, correction and amendment was done accordingly. Between the data collectors and supervisor discussion was done to prevent confusion and miss understanding. During data collection, the data collectors were instructed to use the check-list and code. So, that the errors were easily identified and corrected before analysis. The check list was checked for completeness by data collectors and supervisor.

4.13. Ethical considerations

An official letter, which was prepared by Wolkite University, College of Medicine and Health Science, Department of nursing, was informed for all administration offices of both hospitals to obtain permission. Confidentiality of the respondents was secured by excluding respondents' identifiers, such as names, from the data collection format. Informed written consent also obtained from the respondents before conducting the study.

CHAPTER FIVE

5. RESULT

Socio-demographic characteristics of participants

A total of 342 HIV infected peoples were participated in the study with the response rate of 100%. The mean age of participants was 34.88 (SD ± 9.517) years with a maximum age of 67 and a minimum age of 19. Among those participants 188 (55%) were female and 154 (45%) were male. Majority of the respondents, 174 (50.9%) were married. Concerning ethnicity, more than half of the respondents, 197 (57.6%) were Gurage. Among respondents 98 (28.7%) were educated up to secondary school. Majority of the respondents, 216 (63.2%) were lived in urban area and about 102 (29.8%) respondents were private workers. Regarding monthly income, 178 (52%) gets a monthly income of >2000 Ethiopian birr. 173 (50.6%) among participants had living companion. **(Table1).**

Table 1: Socio-Demographic Characteristics of Patients Who Were on ART at Gurage zone hospitals, southern Ethiopia, 2021

Character	Category	Frequency	Percentage
Sex	Male	154	45
	Female	188	55
	Total	342	100
Age	18-28	87	25.4
	29-38	155	45.3
	39-48	65	19
	>=49	35	10.2
	Total	342	100
Marital status	Married	174	50.9
	Single	96	28.1
	Divorced	44	12.9
	Widowed	28	8.2
	Total	342	100

Ethnicity	Gurage	197	57.6
	Amara	39	11.4
	Oromo	46	13.5
	Silte	32	9.4
	Others*	28	8.2
	Total	342	100
Educational status	No formal education	77	22.5
	Primary school	94	27.5
	Secondary school	98	28.7
	College and above	73	21.3
	Total	342	100
Residence	Urban	216	63.2
	Rural	126	36.8
	Total	342	100
Occupation	Government employee	68	19.9
	Private employee	102	29.8
	Farmer	26	7.6
	Merchant	61	17.8
	Others**	85	24.9
	Total	342	100
Monthly income	<500	15	4.4
	500-1000	43	12.6
	1001-1500	46	13.5
	1501-2000	60	17.5
	>2000	178	52
	Total	342	100
Living companion	Yes	173	50.6
	No	169	49.4
	Total	342	100

Note; *Tigre, Hadiya, Wolayta **Unemployed

Clinical and behavioral characteristics of participants

Majority of the study participants, 248 (72.5 %) had no co-morbidity of other chronic diseases. 282 (82.5%) of participants had knowledge about HIV and its treatment. More than half of the study participants, 284 (83%) had disclosed their HIV status to their family. Among participants, 133 (38.9%) had CD4 count between 200-500 cells and 107 (31.3%) had CD4 count between 501-800 cells. Regarding the stage of HIV, majority of respondents 212 (62%) were on stage I. More than half of study participants, 221 (64.6%) of the study participants had good family/social support and the other 104 (30.4%) had medium family/social support. Majority of the study participants, 227 (66.4%) don't experienced social stigma and the remaining 115 (33.6%) had experienced social stigma. 274 (80.1%) of the study participants had no history of current substance use. Concerning the disease duration, 150 (43.9%) had duration of 1-5 years, followed by 114 (33.3%) which was 6-10 years. Regarding the duration of treatment, 150 (43.9%) had been on the treatment for 1-5 years followed by 120 (35.1%) which was 6-10 years. Majority of the study participants, 191 (55.8%) had experienced an adverse drug reaction, and the remaining 151 (44.2%) had not experienced an adverse drug reaction. Concerning to waiting time for treatment, 214 (62.6%) of the study participants had waits for <30 minutes, and the remaining 128 (37.4%) had waits for >=30 minutes. **(Table2).**

Table 2: Distribution of study participants by clinical and behavioral characteristics among HIV/AIDS patients at Gurage zone hospitals, southern Ethiopia, 2021

Character	Character	Frequency	Percentage
Number of pills taken in a day	1 tablet	207	60.5
	2 tablets	47	13.7
	3 tablets	53	15.5
	>3 tablets	35	10.2
	Total	342	100
CD4 count	<200	36	10.5
	200-500	133	38.9
	501-800	107	31.3
	>800	66	19.3
	Total	342	100
Substance use	Yes	68	19.9
	No	274	80.1
	Total	342	100

Disease duration	<1 year	16	4.7
	1-5 years	150	43.9
	6-10 years	114	33.3
	>10 years	62	18.1
	Total	342	100
Treatment duration	<1 year	16	4.7
	1-5 years	150	43.9
	6-10 years	120	35.1
	>10 years	56	16.4
	Total	342	100
Comorbidity	Yes	94	27.5
	No	248	72.5
	Total	342	100
Family disclosure status	Yes	284	83
	No	58	17
	Total	342	100
Waiting time	<30 minutes	214	62.6
	>=30 minutes	128	37.4
	Total	342	100
Side effect of ARV drugs	Yes	191	55.8
	No	151	44.2
	Total	342	100
Family/social support	Good	221	64.6
	Medium	104	30.4
	Poor	17	5
	Total	342	100
Perceived stigma	Yes	115	33.6
	No	227	66.4
	Total	342	100
HIV stage	Stage I	212	62
	Stage II	91	26.6
	Stage III	28	8.2
	Stage IV	11	3.2
Knowledge about HIV and its treatment	Good	282	82.5
	Poor	60	17.5
	Total	342	100

Level of adherence to medication among the study participants

In this study, out of the total of 342 study participants 268 patients (78.4%) had adherence levels greater than or equal to 95% and were considered as adherent to ART, and 74 (21.6%) were not adherent to ART. **(Figure 3).**

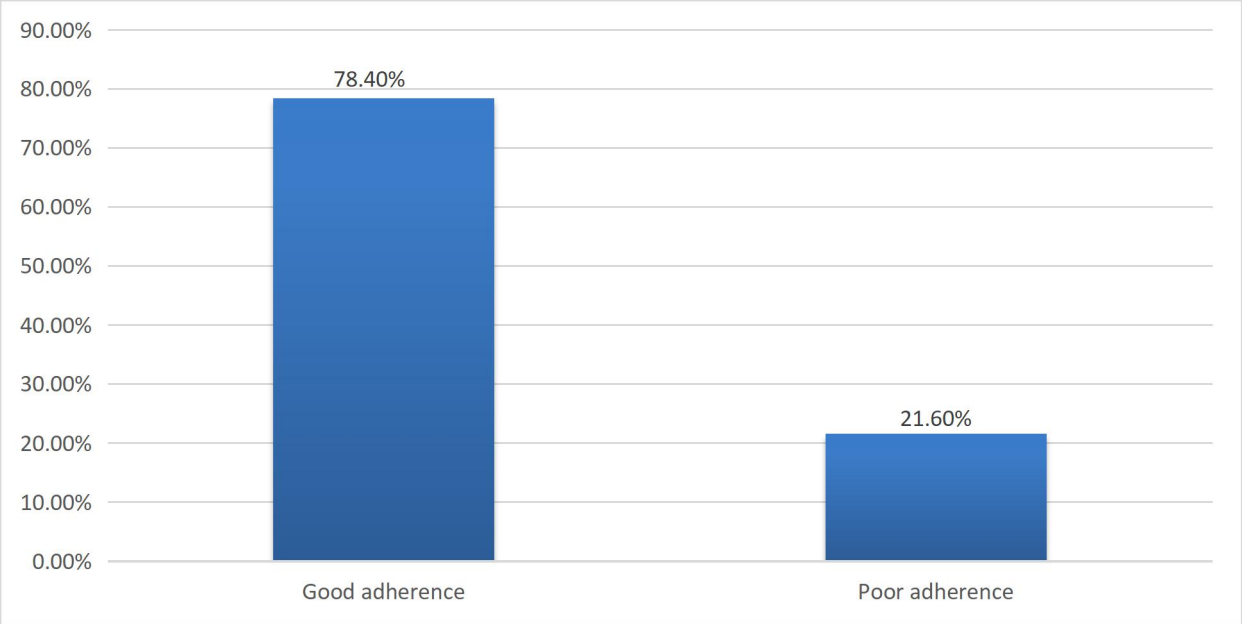

Figure 3: Bar graph showing the level of adherence to antiretroviral medication among HIV/AIDS patients at Gurage zone hospitals, Southern Ethiopia, 2021

Bivariate logistic regression analysis

In bivariate logistic regression, marital status, educational level, monthly income, number of pills taken in a day, CD4 count, substance use, comorbidity of other chronic diseases, waiting time, side effects of ARV medication, family/social support, perceived social stigma, knowledge about HIV and its treatment, and HIV stage were associated with ART drug adherence at P-value less than 0.25. **(Table3).**

Table 3: Bivariate logistic regression analysis of factors associated with adherence to antiretroviral medication among HIV/AIDS patients at Gurage zone hospitals, southern Ethiopia, 2021

Character	Category	Adherence to ART		COR 95% CI	p-value
		Good adherence (%)	Poor adherence (%)		
Sex	Male	120(35.1%)	34(9.9%)	1	
	Female	148(43.3%)	40(11.7%)	1.048(0.625, 1.758)	0.858
Age	18-28	72(21.1%)	15(4.4%)	0.800(0.267, 2.399)	0.690
	29-38	115(33.6%)	40(11.7%)	0.479(0.174, 1.319)	0.155
	39-48	51(14.9%)	14(4.1%)	0.607(0.199, 1.854)	0.381
	>=49	30(8.8%)	5(1.5%)	1	
Marital status	Married	144(42.1%)	30(8.89%)	1	
	Single	71(20.8%)	25(7.3%)	0.592(0.324, 1.080)	0.088
	Divorced	37(10.8%)	7(2%)	1.101(0.448, 2.704)	0.833
	Widowed	16(4.7%)	12(3.5%)	0.278(0.119, 0.647)	0.003[aa]
Educational level	No formal education	70(20.5%)	7(2%)	2.167(0.812, 5.781)	0.123
	Primary school	63(18.4%)	31(9.1%)	0.440(0.211, 0.921)	0.029[aa]
	Secondary school	75(21.9%)	23(6.7%)	0.707(0.330, 1.511)	0.370
	College and above	60(17.5%)	13(3.8%)	1	
Residence	Urban	172(79.6%)	44(20.4%)	1.221(0.721, 2.069)	0.457
	Rural	96(76.2%)	30(23.8%)	1	
Occupation	Government employee	53(78%)	15(22%)	1	
	Private employee	73(71.5%)	29(28.5%)	0.712(0.348, 1.459)	0.354
	Farmer	22(84.6%)	4(15.4%)	1.557(0.464, 5.219)	0.473
	Merchant	48(78.7%)	13(21.3%)	1.045(0.452, 2.418)	0.918
	Others**	72(84.7%)	13(15.3%)	1.567(0.688, 3.570)	0.284
Monthly income	<500	12(3.5%)	3(0.9%)	1.435(0.388, 5.310)	0.588
	500-1000	39(11.5%)	4(1.2%)	3.498(1.186, 10.318)	0.023[aa]
	1001-1500	35(10.2%)	11(3.2%)	1.142(0.537, 2.429)	0.731
	1501-2000	51(14.9%)	9(2.6%)	2.033(0.929, 4.449)	0.076
	>2000	131(38.3%)	47(13.7%)	1	
Living companion	Yes	137(40.1%)	36(10.5%)	1	
	No	131(38.3%)	38(11.1%)	0.906(0.541, 1.516)	0.707

Number of pills taken in a day	1 tablet	184(53.8%)	23(6.7%)	3.667(1.591, 8.451)	0.002[aa]
	2 tablets	25(7.3%)	22(6.4%)	0.521(0.209, 2.219)	0.162
	3 tablets	35(10.2%)	18(5.3%)	0.891(0.358, 2.219)	0.805
	>3 tablets	24(7%)	11(3.2%)	1	
CD4 count	<200	27(7.9%)	9(2.6%)	1	
	200-500	93(27.2%)	40(11.7%)	0.775(0.334, 1.796)	0.552
	501-800	97(28.4%)	10(2.9%)	3.233(1.194, 8.758)	0.021[aa]
	>800	51(14.9%)	15(4.4%)	1.133(0.439, 2.927)	0.796
Substance use	Yes	40(11.7%)	28(8.2%)	0.288(0.162, 0.514)	0.000[aa]
	No	228(66.7%)	46(13.5%)	1	
Disease duration	<1 year	13(3.8%)	3(0.9%)	1.150(0.285, 4.645)	0.845
	1-5 years	121(35.4%)	29(8.5%)	1.107(0.532, 2.305)	0.786
	6-10 years	85(24.9%)	29(8.5%)	0.778(0.370, 1.634)	0.507
	>10 years	49(14.3%)	13(3.8%)	1	
Treatment duration	<1 year	13(3.8%)	3(0.9%)	1	
	1-5 years	121(35.4%)	29(8.5%)	0.963(0.257, 3.601)	0.955
	6-10 years	91(26.6%)	29(8.5%)	0.724(0.193, 2.719)	0.633
	>10 years	43(12.6%)	13(3.8%)	0.763(0.188, 3.096)	0.705
Comorbidity	Yes	51(14.9%)	43(12.6%)	0.169(0.097, 0.295)	0.000[aa]
	No	217(63.5%)	31(9.1%)	1	
Family disclosure status	Yes	218(63.7%)	66(19.3%)	0.528(0.239, 1.171)	0.116
	No	50(14.6%)	8(2.3%)	1	
Waiting time	<30 minutes	158(46.2%)	56(16.4%)	0.462(0.257, 0.828)	0.01[aa]
	>=30 minutes	110(32.2%)	18(5.3%)	1	
Side effect of ARV drug	Yes	141(41.2%)	50(14.6%)	0.533(0.310, 0.917)	0.023[aa]
	No	127(37.1%)	24(7%)	1	
Family/social support	Good	197(57.6%)	24(7%)	7.296(2.573, 20.692)	0.000[aa]
	Medium	62(18.1%)	42(12.3%)	1.312(0.469, 3.675)	0.605
	Poor	9(2.6%)	8(2.3%)	1	
Perceived stigma	Yes	65(19%)	50(14.6%)	1	
	No	203(59.4%)	24(7%)	6.506(3.712, 11.404)	0.000[aa]
Knowledge about HIV and its treatment	Good	244(71.3%)	38(11.1%)	1	
	Poor	24(7%)	36(10.5%)	0.104(0.056, 0.193)	0.000[aa]
HIV stage	Stage I	182(53.2%)	30(8.8%)	1	
	Stage II	64(18.7%)	27(7.9%)	0.391(0.216, 0.707)	0.002[aa]
	Stage III	15(4.4%)	13(3.8%)	0.190(0.082, 0.439)	0.000[aa]
	Stage IV	7(2%)	4(1.2%)	0.288(0.080, 1.046)	0.058

Notes [aa]significantly associated at p<0.25 in bivariate analysis

****Unemployed**

Multivariate logistic regression analysis

In multivariate logistic regression analysis educational level, monthly income, number of pills taken in a day, Side effect of ARV drug, perceived social stigma, knowledge about HIV and its treatment, and WHO HIV staging were significantly associated with adherence to medication. From multivariate logistic regression analysis, patient having ARV drug side effect was 68% less likely adhere to ART (AOR=0.328; 95% CI: 0.130, 0.830) than those who have no ART drug side effect. respondents having average monthly income 1501-2000 were 6 times more likely adhere to ART (AOR=6.195; 95% CI: 1.486, 25.822) than those having monthly income those<1501. Regarding to educational level, respondents who were Primary school had 76% times less likely compared to those respondents with college and above (AOR=0.241; 95% CI: 0.072, 0.809). Respondents who take one tablet per day were 26.9 times more likely to adhere to their ART medication when compared to respondents who take more than three tablets per day (AOR=26.959; 95% CI: 5.167, 140.660). On the other hand, study participants who didn't perceived social stigma were 7.2 times more likely to adhere to their ART than those who perceived social stigma (AOR=7.269; 95% CI: 2.290, 23.074). Respondents who had poor knowledge about HIV and its treatment were 90% times less likely to adhere to their drug than those who had good knowledge about HIV and its treatment (AOR=0.104; 95% CI: 0.028, 0.391). **(Table4).**

Table 4: Multivariate logistic regression analysis for factors associated with adherence to antiretroviral medication among HIV/AIDS patients at Gurage zone hospitals, southern Ethiopia, 2021

Character	Category	Adherence to ART		A0R 95% CI	p-value
		Good adherence (%)	Poor adherence (%)		
Marital status	Married	144(42.1%)	30(8.89%)	1	
	Single	71(20.8%)	25(7.3%)	0.879(0.297, 2.603)	0.816
	Divorced	37(10.8%)	7(2%)	2.252(0.487, 10.424)	0.299
	Widowed	16(4.7%)	12(3.5%)	0.346(0.062, 1.929)	0.226
Educational level	No formal education	70(20.5%)	7(2%)	0.832(0.156, 4.442)	0.830
	Primary school	63(18.4%)	31(9.1%)	0.241(0.072, 0.809)	0.021**
	Secondary school	75(21.9%)	23(6.7%)	0.596(0.165, 2.144)	0.428
	College and above	60(17.5%)	13(3.8%)	1	

Monthly income	<500	12(3.5%)	3(0.9%)	1.115(0.128, 9.692)	0.921
	500-1000	39(11.5%)	4(1.2%)	0.578(0.118, 2.837)	0.500
	1001-1500	35(10.2%)	11(3.2%)	0.442(0.111, 1.761)	0.247
	1501-2000	51(14.9%)	9(2.6%)	6.195(1.486, 25.822)	0.012**
	>2000	131(38.3%)	47(13.7%)	1	
Number of pills taken in a day	1 tablet	184(53.8%)	23(6.7%)	26.959(5.167, 140.660)	0.000**
	2 tablets	25(7.3%)	22(6.4%)	1.153(0.253, 5.244)	0.854
	3 tablets	35(10.2%)	18(5.3%)	2.532(0.649, 9.879)	0.181
	>3 tablets	24(7%)	11(3.2%)	1	
CD4 count	<200	27(7.9%)	9(2.6%)	1	
	200-500	93(27.2%)	40(11.7%)	1.007(0.269, 3.763)	0.995
	501-800	97(28.4%)	10(2.9%)	2.564(0.505, 13.006)	0.256
	>800	51(14.9%)	15(4.4%)	0.372(0.071, 1.932)	0.239
Substance use	Yes	40(11.7%)	28(8.2%)	0.478(0.131, 1.744)	0.264
	No	228(66.7%)	46(13.5%)	1	
Comorbidity	Yes	51(14.9%)	43(12.6%)	4.337(0.984, 19.111)	0.052
	No	217(63.5%)	31(9.1%)	1	
Waiting time	<30 minutes	158(46.2%)	56(16.4%)	0.623(0.217, 1.792)	0.380
	>=30 minutes	110(32.2%)	18(5.3%)	1	
Side effect of ARV drug	Yes	141(41.2%)	50(14.6%)	0.328(0.130, 0.830)	0.019**
	No	127(37.1%)	24(7%)	1	
Family/social support	Good	197(57.6%)	24(7%)	1.893(0.356, 10.065)	0.454
	Medium	62(18.1%)	42(12.3%)	0.599(0.116, 3.088)	0.541
	Poor	9(2.6%)	8(2.3%)	1	
Perceived stigma	Yes	65(19%)	50(14.6%)	1	
	No	203(59.4%)	24(7%)	7.269(2.290, 23.074)	0.001**
Knowledge about HIV and its treatment	Good	244(71.3%)	38(11.1%)	1	
	Poor	24(7%)	36(10.5%)	0.104(0.028, 0.391)	0.001**
HIV stage	Stage I	182(53.2%)	30(8.8%)	1	
	Stage II	64(18.7%)	27(7.9%)	0.981(0.296, 3.246)	0.975
	Stage III	15(4.4%)	13(3.8%)	0.155(0.029, 0.812)	0.027**
	Stage IV	7(2%)	4(1.2%)	4.805(0.424, 54.475)	0.205

Notes **significantly associated at p<0.05 in multivariate analysis

CHAPTER SIX

6. DISCUSSION

The study aimed to assess drug adherence and its associated factors among HIV-positive patients on ART at Gurage zone hospitals, SNNPR, Ethiopia 2021. Based on WHO guidelines, patients who reported an intake of ≥95% of the prescribed medication were considered adherent and those with a reported intake of <95% were considered as non-adherent. Accordingly, this study identified that 78.4% of patients among study participants had adherence to ART, while the remaining 21.6% were not adherence to ART. This finding of level of adherence is consistent with the study done in Togo 78.4% [43]. However, these findings are low adherence level as compared to other similar studies done in Ethiopia: such as, Gondar (88.2%) [49], Northern Ethiopia, Tigray 94.84% [48], Gobba 90.8% [51], and South west Ethiopia 83.3% [53]. The finding was also lower than studies conducted in other countries like Nepal 87.4% [38], India 89.5% [39] and China 85.5% [40]. On the other hand, our finding is better than in studies done at Addis Ababa (Tikur Ambessa, Zewditu and St. Pauls' hospital) 73.3% [50], Hara town 71.8% [46], Nekemt 73.1% [52], South Ethiopia 68% [54], Northern Peru 41.7% [37], Egypt 27% [44] and Eastern Cape town 69% [42]. The difference might be due to variation in sample size, study setting, study design, and study participants. Another possible explanation for these variations may also the difference in socio cultural status, impact of the ART program over time in creating beneficiary awareness and care provider skill in the provision of counseling and the difference observed, like the method of adherence measurement. The level of adherence in this study is lower than the world health organization recommendation level [58].

In our study educational level was a factor which was associated with participants' adherence to ART medication. Odds of adherence among respondents who were Primary school had 76% times lower when compared to those HIV positive patients with college and above. Similarly, another study which was done in Southwest Ethiopia indicated that the odds of adherence among HIV positive patients who were unable to read and write were less likely compared to those patients with higher educational status. The possible reason might be those Patients with good educational status are better at receiving and adhering ART than those with less educational status [53].

With regard to average monthly income, patients whose average monthly income between 1501-2000 Ethiopian Birr, had positively associated to ARV medication adherence, 6.1 times more likely to adhere to ART than patients whose average monthly income >2000 Ethiopian Birr. However, many studies didn't show significant association between patient monthly income and ART medication adherence, Hara [46], Gondar [49], and Nekemt [52]. Patient monthly income has short- and long-term effects on HIV patient's adherence to ART related to fulfilment of their needs like transportation and food supply.

Studies conducted in India and Nekemt showed that number of tablets taken by the patient per day didn't showed significant association with adherence to ART medication [39] [52]. However, in this study numbers of tablets taken per day was significantly associated with ART adherence; respondents who take one tablet per day were more likely to adhere to their ART medication when compared to respondents who take more than three tablets per day. A patient may interest to take a single drug once easily without dropping it than more amounts of tablets. This finding isn't supported by other similar studied such as; Gobba [51], Gondar [49], Hara [46].

In this finding, Adherence to antiretroviral therapy was negatively affected by medication side effects. Respondents who had experienced drug side effect were less likely to adhere to their ART than those who hadn't experienced drug side effect. Incomparable to this, another study conducted in Hara, Ethiopia, showed that respondents who had not encountered drug side effect were more likely to adhere to their ART medication than those who had experienced drug side effect [46]. Similarly, study done in Chit wan, Nepal, reported that the odds of adherence among those who did not experience drug side effects were higher than those who reported experiencing drug side effects [38]. This might be due to the fact that study participants might skip their medication to avoid drug side effects. The severity of drug side effects varies from mild to life threating condition.

The finding of this study also showed that patient's level of adherence had negatively affected by perceived social stigma, respondents who didn't perceived social stigma were more likely to adhere to their ART than those who perceived social stigma. Non-stigma activity or Support from family and other members can have immediate and long-term positive influences on their adherence. However, study done in Nekemt didn't show any significant association between patients perceived social stigma status and ART medication

adherence [52]. This finding also didn't support by other many studies done in Northern Peru [37], India [41], Gobba [51], Gondar [49], Hara [46], Northern Ethiopia [48], and Southern Ethiopia [54].

In this study, participants who had knowledge about HIV and its treatment were positively associated with their drug; study participants who had poor knowledge about HIV and its treatment were less likely to adhere to their drug than those who had good knowledge about HIV and its treatment. This is due to the fact that knowledge of HIV and its treatment might increase their awareness and access to HIV therapy. This finding is consistent with the study done in Nekemt [52], but not supported by many other studies like Eastern Cape [42], South Sudan [45], Gobba [51], Hara [46], Southern Ethiopia [54], and Southwest Ethiopia [53].

A study from Nekemt and Hara indicated that WHO clinical staging was not associated with patient medication adherence [52] [46]. Reverse to this, our study showed that WHO clinical staging had significantly associated with adherence to ART medication; the odds of adherence among patients with WHO clinical staging III were lower than those with WHO clinical staging I. A possible reason for this association might be those patients whose WHO clinical staging III hasn't take their medication correctly than those whose WHO clinical staging I due to fear and stigma as a result of external manifestation of the disease process. This is supported by studies done in Northern Ethiopia and South West Ethiopia [48] [53]. Unlike other studies done in different parts of the world, marital status, waiting time, CD4 count, comorbidity to other chronic disease, family/social support and substance use didn't show significant association with ART adherence in this study.

CHAPTER SEVEN

7. CONCLUSION AND RECOMMENDATION

7.1. Conclusion

In this study, the level of adherence to antiretroviral therapy was found low compared to the WHO recommendation. Educational level, monthly income, number of pills taken in a day, ARV drug side effect, perceived social stigma, knowledge about HIV and its treatment were significantly associated to ARV medication. Among those factors having educational level of primary school, having ARV drug side effect, poor knowledge about HIV and its treatment, and HIV staging III were negatively associated with good ART drug adherence. Whereas, average monthly income, one tablet taken in a day, and having no perceived social stigma were positively associated with good ART drug adherence.

7.2. Recommendation

- ✓ Health care providers should provide accessible information to patients on their treatment plan to ensure patients keep their regular follow up, improve their patient's confidence and to avoid drug abuse.
- ✓ The clinicians need to improve relationship with their patients and counsel their patients on the regular follow up of the appointments and avoiding drug abuse.
- ✓ The clinician should focus on adverse drug reactions.
- ✓ Instead of dropping out their medication, it is recommended to get a consultation with the healthcare providers to manage the adverse consequence of the ARV drugs.
- ✓ The community should avoid any sign of stigma surrounding to the HIV patients.

Strength and Limitation of the study

Secondary data, patients' card, was used to identify the clinical markers in addition to primary data and the study covers all hospitals that found in Gurage zone. However, the study was quantitative study and it did not assess the factors that affected adherence through qualitative study. Therefore, a qualitative study is recommended. This study identified only associated factors with the adherence and it did not assess causality. Therefore, instrumental variable analysis is recommended to illustrate causality and improve the management of HIV-positive patients.

References

1. The joint United Nation program on HIV/AIDS. Global report: UNAIDS report on the global AIDS epidemic 2012.

2. Granich, Reuben & Gupta, Somya & Williams, Brian. (2018). 90-90-90, Epidemic Control and Ending AIDS: Global Situation and Recommendations. International Journal of Virology and AIDS. 5. 10.23937/2469-567X/1510043.

3. UNAIDS 90–90–90 an ambitious treatment target to help end the AIDS epidemic.http://www.unaids.org/en/resources/documents/2014/90-90-90

4. Hill A, Pozniak A. HIV treatment cascades: How can all countries reach the UNAIDS 90-90-90 target? 2015. AIDS 29: 2523–2525. https://doi.org/10.1097/QAD.0000000000000864 PMID: 26558548

5. Santiago et al. effectiveness of HAART in Spanish charts of HIV sero converted. AIDS 2007; 17(3): 354.

6. Drug Administration and Control Authority. Standard treatment guide lines for zonal hospital. HIV/AIDS. 1st edition 2010; P1-4.

7. Feyissa, Garumma & Nigussie, Aderajew & Demissew, Tariku & Woldie, Mirkuziew & Morankar, Sudhakar. (2013). Structural barriers to Highly Active Antiretroviral Therapy (HAART) adherence: a systematic review protocol. jbi database of systematic reviews and implementation reports. 11. 216 - 224. 10.11124/jbisrir-2013-661.

8 R. C. Vreeman, S. E. Wiehe, E. C. Pearce, and W. M. Nyandiko, A systematic review of pediatric adherence to antiretroviral therapy in low- and middle-income countries, Pediatric Infectious Disease Journal , vol. 27, no. 8, pp. 686–691, 2008.

9. WHO. Antiretroviral therapy. Geneva: WHO. Available from: https://www.who.int/hiv/topics/treatment/art/en/. Accessed May 22, 2020

10. Do HM, Dunne MP, Kato M, Pham CV, Nguyen KV. Factors associated with suboptimal adherence to antiretroviral therapy in Viet Nam: a cross-sectional study using audio computer-assisted self-interview (ACASI). BMC Infect Dis. 2013; 13: 154. doi: 10.1186/1471-2334-13-154