FACTORS DETERMINING NON-ADHERENCE TO DRUG TREATMENT AMONG TUBERCULOSIS PATIENTS IN HALABA SPECIAL DISTRICT: A CASE-CONTROL STUDY

BY:

MUHAMMAD AHMED RAMETO (BSC)

A THESIS REPORT SUBMITTED TO DEPARTMENT OF EPIDEMIOLOGY, COLLEGE OF PUBLIC HEALTH AND MEDICAL SCIENCES, JIMMA UNIVERSITY, AS PARTIAL REQUIREMENT FOR THE DEGREE MASTER OF PUBLIC HEALTH IN EPIDEMIOLOGY.

JUNE, 2014

JIMMA, ETHIOPIA

DEPARTMENTS OF EPIDEMIOLOGY

COLLEGE OF PUBLIC HEALTH AND MEDICAL SCIENCES

JIMMA UNIVERSITY

Factors Determining Non-Adherence to Drug Treatment Among Tuberculosis Patients In Halaba Special District: Case- Control Study

Advisors

1. Professor Kifle Woldemichael (MD, MPH).
2. Wondwossen Kassahun (PHD)

June, 2014

Jimma, Ethiopia

[1]**ABSTRACT**

Background: Adherence is defined as the extent to which patients take anti-TB drugs as prescribed by their health care providers for the entire length of time. Non-adherence is the patient's inability or refusal to take anti-TB drugs as prescribed by health professionals. Non-adherence to anti-tuberculosis treatments increases the risks of morbidity, mortality and multi drug resistance TB (MDR-TB) at both the individual and community levels.

Objective: To identify factors that determine non-adherence to anti-TB treatment among TB patients in Halaba special district 2014.

Methods: Multi facility based Unmatched Case control study was conducted in eight-health facilities (seven-health center and one primary hospital) on 166 cases and 166 controls were participated to assess predisposing factors that associated with non-adherence to anti-TB treatment among TB patients from 2-27 March 2014. Both cases and controls were selected from TB registration books. Socio demographic, patient related factors, health facility related factors and health care provider related factors were assessed using structured questionnaires. Finally, the data were entered Epidata virsion3.5.1database and analyzed using SPSS windows version 16. Descriptive statistics was performed to measure summery of data. Binary logistic regression analysis was conducted to see the association between independent and dependent variables. Those significant variables in bivariate analysis were entered to multivariable logistic regression and final model was constructed.

Result: Males constitute 84(50.6%) of the cases and 96 (57.8%) of controls. Major pre disposing factors to anti-TB treatment non-adherence were, anti-TB drug side effect, (AOR=5.46,95%, CI:2.03-14.63), Pills burden, (AOR=5.09,95% CI:2.94-8.82), Feeling better, (AOR=4.04,95% CI:1.48-11.04) and lack of service satisfaction(AOR=3.27,95% CI:1.71-6.26).
Conclusion: The major risk factors for non-adherence among the study participants were anti-TB drug side effect, pills burden, feeling better, lack of service satisfaction, being female, and lack of safe water access.

Key words **Non-Adherence to Drug Treatment , in Halaba special district(SNNPR).**

ACKNOWLEDGEMENTS:

My special gratitude and appreciation goes to my advisors Professor Kifle Woldemichael (MD, MPH) Director, Horn of Africa Resilience Innovation Lab, RAN Principal Investigator, Monitoring and Evaluation Training Program Focal Person, One Health Ethiopia and Wondwossen Kassahun (PHD) for their unreserved encouragements and provision of constructive comments and guidance.

I deeply thank all the respondents and the data collectors, supervisors and Halaba special district health office head Haji Nuriye for his coordination for data collection, Kulito Hospital staffs and other health facilities TB focal persons for their co-operation during the study periods. My heartfelt gratitude also goes to Jimma University for giving me this golden and educative opportunity.

Finally, I would like to thank my wife, Rahma Adam, my mother Mariym Mussa and my brother Selman Ahmed for their unreserved support throughout the two-year study periods.

Table of Contents

List of tables

List of figures

LIST OF ABBREVIATIONS

AFB: Acid-Fast Bacilli

AIDS: Acquired immune deficiency syndrome

DOTS: Directly Observed Therapy Short Course

E: Ethambutol

EPTB: Extra-Pulmonary Tuberculosis

H: Isoniazid

HEW: Health extension worker

HIV: Human Immunodeficiency Virus

M: Mycobacterium

MDG: Millennium development goal

MDR: Multi Drug Resistance

FMOH: Federal Ministry of Health

NTG: National Tuberculosis Guideline

PTB: Pulmonary Tuberculosis

R: Rifampicin

S: Streptomycin

SPSS: Statistical Package for Social Science

TB: Tuberculosis

WHO: World Health Organization

Z: Pyrazinamide

HBC: High burden count

SNNPR: Southern Nations and Nationality

COR: Crude odds ration

AOR: Adjusted odds ratio

CHAPTER 1: INTRODUCTION

1.1 BACKGROUND

Tuberculosis (TB) is a chronic infectious disease caused by Mycobacterium tuberculosis (MTB).Typically it affects the lungs but also other parts of the body. It is transmitted via infectious droplet when people with pulmonary TB expel the bacilli while coughing, sneezing, talking. In general, a relatively small proportion of people infected with M. tuberculosis will develop TB disease however, the probability of developing TB incidence is much higher among people infected with HIV. Tuberculosis bacillus (TB) is also more common among men than women and affects mostly adults in the economically productive age groups. The most common method for diagnosing TB worldwide is sputum smear microscopy (developed more than 100 years ago) in which bacteria are observed in sputum samples examined under a microscope[1].

According to WHO Global TB Report 2013, globally there were 8.6 million incident cases and 1.3 million deaths from TB including HIV positive, in 2012. Africa covers 27% of global TB incident next to South-East Asia, which accounts 58%. Different studies were done on natural history of TB stated that among those who infected with pulmonary tuberculosis, 70% of them will die within 10 years, if they did not treated[1]. Without treatment, TB mortality rate is high. In studies of the natural history of the disease among sputum smear positive or HIV-negative cases of pulmonary TB, around 70% died within 10 years, among culture-positive cases, 20% died within 10 years[1]. The number of TB deaths is unacceptably large given that most are preventable if people can access health care for a diagnosis and the right treatment is provided. Short-course regimens of first-line drugs that can cure around 90% of cases[1].

According to WHO global reports 2013, Ethiopia ranks 8^{th} in the list of 22 high burden countries (HBCs), and 3^{rd}in Africa (next to Nigeria and South Africa), with an estimated prevalence of all forms of TB 394 per 100,000 populations[2].

As Ethiopian national TB guideline, during initial phase of treatment all new cases of TB are treated with short-course chemotherapy comprising two months on Rifampicin, Ionized, and Pyrazinamide (RHZ) plus Ethambutol or Streptomycin[3]. During intensive phase, health care providers directly observe patients for consecutive two months while they are taking daily treatment and that followed by a continuation phase of four months on EH, at which time drugs for self-administered treatment are to be collected every week and subsequently it endorsed by the WHO Stop TB Strategy in 2006[2-4].

However, WHO established DOTs strategy for improving treatment adherence. Long duration of treatment regimen and lack of awareness about treatment benefits patients interrupt and stop their medications prior to completions of treatment. Interrupt and stop treatment create a complex problem for effective control of TB[5].

Adherence to treatment means a patient is following the recommended course of treatment by taking all the prescribed medications or doses for the entire length of time without any missing. Non-adherence is the patient's inability or refusal to take TB drugs as prescribed by health professionals, Anti-TB treatment will be cure 90% of TB cases if patients adhere to their TB treatment regimen without any interruptions. Adherence is pillar for improving treatment outcomes, to avert mortality, morbidity and other related problems that directly or indirectly affect the community health[6].

The three category of non-adherences, primary non adherence that indicates that patient may not fill drugs that were prescribed by health professionals or patients fill their drug but did not initiate, non-persistence non-adherence, patients initiate their drug but stop it without completions, non-conformations non-adherence, that mean patient may skip dose or take incorrect doses[7].

There are different factors that influence treatment adherence, these factors generally grouped as patient related, health facility related and health care provider related factors. In addition, social environments also contribute its influence to non-adherence to medications. Non-adherence to anti TB treatment is one possible reason for developing emergency of multi drug resistance TB (MDR-TB) and XMDR-TB, treatment failure and relapsing cases [8].

MDR-TB and XDR-TB disease further reinforces the absolute necessity of helping TB patients to adhere to drug regimen and that need sophisticated diagnosis including its treatment. In the Stop TB Strategy, supervision and patient support remains the corner stone of DOTS for adherence to anti-TB and help to achieve treatment success target by 85% as it stated in MDG goal[9].

1.2 Statement of the Problem

Non-adherence to anti Tuberculosis (TB) treatment is a problem that promotes prolonged infections among the community and results in treatment failure to patient. Incomplete anti-tuberculosis treatment is the reason for emergence of multi-drug resistant strains of TB (MDR-TB) and for development of very drugs-resistant strains or extensively drugs-resistant (XMDR-TB) strains [10].Failure to adhere to recommended medication regimens is one of challenges that lead for adverse consequences treatment outcomes among patients. Many studies reported that diverse outcomes such as treatment failure and development of MDR-TB are associated with non-adherence[7, 10].

Globally in 2012, an estimated 450, 000 people developed MDR-TB and there were an estimated 170 000 deaths from MDR-TB, non -adherence to anti TB medication was one of possible reason for this devastating problem. Different studies indicate that, out of all medication-related hospital admissions in the United States, 33% to 69% patients were admitted due to non-adherence to their medication according to health care providers, which expenses approximately $100 billion a year[7, 11].

Some researchers in the behavioral sciences revealed that cohort of patients could be segmented according to level-of-readiness to follow health care provider recommendations. Lack geographical access to health facility ,financial burden, low awareness about treatments were risk factors that influence patient readiness to follow prescribed treatment and recommendations are the most challenges for achieving treatment success. Clinical trial studies that were done in different part of world indicate, average range of non-adherence rates for different chronic disease treatment regimen is 22% to 57% globally among patients[11].

Previous studies that were done in different parts of Africa including Ethiopia had shown that, anti-TB drug regimen takes longer period of time that influence treatment adherence among patients and that may lead to treatment failure, increase chance of development of MDR-TB incidences, prolong transmissions among community, increase health care costs [2, 5, 12]. Feeling batter from disease is one of risk factor that influence adherence to anti TB treatments among patients. During short-course regimen, first-line anti-TB drug treatment has a potency for rapidly removing 90% of symptoms and bacterial load for new cases that encourage patients to feel batter or cured from disease so that they did not continue their treatment to next phase [1, 13].

According to Ethiopian national TB survey in 2011, revealed that prevalence of MDR–TB is 11.8% for previously treated patients and 1.6% for newly diagnosed TB patient one of possible cause is due to non-adherence to their treatment[2]. Diagnosis and Treating MDR-TB patients in Ethiopian situation challenging because it need specialized hospitals in TB treatment like Gondar specialized hospital and Alert hospital in Addis Ababa to manage MDR-TB effectively. That indicates lack of such health facility for provision of diagnosis and treatment for those patients escalated further complicates of the situation in the country.

However, DOTS in SNNPR region is significantly attributable for deduction of defaulter from 38% to 18% still now one out of five patients are non-adherent for their treatment so that it is a critical problem for successful control of TB in the region[14]. According to Halaba special woreda health office reports, last ten (from 1993 up to 2003 EC) years ago all type of TB cases who diagnosed and initiated treatment were 2566,but only 1126(43.8%) adhered to treatments regimen. This shows that adherence to anti TB treatment is low as compared to previous study which revealed 77% in the region. Currently three confirmed MDR-TB cases and three treatments failure cases were reported from the district health office 2005 annual year reports. Studies that were conducted in different area of region (Sidama and Hadiya Zones) to identify predisposing factors but that may not represent Halaba special woreda due to geographical accessibility, socio-demographic, economic differences and duration of time that study elapsed.

CHAPTER 2: LITERATURES REVIEW

Over view: There are different risk factors that determine non-adherence among TB patients. Different studies tried to measure various pre disposing risk factors that enhance non-adherence to anti -TB treatments among patients. Accordingly, risk factors that influence adherence grouped in to four, such as socio-demographic factors, patient related factors , health facility related factors and health care provider related factors[15].

A study conducted in SNNPR to assess factors that influence TB treatment adherence at health institution level, revealed that distance to health facility, age of patient and lack of public transport had significant association with non adherence[14]. Additionally, poor interaction of service providers with patient or poor communication with patient, irregular supply of drugs or poor supply chain, poor patient counseling about drugs and its side effect, the inevitable tendency of patients to forget drug intake and stop treatment when they feeling better had association with non-adherences among patients[14-16]. Anti-TB medication side effect, pills burden especial for HIV positives patients and low-income other common challenges that influences adherence [17, 18].

2.1 Socio demographic characteristic

Different studies conducted in different setting of Ethiopia, India, and china indicates that age of patient, illiteracy and being males had significant association with non-adherence among TB patients [14, 19]. According to study that conducted in SNNPR reported that, patient whose age was greater than twenty five years, significantly associatied with non-adherence[14]. Study report from was in India revealed that factors which independently associated with non-adherence were illiteracy and having other commitments during treatment [20]. Similarly, study from India non-adherence to anti-TB drug treatment was 2.5 times more likely among males as compared to females and conversely it was also significantly higher among female who were commercial sex workers[21]. In addition to these, nested case control study conducted in six states of India showed illiteracy was one of the barriers that associated with non-adherence to anti TB drugs treatment[20]. A assessing adherence to anti-TB drug therapy in Tanzania revealed that female patients were twice more likely to be adherant to treatment as compared to

male patients[22]. A study conducted in Eastern region of Ghana stated that non adherence was about four times higher among male patients than female patients and it is associated with non-adherence [23]. A cross sectional study conducted to determine adherence among tuberculosis patients in China reported that primary education is significantly associated to adherence compared to no formal education.

2.2 Patients health and behavioral related factors that determine non-adherence

Studies conducted in China and India reported that drug side effect was one potential risk factor that influences patients behavior to acceptance anti-TB medication and it was significantly associated with non-adherence[19, 20]. Other study that conducted in South Africa stated that, alcohol consumption, lack of adequate food, feeling better, homeless and feeling ashamed to disclose their disease to their friends were factors that associated with non-adherence among TB patients[24]. Different studies conducted in Ethiopia, Kenya, Cameron and Nigeria stated that patients who co-infected with HIV are more likely to be non-adherent to anti-TB treatment, since pill burden may be possible reason for their missing of treatment [16, 25-27]. Similarly , study report from Uganda conformed that, con-infection with HIV and ART drug users, smoking and alcohol consumption were risk factors independently associated with non-adherence[10]. Qualitative study conducted in Addis Ababa stated that TB patients unemployment was one of interrelated barriers for adherence among TB patients[28]. Other predisposing factors that independently associated with non-adherence was lack of money for basic need expenses also reported from studies that were done in Ethiopia, China, and India[15, 19, 20]. Knowledge about treatment benefit and side effect has great contributions for adherence in TB control program. Previous study that was conducted in Arsi zone reported that adequate knowledge and family supports were found to be possible protective factors for treatment non-adherence[29]. Other cross sectional study conducted in Tanzania established that sharing of cups as a means of transmitting TB was reported by 27.3% of males and 17.2% of females and the difference was statistically significant ($p < 0.003$) [22]. China is the first country in the world by TB prevalence accordingly quantitative and qualitative study conducted to assess factors that affect treatment adherence among pulmonary TB patient in Jiangsu Province found that those who illiterate one

2.4 times more likely to be non-adherent as compared to literate one[19]. Meta analysis report from Canada identified that social support including transport and food had significant contribution for increasing treatment adherence among TB patient. In addition to that homeless individuals were more likely to be non-adherant for anti-medications[30].

2.3 Accessibility to health facility is barrier to anti-TB drug adherence

Different quantitative and qualitative studies done in different parts of Ethiopia identified that, multiple factors affect treatment adherence such as geographical accessibility, distance from home to nearest health facility, lack of public transportation to health facility and inconvenient hours to patients in line patients program grouped under health facility related factors[13, 31]. Lack of health facility accessibility for diagnosis and treatment is one of the predisposing factors that affects TB treatment adherence among patients. A prospective cohort study conducted in SNNPR(Southern Nations and Nationality) region confirmed that distance was associated with non-adherence[14]. A cross sectional study conducted in Eastern region of Ghana stated that defaulting from TB treatment was associated with distance that patient traveled to nearest facility to get anti TB treatment[23]. A study in South India identified that non-adherence was associated with difficulties in accessing health facility to get treatment medication for TB and it is associated with non-adherence among TB patients[32]. Poor communication of health care providers with patients was identified as risk factor for anti TB treatment and it has significant association with non-adherence. A prospective cohort study conducted in India reported that patients who face poor interaction with their service provider were 1.72 times more likely to be non-adherent as compared to those who have good communications with their care providers[20]. In addition to these, similar study that was conducted in Gahanna stated that those who face poor interaction with their service provider were 2.72 times more likely non-adherent compared to those who have good communications with their care providers[23].

2.4 Health care provider related factors

The quality of the relationship between health care provider and patient is critical to support adherence. Studies from Ethiopia and Nigeria conformed that health care providers have decisive role to achieve expected adherence among TB patient [23, 30, 33]. Patient satisfaction to health care provider service associated with non-adherence ,study report from India indicate that non-adherence among dissatisfied one 1.73 times more likely than individuals who satisfied one[20].

2.5 Significance of the Study

In Ethiopia Non-adherence to anti tuberculosis is more prevalent since different socio economic factors and cultural related factors that prohibit patients to be adherent for anti TB drug treatments[16]. Current study was identified potential risk factors that associated with non-adherence among TB patients in the district (woreda) and based on the findings appropriate control planes and collaborative holistic prevention mechanism will be developed to enhance adherence among TB patients. Also this finding will have significant roles in controlling the spread of the MDR-TB disease in the region, decreasing mortality and prolonged TB transmission to community. It will also serve, as base line to those who conduct further study in the district as well as in the region and it will give additional information about risk factors for non-adherence to SNNP health bureau.

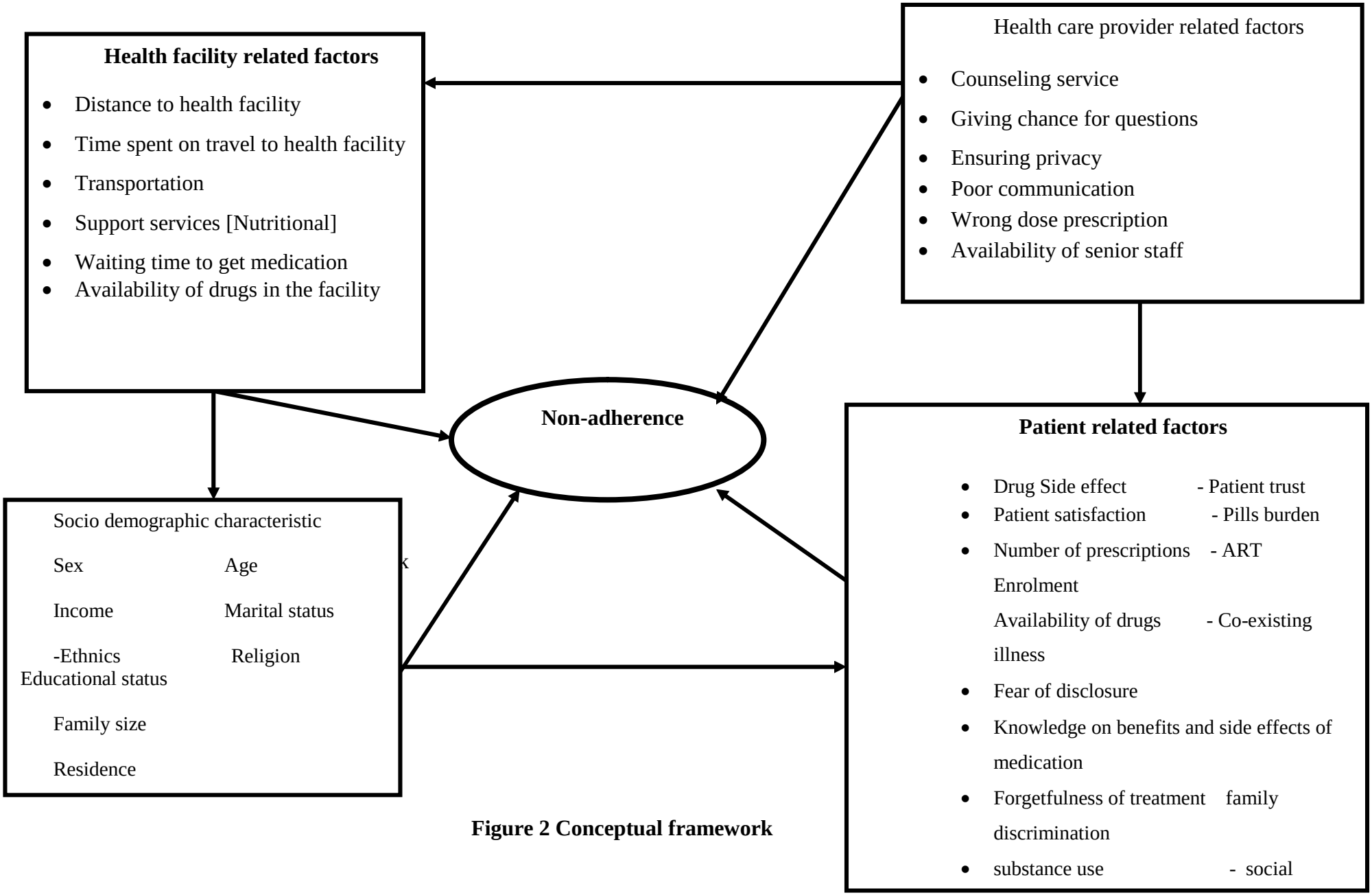

Figure 2 Conceptual framework

CHAPTER 3: OBJECTIVES

3.1 General Objective

The main objective of this study was to assess factors that determining non-adherence to drug treatment among tuberculosis patients in Halaba special district 2014.

3.1.2 Specific Objectives

1) To identify association between socio-demographic factors and non-adherence among TB patients
2) To identify patient related factors that associated to non -adherence among TB patients.
3) To determine health care provider related associated to non-adherence among TB patients.
4) To identify health facility related factors that associated to non-adherence among TB patients.

CHAPTER 4: METHOD AND MATERIALS

4.1 Study Area

The Study conducted from 2 March to 27/2014 in Halaba special district. The district is found in Southern Nation Nationality and People's Region (SNNPR), 92 km away from regional city, Hawassa to the west direction and 315km away from Addis Ababa. The district is bounded by Silte zone from the north, Kambata zone from south-west, Arsi zone from east & Hadiya zone from west. The district has 79 rural, seven urban administrative kebeles (small administrative units), with town administration. The district has one primary hospital and ten health centers with 79 satellite health posts. All health centers were equipped medically (essential medical supplies and medical equipments) and there were 158 health extension workers (HEW) at all rural kebeles levels (2 HEW per Keble). Each health posts had household (family folder) that consists of number of households in the kebeles including each household family size, under five year children, pregnant mothers and other demographic related issues. It is updated two times per year by HEWs and that is used as base line for planning purpose in the kebeles for every health related program. The district has 450,000 populations, male constitute 49% rest ones constitute by females. Health potential service coverage was 95% and DOTs program initiated in all health facilities (in ten-health centers and in one primary hospital) in the district. All health institutions have TB DOTs program coordinators or focal persons. They have been trained in TB management to enhance treatment adherences among patients. The district has road access and network coverage including rural kebeles.

4.2 Study Design and study period

4.2.1 Study Design

Multi health facility based unmatched case control study was conducted.

4.3 Population

4.3.1 Source population

Definition of case and controls: TB patients who interrupt 10% or above dose of anti-TB treatment taken as cases or "non-adherent to anti-TB treatment" and TB patient who interrupt below 10% dose of anti-TB taken as "adherent to anti-TB treatment" [19].

4.3.1.1 Source population for cases

Source population for cases was all non-adherent TB patients who registered on DOTs from January 2012 to December 2013 in Halaba special district.

4.3.1.2 Source population for controls

Source population for controls was all adherent TB patients who registered on DOTs for treatments from January 2012 to December 2013 in Halaba special district.

4.3.2 Study populations

Both Cases and controls that fulfill the inclusion criteria were included in the study population from source populations.

4.3.3 Inclusion Criteria

1) New TB patients who started treatment and completed in eight health facilities (seven health centers and one primary hospital) from January 2012 to December 2013 were included in the study.
2) New TB Patients who transferred in from health facilities within district were included in the study.
3) All new patients whose age >15 years old registered and were on DOTS regimen from January 2012 to December 2013 included in the study.

4.3.4 Exclusion Criteria

Patient who was fulfill the following criteria during study period excluded from study:

1) Patient who was on treatment during study period
2) Patient who was registered as dead
3) Patient who had incomplete information
4) Patients who had started treatment but transferred out of the district

4.4 Sample Size and sampling procedures

4.4.1 Sample Size determination

The sample size was calculated using Epi-Info7.1.0.6 statistical software by assuming two-population proportion sample size statistical techniques. Distance considered as main exposure variable for the determination of the sample size from previous study that was conducted in SNNPR region was [14]. Prevalence of exposure variable in control group was 21.36% that give maximum sample size to detect odds ratio of 2.0 and Control to cases was 1:1 ratio with level of significance 0.05 at 95% CI and 80% power. Accordingly, the total sample size for this study was 360(180 controls or adherent and 180 cases or non-adherent).

4.4.2 Sampling procedures

Sample was selected from health facilities based national TB registration books in which eight health facilities, (kulito hospital, Ashoka heath center, Guba health center, Konicha health center, Tuka health, Beshano health center, Arsho health center and Halaba health center) selected due to their DOTs program was started before 2012. According to inclusion criteria sampling frame for both cases and controls was prepared, simple random sampling techniques was applied to select study subjects from sampling frames in each health facility. Finally, from each health facility, both cases and controls were randomly selected by using 1 to 1 ratio.

From Jan 2012 to December 2013, Six hundred eighty eight (688) all type of new TB, (pulmonary and extra pulmonary), patients were registered in selected health facilities. Based on exclusion criteria 79 patients were excluded from registration book, the remaining 609(223 cases and 486 controls) sampling population, that fulfill inclusion criteria. One hundred eighteen (180) cases from 223 sample population and one hundred eighteen (180) controls from 486 sample population were randomly selected.

4.5 Data collection

4.5.1 Measurements

Data were collected by using interviewer administered structured questionnaires and by reviewing national TB registrations books. The questionnaires were grouped in to different parts that includes socio demographic, knowledge about TB, medication related problems, psychosocial, miss use of different substances including chat and alcohol consumption, health facility related factors, social support and health professional related factors arranged to address particular objectives.

4.5.2 Variable

4.5.2.1 Dependent variable

Status of non-adherence to anti-TB drug treatment among TB patients

4.5.2.2 Independent Variable

1. **Socio demographic related factors are**

- Age
- Sex
- Area of residence
- House hold income
- Occupations
- Family size
- Educational status
- Ethnicity
- Family size
- Religion

2. **Patient related factors characteristic**

- Coexisting illness
- Fear of disclosure
- Knowledge on side effects of medication
- experienced Stigma
- Social support
- Side effect
- Pills burden
- Number of prescriptions
- ART Enrolment Home of patient
- Inadequate food
- Forgetfulness of treatment
- family discrimination
- Access for Safe drinking Water
- Electricity
- Latrine
- House item
- Substance use

3. **Health care provider factors are**

    - Patient satisfaction
    - Patient trust
    - Ensuring privacy
    - Time spent discussing medication

- Poor communication

4. Health system related factors

- Distance to health facility
- Time spent on travel to health facility
- Supply of medication
- Counseling service
- Transportation
- Support services [Nutritional]
- Waiting time to get medication
- Availability of drugs in the health center

4.6 Data Collection Instrument

4.6.1 Data Collection Instruments

Two-types of data collection instruments were used

Facility based TB registration logs reviewed**:** by using structured checklist, data that registered on national TB registration book extracted. Pre-tested interviewer administered structured questionnaire were used. The questionnaire has different parts that include socio demographic, patient health and behavioral related factors, and health care provider related factors, medication related factors and other risk factors associated with non-adherence. The questionnaire was pre-tested on TB patients who were on treatment in Kulito hospital, than after modification was made based on pre-test finding.

4.6.2 Data Collection Method

After having one days participatory training the data collectors (seven of them diploma nurses and one BSC nurses), data were collected from TB registration books. Variables that were collected from TB registration were sex, age, address of patients and contact persons, smear result, dosage of pills that had been taken by patient during treatment regimen, missed dose, missed date, phase of chemotherapy, category of TB, treatment outcome and HIV status.

Non-adherence was calculated by missed doses divided to 168 total recommended of days from treatment initiation to treatment termination in line with prescription by health professionals[10]. Study participants were traced and interviewed by visiting their homes through Semi-structured questionnaire. Fourteen data collectors were (All were ten grade complete) were participated in data collection and four supervisors (all were health officers). Data collectors were used patients addresses and patients contact addresses selected from TB registration books. Health extension workers (HEW) participated for searching study participants in their own kebeles. After verbal consent was obtained from the study participants, they were interviewed. Family income was calculated based on reported monthly salary for paid workers.

Monthly income from petty trade or daily labor and or prices and quantity of annual agricultural production was calculated by dividing the annual income by twelve months.

Distance was calculated both in terms of number of hours that average persons have to walk to reach the nearest health facility and in terms of kilometer to assess actual physical distance from home to the nearest health facility. Drugs side effects and drug burden beliefs also measured by yes or no questions.

4.7 Data Quality Assurance

A total of twenty two (22) data collectors and four (4) supervisors were trained for two days by the principal investigator. On the training eight data collectors (all are diploma and TB focal persons) for TB registration book review, fourteen data collectors (all grade ten complete) for tracing and interview study subjects, four (4) supervisors (all were health officers) were trained on data collection methods. Major topics on the training were objectives of the study, on approach to interview study participants after taking verbal consent, understanding questionnaire including record review checklist. TB focal persons did not participated during tracing patients from their home for sake of minimize interviewer biases.

Pre -testing of the questionnaire was done on patients who following their treatment, in Kulito primary Hospital and adjustments was made on the questionnaire based on the identified problems. During data collection, the completeness of the questionnaire was checked daily by supervisors and principal investigator until end of data collection to keep data quality. Seventeen (17) questionnaires incorrectly filled and returned to the data collectors to correct it by visiting study participants. Questionnaires was prepared in English language and translated to Amharic language then it converted again to English for ensuring consistency.

4.8. Data analysis procedures

Data were entered in to Epi-data version 3.5.1 software database for quality control, it were edited, coded, cleaned and analyzed using statistical package for social sciences (SPSS) for Windows version 16 software database. Descriptive statistical techniques used to obtain summary values for cases and controls separately. Statistical significance was determined by using $p<0.05$ and 95% CI as a cut-off point for decision-making. Binary logistic regression was performed for each independent variable with dependant variables to identify their association. Independent Variables with $P<0.25$ during bivarate analysis were selected for multivariate analysis. The final model was constructed by using backward stepwise logistic regression method. Variables were selected from four different components areas, patient related factors that include psychosocial and social environments, socio demographic related factors, and health care provider related factors and health facility related factors. Socio demographic related factors, sex, monthly family income, residence area, educational status, family size. Patient health and behavioral related factors, forgetfulness to medication, stopping medication when they feel better, experiencing stigma, disclosing of disease status to their family, swallowing difficulties of anti-TB medications presence of own shelter to live, rooms per house, owning of TV, owing of radio, presence of electricity and access for safe drinking water. Medication side effect and pills burden related factors were from medication related variables. Health Care provider related variables, service satisfaction, counseling service about treatment, and good communication with clients. Health facility related factors, distance from home to nearest health facility, time to reach nearest health facility, were collectively entered for multivariate analysis.

4.9 Ethical Considerations

Ethical clearance and formal letter was obtained from Ethical Review Board of Jimma University College of Public Health and Medical Sciences. Permission was obtained from SNNPR regional health bureau and Halaba special woreda health office. Verbal informed consent was confirmed from the study participants after explaining the purpose of the study. Participants were assured for anonymity. Data were kept confidential and anonymous and it was used only for research purpose. They also informed that they would not be forced to answer questions and they could withdraw at any time if they did not want to participate

4.10 Dissemination Plan

The results of the study will be submitted to the department of Epidemiology and public defense will be carried out in front of the external of examiners. Moreover, hard copies of the thesis will be submitted to Halaba district health office and studied health facilities. This will be done through submission of reports and presenting findings at appropriate seminars, workshops and conferences. Besides that, efforts will be made to publish the finding in a peer reviewed reputable scientific journal.

4.11 Limitation of the Study

Recall bias is one of inherent limitations for this study due to that some variables may not be clearly measured. In addition to this, selection bias is also drawback for this study due to these cases may be controls or controls may be cases because of incomplete information in TB registrations books registered during documentations. Some variables were measure by yes or no but if it conducted by prospective cohort study it better to measure them.

4.12 Operational Definition

Adherent (control): Those who took 90% or above expected doses of anti TB drug in line with physician prescriptions over treatment period or they interrupt less than 10% of expected doses their during regimens [17, 19].

Non-adherent (cases): those who interrupt 10% or above expected prescribed anti TB doses over treatment regimen[17, 19]

Defaulter: those who interrupt their medications for followed at least one month of anti TB drug but lost treatment for the consecutive two months.

Absenteeism: during the intensive phase, if a patient has not attended for two days the appointed clinic.

Treatment interruption: are patients who took treatment for at least one month and discontinued for less than eight consecutive weeks.

New case of TB: patient who never had treatment history for anti TB drug treatment previously.

Access for safe drinking water: patient who travel more than one two hour for searching safe water (tape) considered as lack of safe drinking water.

Relapse TB cases: patient who declared cured or treatment complete previously but positive for bacteriological test.

Treatment failure: patient who treated previously for TB but a retreatment regimen after previous treatment has failed.

MDR-TB: Strain of mycobacterium tuberculosis that is resistant to at least two most powerful first line treatment drugs (Rifampicin and Isoniazid).

Lack of access for safe drinking water: traveling more than one hour to get tap water

Lack of service satisfaction: perception of patients towards health care providers service

Social environment: that indicates social service availability, shelter, water, house items, , transportation mechanism and electricity .

CHAPTER 5: RESULTS

Of the total, 688 new tuberculosis patients who were registered for treatments, 609 (88.5%) study subjects were identified for source of population. Cases were 223 and controls were 486. Out of 180 sampled, for each cases and controls, 166(92.2%) cases and 166(92.2%) controls were traced and interviewed successfully. During data collection, Seven (2%) cases were traced but died, eight (2.2%) controls were traced but they shifted residence area and 13(3.6%) were not traced due to incorrect addresses listed in health facilities records. The overall non-adherence was 32.4%.

5.1 Socio-Demographic Characteristics Distribution and Their Association to Non-Adherence among TB Patient

Out of study subjects, males constitute 84(50.6%) of the cases and 96 (57.8%) of controls while females accounts for the rest of the cases and controls. The mean age for cases was 32.14 (SD+13.5) years and 32.4 (SD +12.8) years for control groups. Majority of study subjects were Halabian ethnic group 121 (72.9%) cases and 104(62.7%) were controls. Regarding religion compositions of study, 127(76.5%) cases and 119(71.7%) controls Muslims where as 39(23.5%) cases and 47(28.3%) were Christians. Among study subjects, 115 (69.3%) cases and 100 (60.2%) controls were rural where as 51(30.7%) cases and 66(39.8%) were controls urban dwellers. Educational status of study participants, 92(55.4%) cases and 72(43.4%) controls were illiterate. Regarding to occupations, currently unemployed cases were 108(69.3%) and 97(58.4%) controls, unemployment among cases was more as compared to controls (Table 1). Estimated average monthly income for cases and controls was 416 and 566 ET birr respectively. Average family size for cases were six where as for controls five, non-adherence among females was 1.34 times more likely as compared to males (Table1).

Table 1 Socio demographic characteristics distribution and association with non-adherence in Halaba special district, March 2014

Variable	Cases n=166(%)	Controls n=166(%)	COR (95% CI)	p-value
Sex				
Male	84(50.6)	96(57.8)	1.34(0.86-2.06)	0.187
Female	82(49.4)	70(42.2)	1.00	
Age(means +SD)	32.14(+13.5)	32.41(+12.82)	0.99(0.98-1.01)	
Residence				
Rural	115(69.3)	100(60.2)	1.48(0.95-2.34)	0.085
Urban	51(30.7)	66(39.8)	1.00	
Educational status				
Literate	74(44.6)	94(56.6)	1.6(1.05-2.501)	0.029
Illiterate	92(55.4)	72(43.4)	1.00	
Religion				
Muslim	127(76.5)	119(71.6)		
Christen	39(23.5)	47(28.3)		
Marital status				
Married	124(74.7)	122(73.5)	0.939(0.5-1.5)	
not married	42(25.3)	44(26.5)	1.00	
Monthly income(mean)	416	566	0.99-1.00	0.127
Families size	6	5	1.00-1.18	0.03
Employment				
Employed	58(34.9)	69(41.6)	1.32(0.85-2.00)	0.215
Unemployed	108(65.1)	97(58.4)	1.00	
Ethnicity				
Halaba	121(72.9%)	104(62.7)	0.62(0.39-0.99)	
Others	45(27.1)	62(37.3)	1.00	

5.2 Patient Health Related Characteristics and Their Distribution to Non-Adherence among TB Patients

5.2.1 Behavioral related factors

The study identified that, 18(10.8%) cases and 11(6.6%) controls were reported, they faced stigma from their friends during treatment regimens, of the total study participants, 22(13.3%) cases and nine (5.4%) controls disclosed their disease status to their family. The study depicted that, cases perceived they would be more stigmatized than controls if they disclose their disease to others, 28(16.9%) and 25(15.1%) respectively. Sixty-seven (40.4%) Cases and 54 (32.5%) controls stopped taking anti-TB drugs because they felt better or they felt they were cured from the disease. Majority of cases and controls responded that they believe TB is curable disease.

Forgetfulness among cases was 86(51.8%) compared to 59(35.5%) for controls. Chat chewing among cases was 53(32.1%) compared 48(28.9%) for controls. Most patients, 102(61.4%) cases and 102(61.4%) controls were got social support from their relatives (Table2).

Table 2 Behavioral related factors characteristics distribution and their association to Non-adherence in Halaba special district, March 2014.

Variable	Cases, n =166 (%)	Controls, n=166(%)	COR (95% CI)	p-value
Did you have swallowing difficulties TB drug during treatment?				
Yes	17(10.2)	25(15.1)	1.00	0.189
No	149(50.7)	141(84.9)	1.55(0.805-3.00)	
Have you ever had any experience of stigma				
Yes	18(10.8)	11(6.6)	1.00	0.178
No	148(89.2)	155(93.4)	0.58(0.26-1.27)	
Did you perceive others would stigmatize you if they know your disease status				
Yes	28(16.9)	25(15.1)	1.00	0.178
No	138(83.1)	138(84.9)	0.87(0.48-1.57)	

Did you postpone collection medication due fear of stigma?				
Yes	9(5.4)	5(3)	1.00	0.28
No	157(94.6)	161(97)	1.84(0.6-5.6)	
Have you disclosed your disease status to your family				
YES	22(13.3)	9(5.4)	2.66(1.188-6)	0.017
NO	144(86.7)	157(94.6)	1.00	
Feeling better, stop taking your TB drug				
YES	67(40.4)	54(32.5)	1.00	0.103
NO	99(59.6)	112(67.5)	0.54(0.25-1.13)	
Believe TB is curable disease				
Yes	156(94)	155(93.4)	0.903(0.37-2.2)	1.00
No	10(6)	11(6.6)	1.00	
forgetfulness				
YES	86(51.8%)	59(35.5%)	1.00	0.003
NO	80(48.2)	107(64.5)	1.95(1.25-3.0)	
Alcohol use			1.00	
Yes	11(6.7)	10(6)	1.11(0.46-2.7)	0.811
No	154(93.3)	156(94)		
Chat chewing				
Yes	53(32.1%)	48(28.9)	1.00	0.53
No	112(67.9)	118(71.1)	1.16(0.73-1.9)	
Social support				
Yes	102(61.4)	102(61.4)	0.64-1.55	1.00
No	64(38.6)	64(38.6)		

5.2.2 Social Environment Related Characteristics Distribution and Their Association to Non-Adherence among TB Patient

The study depicted that among respondents 76 (45.8%) of cases and 104 (62.7%) of controls had their own shelters. Majority of cases 106(63.9%) and 87(52.4%) controls had no radio. Twenty-six (15.7%) cases and 35(21.1%) controls had TV in the house. In terms of access to safe drinking water, controls were more unlikely to have access for safe drinking water than cases, 104(62.7%) and 131(78.9%) respectively. In the bivariate analysis owning house (COR=1.98; 95% CI: 1.28-3.07), having radio in house (COR=1.6; 95% CI: 1.03-2.48), having electricity (COR 1.72 (1.1, 2.7) and access to safe drinking water (COR= 2.23; 95% CI: 1.37-3.63) were found to statistically significantly associated with adherence to treatment (Table 3).

Table3 Environmental related factors distribution and their association with non-adherence March 2014 Halaba special district.

Variable	Characteristics	Cases n=166(%)	Controls n=166(%)	COR (95% CI)	**p-values**
Owning home to live in	YES	76(45.8)	104(62.7)	1.98(1.28-3.07)	0.002
	NO	90(54.2)	62(37.3)	1.00	
Having radio in the house	YES	60(36.1)	79(47.6)	1.6(1.03-2.48)	0.035
	NO	106(63.9)	87(52.4)	1.00	
Having TV in the house	YES	26(15.7)	35(21.1)	1.4(0.8-2.5)	0.2
	NO	140(87.3)	131(78.9)	1.00	
Having cycle	YES	19(11.4)	28(16.9)	1.57(0.8-2.9)	0.16
	NO	147(88.6)	138(83.1)	1.00	
Having cart	YES	12(7.2)	14((8.4)	1.184(0.5-2.6)	0.6
	NO	154(92.8)	152(91.6)	1.00	
Having electricity	YES	51(30.7)	72(43.4)	1.72(1.1-2.7)	0.017
	NO	115(69.3)	94(56.2)	1.00	
Having latrine	YES	130(79.3)	133(80.1)	1.05(0.6-1.8)	0.3
	NO	36(20.7)	33(19.9)	1.00	
Access for safe drinking water	YES	62(37.3)	35(21.1)	2.23(1.37-3.63)	0.001
	NO	104(62.7)	131(78.9)	1.00	

5.2.3 Medication Related Factors Distributions and Their Association to Non-Adherence

During treatment period, 61(36.7%) cases and 41(24.7%) controls had faced anti-TB drug side effect. Drug side effect is 1.81 times more frequent among cases as compared to the controls, (COR=1.18; 95% CI: 1.07-3.06). Among study participants, 107(64.5) cases and 51(30.7%) controls reported that they had additional drugs during anti-TB drugs treatment. Use of other medication with anti-TB drugs is higher among cases as compared to controls (Table4). One hundred sixty nine 116(69.9%) cases and 124(74.7%) controls knew duration of treatment periods. Both cases 41(24.7%) and 40(24.1%) controls have reported that, they fear additional prescriptions simultaneously to anti-TB drugs from health professionals. Among study participants, 99(59.6%) cases and 101(60.8%) controls had taken HIV counseling and testing during medication period (Table4).among study subjects, 107(64.5%) cases and 51(30.7%) controls were reported that they had additional drugs(pill) burden during treatment period, fifty five (31.3) cases and 28(16.9%) controls were did not satisfied with health care provider service.

Table 4 Medication related factors distribution and their association to non-adherence in Halaba special district, March 2014

variable	Cases n=166(%)	Controls n=166(%)	COR(95% CI)	p-value
Medication has side effects				
YES	61(36.7%)	41(24.7%)	1.00	0.03
NO	105(63.3%)	125(75.3%)	2.53 (1.25-5.11)	
Knowledge treatment durations				
YES	116(69.9)	124(74.7)	1.27(0.78-2.06)	0.327
NO	50(30.1)	42(25.3)	1.00	
Other drugs with anti-TB drugs (pills burden)				
YES	107(64.5)	51(30.7)	1.00	0.001
NO	59(35.5)	115(69.3)	4(2.6-6.5)	
Fear for additional umber of prescriptions				
YES	41(24.7)	40(24.1)	1.00	
NO	125(75.3)	126(75.9)	0.6-1.7	0.9
HIV test during medications				
YES	99(59.6)	101(60.8)	1.00	0.823
NO	67(40.4)	65(39.2)	0.95(0.67-1.47)	
ART enrolment				
YES	37(11.1)	21(12.5)	1.000	0.38
NO	295(90.4)	145(87.3)	0.74(0.37-1.46)	
Availability of drug in the health facility				
YES	2(1.2)	1(0.6)	0.18-22.4	0.57
NO	164(98.8)	165(99.4)		

5.3 Health Care Provider Related Factors Distribution and Their Association to Non-Adherence among TB Patient

Table5, shows that most of cases, 141(84.9%) and 149(89.8%) controls had got counseling service during medication period from health care providers. Bivariate results indicate that likelihood for non-adherence among individuals who did not counseled before treatment initiation was 1.55 times more likely as compared to individuals who counseled by health care providers before treatment initiation (Table5).

Majority of controls 112(67.5%) and 88(53%) cases had good communications with health care providers and the communication was better for controls as compared to cases. Odds of poor communication with health care providers, was 1.83 more frequent among cases as compared to controls.

Most of cases 136(82%) and 152(91.6%) controls reported that they had chance to ask health care providers about their health status and benefit of medications. Among study subjects who did not have chance to ask questions, 2.4 times more high risk for non-adherence as compared to individual who had chance for questions.

Table 5: Health care provider related factors distribution and their association to non-adherence for drug treatment, March 2014 Halaba special district.

	Cases n=166 (%)	Controls n=166(%)	COR (95% CI)	p-value
Getting counseling services				
YES	141(84.9)	149(89.8)	1.55(0.80-3.00)	
NO	25(15.1)	17(10.2)	1.00	0.19
Ensure your privacy by counseling you at private class				
YES	128(71.1)	145(87.3)	0.95(1.14-3.67)	
NO	38(22.9)	21(12.7)	1.00	0.88
Did you get your medications timely, regularly and adequately				
YES	153(92.2)	157(94.6)	1.48(0.537-1.708)	0.38
NO	13(7.8)	9(5.4)		
Keeping privacy during medication				
YES	139(83.7)	138(83.1)	0.95(0.53-1.70	0.88
NO	27(16.3)	28(16.9)	1.00	
Have you ever given the chance to ask questions				
YES	136(81.9)	152(91.6)	2.39(1.2-4.7)	
NO	30(18.1)	14(8.4)	1.00	0.011
Satisfied with your health care provider service				
YES	114(68.7)	138(83.1)	2.24(1.33-3.78)	0.002
NO	52(31.3)	28(16.9)	1.00	
Good communications with your health care provider				
YES	88(53)	112(67.5)	1.83(1.17-2.87)	0.007
NO	78(47)	54(32.5)	1.00	

5.4 Health Facility Related Factor Distribution and Their Association to Non-Adherence

Cases were more likely than controls to report that, they were traveled 5.3 kilometers distance on average to nearest health facility, whereas controls traveled 4.2 kilometer, the difference was statistically significant($p<0.002$). Eighty (48.1%) cases and 76(45.8%) controls were reported that public transport was available to go health facility. Average time that time required to reach health facility was sixty minute for cases and fifty minute for controls (Table6).

Table 6 Health facility related factors distribution and association of to non-adherence Halaba special district March 2014.

Variable	characteristics	Cases n=166 (%)	Controls n=166(%)	COR (95% CI)	P-value
Distance to health center(km)	Mean	5.3	4.2	1.1(1.04-1.19)	0.002
Time to health center(minutes)	Mean	60	50	1.00-1.00	0.067
Transport on foot to	YES	140(84.3)	149(89.8)	1.00	0.144
	NO	26(15.7)	17(10.2)	0.61(0.32-1.18)	
Availability of public transport	YES	80(48.2)	76(45.8)	0.9(0.59-1.39)	0.77
	NO	86(51.8)	90(54.2)	1.00	
Cost for transport expensive	YES	56(33.7)	62(37.3)	1.00	0.49
	NO	110(66.3%)	104(62.7)	0.85(0.54-1.33)	

5.5 Factors Which Independently Predicting to Non-Adherence among TB Patient

As Table7 shows multivariate result indicates, females were more likely to be non-adherent as compared to males. Odds for non-adherence among female was 1.87 times more likely than male, (AOR=1.87; 95% CI: 1.06-3.29). Among study subjects those who had forgotten to fill anti-TB drugs from health facilities were nearly three times more likely to be non-adherent as compared to those who did not (AOR=2.79;95%CI:1.57-4.93).

Other pre-disposing factor that associated with non-adherence was "feeling better". Those who perceived feeling better (perceived cured) from disease four times more likely to be non-adherant as compared to those who did not perceive feeling better from disease and it has significantly association with non-adherence (AOR=4.04; 95% CI:1.48-11.04).

Medication side effect was other predisposing factor that independently associated with non-adherence, those who experienced anti-TB drug side effect were nearly six times more likely to be non-adherant as compared to those who did not have anti-TB drug side effect(A0R=5.46;95% CI:2.03-14.63).

As shown in table7, additional medication that was prescribed by health professional or pill burden was independently associated with non-adherence. Those who had pills burden or additional drugs beside anti-TB drugs were nearly five times more likely to be non-adherent as compared to those who did not had pills burden, (AOR=5.09;95% CI:5.09-8.82). Among study subjects, those who did not satisfied with health care provider service were three times more likely to be non-adherant as compared to those who satisfied with health care provider services and it was independently associated with non-adherence, (AOR=3.27; 95% CI:1.71-6.26). Owning of home to live was other factor that independently associated with non-adherence, individuals who have not their own home or homeless were 2.6 times at higher risk for non-adherence as compared to study individuals who have their own home (AOR=2.63;95%CI:1.5-4.6). Lack of access for safe drinking water and forgetfulness to anti-TB treatment independently associated with non-adherence. They were 2.58(AOR=2.58; 95% CI: 1.41-4.72and 2.79 (AOR=2.79; 95 % CI: 1.57-4.93) respectively associated with non-adherence.

Table 7 Multivariate analysis factors independently associated to non-adherence for anti-TB drug treatment among TB patients, Halaba special district, May 2014.

Variables	Cases n=166(%)	Controls n=166(%)	AOR(95%CI)
Medication Sid effect			
YES	61(36.7%)	41(24.7%)	1.00
NO	105(63.3%)	125(75.3%)	5.46(2.03-14.63)
Pills burden anti TB rugs			
YES	107(64.5)	51(30.7)	1.00
NO	59(35.5)	115(69.3)	5.09(2.94-8.82)
feel better stop TB drug			
YES	67(40.3)	54(32.5)	1.00
NO	99(59.7)	100(67.5)	4.04(1.48-11.04)
satisfaction to health service			
YES	114(68.7)	138(83.1)	3.27(1.71-6.26)
NO	52(31.3)	28(16.9)	1.00
Own Shelter (home)to live			
YES	76(42.2)	104(57.8)	2.63(1.5-4.6)
NO	90(59.2)	62(40.8)	1.00
Lack of safe water			
YES	62(37.3)	35(21.1)	2.58(1.41-4.72)
NO	104(62.7)	131(78.9)	
Distance to health facility(mean)	6	5.3	1.18(1.08-1.28)
Forget fullness medication			
YES	86(51.8)	59(35.5)	1.00
NO	80(48.2)	107(64.5)	2.79(1.57-4.93)
Sex			
Male	84(46.7)	96(53.3)	1.87(1.06-3.29)
Female	82(53.9)	70(46.1)	1.00

CHAPTER 6: DISCUSSION

Non-adherence to anti-TB medication often leads to treatment failure, treatment relapse and for development of MDR-TB or anti-TB drug-resistant mycobacterium tuberculoses bacteria[14]. This study tried to identify major factors related to non-adherence for anti-TB drug treatment and the findings were almost similar with the findings of many studies discussed in the literature review. Nevertheless, this finding identified several potentially modifiable risk factors associated with non-adherence in addition to non-modifiable risk factors.

Notably, one major determinant that independently associated with non-adherence was adverse anti-TB drug side effect. Anti-TB drugs have common side effects that influence treatment adherence among TB patients. The study showed that the probability of non-adherence due to ant-TB drugs side effect among cases was 5.46 times higher than among controls. One of the reasons for such incidence of drug side effects perhaps could be giving medication on empty stomach is common practice during anti-TB treatment. The DOT providers need provide adequate orientation regarding possible side effects, active follow up, reassurance patients and managing or promptly referring to the higher level of medication centers. Frequently reported minor side effects could be successfully managed with proper instructions on drug consumption, and prompt symptomatic treatment should be applied before that leads to non-adherence. This finding was supported by similar case control study from Oromeya region Arsi Zone and India, reported that drug side effect was independently associated with non-adherence, (AOR=4.2;95%CI1.51-11.66) and (AOR=2.56;95%CI 1.87-3.47) respectively[20, 29]. Meta analysis and qualitative studies done in China also reported that drug side effect was independently associated with non-adherence [19].

The study established that pills burden or additional drugs with anti TB drug was factor that independently associated with non-adherence. Additional drugs prescribed to treat additional illness may cause more drug side effect that may ultimately lead to non-adherence. Patients on tuberculosis treatment usually experience an increased appetite and also pills burden may need more adequate food but to the low-income group where access to food is a problem, inadequate food may pose a challenge to treatment adherence. Studies conducted in Ethiopia and South

Africa confirmed that the use of a multiple drugs independently associated to non-adherence [29, 34].

The perception of **"feeling betters"** was another factor that found to be associated with non-adherence. Thirty six percent (36.4%) of non-adherent reported that "feeling better'' as the main reason for discontinuing treatment, the possible explanation for this finding might be during continuation phase most of the symptoms disappear and patients may believe they are cured from disease. That may encourage patients to become reluctant to bear the extra burden of the cost of travel, time, and they focus more on their daily work so that patients interrupts their treatment without finishing recommended course. Study conducted in SNNPR stated that among defaulter, 26% interrupt their treatment due to perceived "feeling better" [14]. A case controls study was conducted in public and private hospitals at Java province, in Indonesia and reported that 47% of respondents were reported, the reason for non-adherence was feeling better [17].

This study established that lack of service satisfaction among TB patients was other factor that significantly associated with non- adherence, 31.3% of non-adherents among cases were interrupted their medication due to lack of service satisfaction from health care providers. Possible explanations for dissatisfaction might emanate from shortage of health care providers, lack of staff motivation, negative attitude toward patients and uncomfortable administration regulation to patient or inconvenient time schedules. A similar finding reported from India stated that dissatisfaction for services delivered by health care providers was significantly associated with non-adherence[20]. Moreover, studies conducted in SNNPR and South Africa concluded, that service satisfaction is key components to enhance adherences among TB patients[24, 33]. Health care providers should provide treatment related information and clearing the doubts regarding anti TB treatment considered as important to increase service satisfactions among patients.

Present study also depicted that **"forget fullness"** to go to health facilities for filling TB drugs was other factor that associated with non-adherence. Fifty one percent (51.8%) of cases were missed their medication due to forgetfulness (AOR=2.8; 95%CI: 1.57-4.93). This might be an indication that dissemination of information including health education regarding TB medication was low. Health professional should provide adequate information about anti-TB

drug importance to patients, for their caretakers in the case of children and family supporter to remind patients for their medications. This finding shows remarkable difference with study that was done in Northwest Ethiopia stated that odds for non-adherent among study participants who forgot their anti-TB medication was 7 times more likely as compared who didn't, (AOR=7.04;95% CI:1.4-35)[16]. Other studies that were done in China and India also reported that forgetfulness is common patient related factor that is independently associated with non-adherence [19].

According to current study, lack of their **own shelter** was independently associated to non-adherence for anti-TB medications. As it clearly explained above homeless cases were 2.63 times more likely to be non-adherent as compared to controls. Homeless individuals have unstable conditions that might be a challenge for them to follow their medications according to health professional recommendations. It might therefore be a challenge to address health service accessibility or treating patient according treatment guidelines. This finding provided pertinent information on how social environmental related factors indirectly contribute for non-adherence among TB patients. Studies conducted in India, Canada and Uzbekistan reported that lack of shelter (homeless) was determinants for non-adherence it also independently associated to non-adherence [21, 30, 35].

Another finding of present study was lack of access to safe drinking water that associated with non-adherence. Nevertheless, there is no any documentation on this issue in all literatures that had been reviewed, 29.2% of cases were discontinued treatment due to lack of access for safe drinking water. Getting safe drinking water is difficult in the study area, people get water from deep boreholes and patients waste their time looking for safe drinking water for their daily activity, which also might influence their adherence to anti-TB treatment.

Non-adherence was significantly higher among females as compared to males in this study. Among non-adherent women who participated from rural were 58.2%. This may indicates that rural mothers were may busy with different homework like child bearing, food making and fetching water, economical-dependence, inability to decide by themselves as result of gender inequality. This finding is supported by studies conducted in India and Zambia stated that being female 2.5 times more likely to be non-adherant than males . However, this finding was

inconsistence with different studies that were conducted in Tanzania and Kenya, stated that females were more likely to be adherent than male (AOR=2.04;95% CI:1.24-3.02) and (AOR=1.43; 95%CI:1.15-1.78) respectively [25, 36]. The possible explanation may be gender inequality, socio cultural and socio economic differences male and female.

Distance from home of respondent to the nearest health facility was other risk factor for non-adherence and it was statistically significantly among case and controls with $p<0.002$. This result was similar with pervious study that was conduct in SNNPR and North West Gondar [14, 16]. "A review of compliance to anti-tuberculosis treatment and risk factors for defaulting treatment in Sub Saharan Africa" stated that distance from the hospital to the patient home was one possible factor for non-adherence among TB patients [37].

Finally, this study used a sound study design (Case-control design) which is one of the analytic epidemiologic study designs applied to identify potential risk factors that associated with non-adherence among TB patient.

However, it might have some limitations such as recall bias that is inherent to this study design. Incomplete information about adherence to drug treatment from documents was other limitation. Adherence was assessed from TB registration book that based on patient self-report may lead to over estimation of adherence and that might lead for misclassification among cases and controls considered as limitation for this study.

CHAPTER 7: CONCLUSION AND RECOMMENDATION

7.1 Conclusions

This study tried to measure potential determinants that influence anti-TB treatment in Halaba special woreda. The potential risk factors for non-adherence to drug treatment among TB patients were, Adverse medication side effect, pills burden, feeling better, lack of service satisfaction, forgetfulness of anti-TB medication, lack of their own home or shelter ,lack of access for drinking water, gender or being female and distance to the nearest health facility.

7.2 Recommendations

Based on the study findings it is recommended that

1. Health professional should follow holistic prevention mechanism to mitigate anti-TB drug adverse side effects that includes regularly discussion with patient about its symptom and informing management options based on national TB treatment guild line.
2. Health education and counseling should be provided when additional medication prescribed by health professionals and why additional drugs prescribed for them.
3. Implementing DOTS strategy efficiently to encourage patients to finalize treatment accordingly.
4. Creating regular public forums to discuss on service related problems and conducting patient satisfaction survey to see service delivery problems.
5. Integrated project should be carried out to improve socio-economic related factors to decrease non-adherence to anti TB drugs.
6. Appling community based TB prevention with collaboration Health extension packages and decentralization of anti-TB treatment to health post level by using HEW to ensured adherence.
7. Special attention for safe drinking water to sustain TB treatment adherence and to solve gender related factors effectively.
8.

REFERENCE

1. WHO (ed.): Global tuberculosis report2013. Switzerland: WOH; 2013

2. FMOH: First Ethiopian National Population Based Tuberculosis Prevalence Survey, Addis Ababa. In. Edited by EHNRI; 2011.

3. FMOH (ed.): guideline for clinical and programmatic management for TB, TB/HIV and leprosy in Ethiopia; 2013.

4. Organization WOH: Implementing the WHO Stop TB Strategy: A Handbook for National TB Control Programmes: World Health Organization; 2008.

5. SabatÃ¢e E: Adherence to long-term therapies: evidence for action: World Health Organization; 2003.

6. Awofeso N: Anti-tuberculosis medication side effects constitute major factor for poor adherence to tuberculosis treatment. *Bulletin of the World health Organization* 2008, **86**(3):

7. Walid F. Gellad JG, Elizabeth A. McGlynn: A Review of Barriers to Medication Adherence: A Framework for Driving Policy Options. *RAND HEALTH* 2009.

8. Mitchison D: How drug resistance emerges as a result of poor compliance during short course chemotherapy for tuberculosis Counterpoint. *The International Journal of Tuberculosis and Lung Disease* 1998, **2**(1):10-15.

9. Leimane V, Riekstina V, Holtz TH, Zarovska E, Skripconoka V, Thorpe LE, et al.: Clinical outcome of individualized treatment of multidrug-resistant tuberculosis in Latvia: a retrospective cohort stud**y**. *The Lancet* 2005, **365**(9456):318-326.

10. Monica G, Amuha1 PK, Freddy E, Kitutu1, Richard Odoi Adome 1, Joan N Kalyango1: Non-adherence to anti-TB drugs among TB/HIV co-infected patients in Mbarara Hospital Uganda: Prevalence and associated factors. *African Health Sciences* 2009, **9**(52):8-15.

11. Lars Os, Terrence Bl: Adherence to Medication. *The New England journal of medicine* 2005, **5**(353).

12. Tobias PN, Esnat Ch, Akeem Ke, George Bel, Isiah Da, Dennis Nd, et al: Levels of Tuberculosis Treatment Adherence among Sputum Smear Positive Pulmonary Tuberculosis Patients Attending Care at Zomba Central Hospital, Southern Malawi, 2007–2008. *PLOS ONE* 2013, **8**(5):e63050.

13. Gebretsadik Be, FEaAA: Treatment outcome of smear-positive pulmonary tuberculosis patients in Tigray Region, Northern Ethiopia. *BMC public health* 2012, **12**:537.

14. Estifanos Bi, Bernt Li: Determinants of treatment adherence among smear-positive pulmonary tuberculosis patients in Southern Ethiopia. *PLoS medicine* 2007, **4**(2):e37.

15. Takele Ta, Yemane Be, Yigzaw Ke, Markos Ab: Long distance travelling and financial burdens discourage tuberculosis DOTs treatment initiation and compliance in Ethiopia: a qualitative study. *BMC health services research* 2013, **13**(424).

16. Akilew Aw, Digsu Ne, Berihun Me: **Non-**Adherence to Anti-Tuberculosis Treatment and Determinant Factors among Patients with Tuberculosis, Northwest Ethiopia. *PLoS medicine* 2013, **11**(8):e78791.

17. Bagoes Wi: Factors that influence treatment adherence of tuberculosis patients living in Java, Indonesia. *Dove press* 2009.

18. Boateng SA, KODAMA T, Tachibana T, HYOI N: Factors Contributing to Tuberculosis (TB) Defaulter Rate in New Juaben Municipality in the Eastern Region of Ghana. *J Natl Inst Public Health*, **59**:3.

19. Weiguo Xu, Yang Zh, Limei Zh, Hongbing Sh, Jianming Wa: Adherence to anti-tuberculosis treatment among pulmonary tuberculosis patients: a qualitative and quantitative study. *BMC health services research* 2009.

20. Sophia Vi, Lakbir, Singh Ch, Balasangameshwara Ha, Unnikrishnan Pa, Sumathi Go: Risk Factors Associated with Default among New Smear Positive TB Patients Treated Under DOTS in India. *PLos one* 2010.

21. Kulkarni PY, Akarte SV, Mankeshwar RM, Bhawalkar JS, Banerjee A, Kulkarni AD: Non-Adherence of New Pulmonary Tuberculosis Patients to Anti-Tuberculosis Treatmen**t**. *Annals of Medical and Health Sciences Research INDIA* 2013, **3**(1):67-74.

22. Abdallah Mk, Fred Lw, Saidi Eg, Alexander Sc, Eveline Ge, Frank va, Leth: Adherence to Tuberculosis Therapy among Patients Receiving Home-Based Directly Observed Treatment, Evidence from the United Republic of Tanzania. *PLoS medicine* 2012.

23. Samuel Ag, BOATENG TK, Tomoko TA, Nobuyuki HY: Factors Contributing to Tuberculosis (TB) Defaulter Rate in NewJuaben Municipality in the Eastern Region of Ghana. *Journd of the National Institute of Public Health* 2010, **59**(3):291－297.

24. Alyssa JL, Timothy H, Karin We, Abe Mi, Martie var Walt: Patient- and provider-level risk factors associated with default from tuberculosis treatment, South Africa,: a case-control study. *BMC health services research* 2012.

25. Muture BN, Margaret NKu, Peter KK, Ephantus WO, Victor OO, Francis: Factors associated with default from treatment among tuberculosis patients in Nairobi province, Kenya: a case control study. *BMC public health* 2011, **11**(1):696.

26. Daniel O, Oladapo O, Alausa O: Default from tuberculosis treatment programme in Sagamu, Nigeria. *Niger J Med* 2006, **15**(1):63-67.

27. Yone E, Kuaban C, Kengne AP: HIV testing, HIV status and outcomes of treatment for tuberculosis in a major diagnosis and treatment centre in Yaounde, Cameroon: a retrospective cohort study. *BMC infectious diseases*, **12**(1):190.

28. Sagbakken M: Barriers and enablers in the management of tuberculosis treatment in Addis Ababa, Ethiopia: a qualitative study. *BMC Open access* 2008.

29. B. Tekle DH, A. Ali: Defaulting from DOTS and its determinants in three districts of Arsi Zone in Ethiopia. *INT J TUBERC LUNG DIS 6(7):* 2002, **7**(6):573-579.

30. PamelaOr: Adherence to tuberculosis care in Canadian Aboriginal populations. *International Journal of Circumpolar Health* 2010.

31. Demissie M, Kebede D: Defaulting from tuberculosis treatment at the Addis Abeba Tuberculosis Centre and factors associated with it. *Ethiopian medical journal* 1994, **32**(2):97.

32. Sachdeva KS, Satyanarayana S, Dewan PK, Nair SA, Reddy R, Kundu D, et al: Source of previous treatment for re-treatment TB cases registered under the national TB control programme, India**, 2010**. *PLos one,* **6**(7):e22061.

33. Zekariyas Sa, YHM Ga: Patient satisfaction on tuberculosis treatment service and adherence to treatment in public health facilities of Sidama zone, South Ethiopia. *BMC health services research* 2013, **13**(110).

34. Naidoo P, Peltzer K, Louw J, Matseke G, McHunu G, Tutshana B: Predictors of tuberculosis (TB) and antiretroviral (ARV) medication non-adherence in public primary care patients in South Africa: a cross sectional stud**y**. *BMC Public health,* **13**:396.

35. Epco Ha, Maksad Kh1, Shakhnoz Us, Umid As, Umida Yu, Marieke J, et al: Default from tuberculosis treatment in Tashkent, Uzbekistan; who are these defaulters and why do they default? *Open Access* 2008.

36. Kaona FA, Tuba M, Siziya S, Sikaona L: An assessment of factors contributing to treatment adherence and knowledge of TB transmission among patients on TB treatment. *BMC public health* 2004, **4**(1):68.

37. B C: A review of compliance to anti tuberculosis treatment and risk factors for defaulting treatment in Sub Saharan Africa. *African Health Sciences* 2010, **10**(4)

Annexes1: English version questionnaires for interview

JIMMA UNIVERSITY: DEPARTMENT OF EPIDEMIOLOGY

Dear Sir/madam;

My name is_____ I am /working in Halaba special woreda/.

We are conducting survey to identify determinants of non-adherence to drug treatment among tuberculosis (TB) patient in Halaba special district woreda with collaboration Jimma University. I would like to ask you a few questions about challenges on treatment you have received and the information related with that. Your opinions are very important to study. Your answers will be kept confidential and your name will not be written on the study so there will be no possibility to identify you.

Your participation in this study is voluntary and you can withdraw from the interview at any moment without any negative consequences to you or you do have the right not to respond at all or to withdraw in the meantime, but your input has great value for the success of study.

Do you agree? Yes No

Thank you for your cooperation!

Code _____-

Instructions:Please answer the following questions by placing a circle around the appropriate number response.

No	Questions	
	I. Patient related factors	
Socio-demographic characteristics		**Code and response**
01	Occupation of the respondent	1) Farmer 2) House wife 3) Student 4) Merchant 5) Government Employee 6) Other (specify)
02	Marital status of the respondent	1) Married 2) Single 3) Widowed 4) Divorced 5) Others (specify)____
03	Educational status of the respondent	1) Illiterate (cannot read and write). 2) Read and write 3) Primary(1-8) 4) Secondary(9-10) 5) Tertiary(prep- college)
04	Religion of the respondent	1) Muslim 2) Orthodox 3) Protestant 4) Catholic 5) Other (specify)___

05	Place of residence of the respondent	1) Urban 2) Rural
06	Ethnicity of the respondent	1) Halaba 2) Amhara 3) Silte 4) Kambata 5) Garage 6) Other (specify)____
07	Marital status	1) Single 2) Married 3) Divorced 4) Widowed 5) Others specify
08	Family size of the respondent	_____
09	Monthly income in Ethiopian birr	_____Birr
Environmental factors		
10	Do you have a house to live in?	1) Yes 2) No
11	If yes, do you own the house you are living in?	1) Yes 2) No
12	How many rooms does the house have?	
13	What is the average number of windows per room?	
14	How many people live in the household?	
15	What is your source of water?	1. Tap 2. Pond3. Other/specify___

16	Does your house have electricity?	1.yes 2.no
17	Do you have a latrine to use?	1.Yes 2.No
18	Which of the listed household items do you have?	1) Radio 2) TV 3) Motorbike 4) Automobile 5) Others
	knowledge about TB	
19	How is TB transmitted in your opinion?	1) By hereditary 2) By mosquitoes bite 3) By inhalation airborne patient saliva 4) By sexual intercourse 5) By cigarette smoking
20	How long does it take continuous medications to help patient cure? It takes at least:	1) Six month 2) Eight month 3) Seven month
21	What was your source of information about TB drugs?	1) HEW 2) Health care provider 3) Radio 4) TV 5) Other
22	Do you ever forget to take your TB drugs?	1) Yes 2) No 3) don't know

23	Have you ever missed anti-TB medication? (did you remember missed TB drugs& days)	1) Yes 2) No 3) ----------
24	What was the reason for missing of TB drug?	1) Forgetfulness 2) Sleep during that time 3) Busy with my job 4) Not available in the health facility 5) I wentto other place
	Psychosocial factors	
25	Do you ever have swallowing difficulties to take your TBdrug during treatment?	1) Yes 2) No
26	Have you ever had any experience of stigma (by your family, at work or any other areas) or being treateddifferently from social/family activities/services (likeidir, ikub or teaching, working or any other activities) because of your disease status?	1) Yes 2) No
27	Did you perceive others would stigmatize you if they know your disease status?	1) Yes 2) No
28	Have ever postponed collecting your anti-TB medication from health institutions fearing somebody you know will see you?	1) Yes 2) No
29	Did/do you have other illness other than TB disease?	1) Yes 2) No
30	Have you disclosed your disease status to your family or any other individual publicly?	1) Yes 2) No
31	Have you ever have difficulty of taking your TB medication because someone from your family/community can see you?	1) Yes 2) No

32	When you feel better, do you sometimes stop taking your TB drug?	1) Yes 2) No
The following questions ask the knowledge of the patients on uses, benefits and harms of non-adhering to TB medications.		
33	What are uses of anti-TB medications?	1) Improve quality of life 2) Reduce bacteriological load 3) Increase the ability of our body to protect OI infection 4) Cures from HIV 5) Cures from TB
34	Sometimes if you feel worse when you take your TB medicine, do you stop taking it?	1) Yes 2) No
35	For how long you should take anti-TBdrug?	1) For six month without any miss 2) For eight month. 3) Till it improves my health status 4) I do not know
36	What time do you take your anti-TB medications?	1) At morning before brick fast 2) During lunch time 3) I do not know 4) Others (specify)_____
37	What are the benefits of taking TB medication as directed by physician?	1) Reduce side effects of the drugs 2) Reduce resistance of TB 3) To be cured from TB. 4) To stop transmission of TB. 5) Other (specify)_____
The following questions ask about your social support		
38	Do you ever have any form of social support during TB treatment?	1) Yes 2) No

39	If answer for question 25 is yes, what form of social support was it?	1) Verbal encouragement support 2) Financial support 3) Nutritional support 4) Other (specify)_____
40	Do/did you have a person who regularly reminds to take your TB drug?	1) Yes 2) No
The following questions ask on substance use		
41	Did you use substances or alcohol?	1) Yes 2) No
42	If the answer for question 41 is yes, which of the following did/do you use?	1) Alcohol 2) Khat 3) "Shisha" 4) Cigarette.
43	Have you faced shortage of getting food to eat in during TB treatment?	1) Yes 2) No
44	If yes to question 30, how many times did/do you eat your food per day	1) Only once 2) Twice 3) Three times 4) I don't remember it
45	Did/do you prefer other things other than anti-TB medications?	1) Yes 2) No
46	If answer to question 46 is yes, what did/do you prefer over anti-TB medications?	1) Traditional medication 2) Holly water 3) Prayer 4) Other(specify) ____

	Medication related factors	
48	Have you ever perceived medication side effects?	1) Yes 2) No
49	Have you experienced medication side effect during treatment?	1) Yes 2) No
50	How many anti-TB medications were/are you taking per day?	_____ _
52	Did you take ART drug?	1) Yes 2) No
54	Were you worried with the number of prescriptions you were taking for different diseases?	1) Yes 2) No
55	For how long did took your anti-TB medications?	_____(write in days or months or years)
	Health service related factors	
57	How far isthe house of patient from health institution?	_____K.M or day _____minutes/hours/day
58	How did you use to come to health institution to collect your anti-TB medications?	1) On foot 2) animal 3) On public transport 4) Other (specify)_____

59	If answer for question 58 is foot, why you preferred to come on foot to health institution to collect your medication?	1) Because public transport was expensive 2) Because public transport was not available/was not adequate 3) Other (specify) _____
60	If answer for question 59 is 1, 2, or 3, have you ever missed your anti-TB medications because of those reasons?	1) Yes 2) No
61	Did you get your medications timely, regularly and adequately as it was prescribed for you?	1) Yes 2) No
62	Have you ever got counseling services in the health institution?	1) Yes 2) No
63	If answer for question 62 is yes, how many times have you got counseling services during treatment?	_____
64	For how long have you waited at the health institution while you usually come to health institution to collect your medications?	_____(write in minute or hour or day)
65	Were you satisfied with the services you were getting?	1) Yes 2) No
	Provider related factors	
66	Do you trust your health provider/s keep confidential your health status?	1) Yes 2) No
67	Do you feel listened by your health provider at health institution?	1) Yes 2) No

68	Did the health provider ensure your privacy by counseling you at private room?	1) Yes 2) No
69	Have you ever been given the chance to ask questions or state about your health problems by health provider?	1) Yes 2) No
70	How many health providersdo you prefer to handle about you whenever you come to health institution to collect your medication?	1) Only one and the same person 2) Only one but can be different 3) No problem with number of health providers 4) Other (specify)__

Questions to Assess Depression in health facility

S. No	**Questions**	**Code and response**
1	How often did you feel tense or ‘wound up’?	1) Very many times 2) Many times 3) Sometimes 4) I do not at all
2	Did you still enjoy the things you used to enjoy?	1) Enjoy like before 2) Enjoy but somewhat reduced 3) Enjoy very little 4) No enjoyment at all

3	Did you get a sort of frightened feeling as if something awful is about to happen?	1) I feel very much 2) I feel it 3) I feel little 4) I do not at all
4	Can you laugh and see the funny side of things?	1) Very many times 2) Many times 3) Sometimes 4) I do not at all
5	How often worrying thoughts go through your mind?	1) Very many times 2) Many times 3) Sometimes 4) Rarely
6	Do youfeel cheerful?	1) Not feel cheerful at all 2) Not feel cheerful very many times 3) Sometimes feel cheerful 4) Feel cheerful very many times
7	Can you sit at ease and feel relaxed?	1) Always I can do 2) Very often I can do 3) Often I can't do 4) I can't do at all
8	Do you feel as if you slowed down while you work your routine daily works?	1) Very many times 2) Many times 3) Sometimes 4) I do not at all
9	Do you get a sort of frightened feeling like 'butterflies' in your stomach?	1) I do not get at all 2) Sometimes 3) Many times 4) Very many times

10	Have you lost interest in your appearance?	1) Yes I lost interest at all 2) Do not give as I need 3) Interested in my appearance like before but reduced very little 4) Interested in my appearance like before
11	Do you feel restless as if you have to be on the move?	1) I feel restless very many times 2) I feel restless Many times 3) I do not feel restless this much 4) I do not feel restless at all
12	Do you look forward with enjoyment to things?	1) Yes I look forward like before 2) I look forward like before but reduced very little 3) I look forward reduced than before 4) I do not look forward at all
13	Do you get sudden feelings of panic?	1) I feel very many times 2) I feel many times 3) I do not feel this much 4) I do not feel at all

Annexes2: Transelated Questioners:

በሀላባልዩወረዳየሳባነቀርሳህሙማንከሀኪምበተሰጣቸውትዕዛዝመሰረትህክምናቸውንመከታተላቸውንናያጋጠማቸውንችግሮችለማጥ ናትየተዘጋጀመጠይቅ:

መ ግቢያ

በቅድሚያ ወደ መጠይቁ እንኳን ደና መጡ!

ሥሜ----------ይባላል፡

የሳንባ ነቀርሳ መድኃኒቶች አወሳሰድና መድኃኒቶችን በሀኪም በታዘዘው መሰረት አለመጠቀም ችግርን ለማጥናት ነው የመጣሁት

በመጠይቁን ላይ ስምም ሆነ የራሱን ማንነት የሚገልጽ ማንኛውም ነገር አይጠቀስም በመጠይቁ ወቅት መመለስ የማይፈልጉትን ማንኛውንም ዓይነት ጥያቄ መተው ወይም በማንኛውም ሰዓት መጠይቁን ማቋረጥ ይችላል::ሆኖም ግን ከእርሱ የሚገኘው መረጃ ወደፊት ለበሽታውም ሆነ ስለምንጠቅምባቸውመድኃኒቶች የማስተካከያ እርምጃ ለመውሰድ ሆነ ለሚደረግ ቀጣይ ክትትል ጠቃሜታ ስላለው ለሚሰጡት መረጃ ትክክልነትና ለትብብሮ ምስጋናችን ከልብ የመነጨ ነው

ለሚሰጡት መረጃ ሚስጥራዊነቱ የተጠበቀ መሆኑን በድጋሚ ላረጋግጥሎት እፈልጋለለሁ ለመጠይቁ ፈቃደኛ ኖት ? አዎ ከሆነ ወደ ሚቀጥሉት ጽለፍ/አልፈልግም ከሆነ አመስግነው መጠይቁን አቋርጡ::

የመረጃ ሰብሳቢ ስም----------

ፊርማ----------

የመጠይቁ መለያ ቁጥር----------

መጠይቁ የተካሄደበት ቀን----------

መጠይቁ የተካሄደበት ቀበሌ----------

የጥናቱ ተቆጣጣሪ ስምና ፊርማ----------

<u>ማሰሰቢያ</u>

እያንዳንዱ መጠይቅ በዚህ ሁኔታ መሞላት አለበት

የተጀመረበት ሰዓት----------

ያለቀበት ሰዓት----------

1. የተጠያቂው ፆታ1. ወንድ 2. ሴት
2. የትኛው ቤሄረሰብ አባል ኖት

1. ሀላባ

2. ሲልጤ

3. ከንባታ

4. አማራ

5. ጉራጌ

6. ሌላም ይጠቀስ_____

3. የትዳር ሁኔታ ምንድነው ?

1. ያገባ/ች

2. ያላገባ/ባች

3. የፈታ/ታች

4. የትዳርጓደኛየሞተበት/ባት

4. ሀይማኖት ምንድነው ?

1. ሙስሊም

2. ኦርቶዶክስ

3. ካቶሊክ

4. ፕሮቴስታንት

5. ሌላ----------

5. ስራ ምንድነው ?

1. አርሶ አደር

2. የቤት እመቤት

3. ተማሪ

4. ነጋዴ

5. የመንግስት ሰራተኛ

6 የቀን ሰራተኛ

7.ሌላም ብለው ይግለጹ

6. የት/ት ደረጃ ስንት ነው ?

1. መጽሐፍና ማንበብ የማይችል

2. መጽሐፍና ማንበብ የሚችል

3 የመጀመሪያ ደረጃ (1-8ኛ ክፍል)

4. ሁለተኛ ደረጃ የተማረ (9ኛ-10ኛ)

5. ፕሪፓራቶሪና ከዚያ በላይ

7 የሚትኖረው የትነው ?1. ከተማ 2. ገጠር

8. የቤተሰብ ብዛት ስንት ነው?_____

9. የወር ገቢ ስንት ነው ?_____

ስለሚኖሩበት አካባቢን በተመለከተ

10. ቤት አሎዎት ?1 አዎ2 የለኝም 3. መልስ የለም

11 ቤቱ የራሱ ቤት ነው ?1)አዎ 2) አይደለም

12. ቤቱ ስንት ክፍል አለው?----------

13.ቤቱ ስንት መስኮት አለው?----------

14. በቤት ውስጥ ስን ሰው ይኖራል?----------

15. ቤትህ ከጤና ተቋም ምን ያህል ይረቃል?----------በኪ.ሜ----------በሰዓት----------በደቂቃ---------

16 ውሃ ከየትነው የምታገኙት ? 1. ከቧንቧ 2 ከኩሬ 3 ከወንዝ 4. ሌላ ካለ----------

17 ቤቱ መብራት አለው ? 1. አዎ 2 አይደለም

18 መፀዳጃ ቤት አለው ? 1. አዎ 2 አይደለም

19 በቤቱ ውስጥ የተገኘው የቤት እቃ ይገኛል?

1. ቲቢ
2. ራዲዮ
3. ሞተር ሳይክል
4. ብስክሌት
5. አህያ ጋሪ
6. ፈረስ ጋሪ
7. መኪና
8. ሌላ ካለ ይጠቀስ----------

የሳንባ ነቀርሳ ዕውቀትን ለመለካት የተቀመጡ መጠይቆች

20 ሳንባ ነቀርሳ በምን እደሚተላለፍ ያውቃሉ? 1. አዎ 2 .አላውቅም

21. መልስ አዎ ከሆነ መተላለፊያ መንገዱ

1. በዘር

2. በወባ ትንሽ

3. በሽታው (በሳንባ ነቀርሳ) በሰው አክታ በአቧራ) ከአየር ጋር አንድ ላይ ወደ ውስጥ ስናስገባ ነው

4. በግብረስጋ ግንኙነት

5 በሲጋራ ማጨስ

21. ከሳንባ ነቀርሳ በሽታ መዳን መዳን ይቻላል ብለው ያስባሉ ? 1. አዎ 2. አይደለም

22.መልስ በጥያቄ 21 አዎ ከሆነ በምን መልኩ መዳን ይቻላል?

1. ወደ ባህላዊ ሀኪም ሄደ ህክምና መወሰድ
2. ወደ ጠንቆይ ቤት በመሄድ ጠንቃይ በሚከረው መድኃኒት
3. ወደ ሀኪም ቤት በመሄድ መድኃኒቱን በመውሰድ መታከም

23. የሳንባ ነቀርሳ ምልክቶች ምንድነው?

1. ደም ያለበት አክታ ከሁለት ሣምንት በላይ ማሳል

2. ማንቀጥቀጥ

3. ማታማታ ላብ ላብ ማለት

4. ክብደት መቀነስ

24. የሳንባ ነቀርሳ በሽታ መዳን የሚቻለው መድኃኒቱን ለስንት ወር ሲወሰድ ነው?

1. ለአንድ ወር

2. ለሁለት ወር

3. ለአራት ወር

4. ለስድስት ወር

25. የሳንባ ነቀርሳ መድኃኒት ጥቅሙንና ጉዳቱን ያውቃሉ? 1. አዎ2. አይደለም

26. መልስ በጥያቄ ቁጥር 25 አዎ ከሆነ ጥቅሙ ምንድነው?

1. ከበሽታው ይፈወሳል 2.ክብደትመጨመር 3 ዕድሜ

27. የሳንባ ነቀርሳ መድኃኒት ጉዳቱ ምንድነው የመድኃኒቱ ጎንዮሽ ጉዳት ምድነው? ከሚከተለው

አዎ አይደለም እያሉ እንዲመለስ ይደረግ

1. ሆድን ያሳምማል Gastrointestinal disconfert
2. መገጣጠሚያ ያሳምማል
3. የሽንት ቀለም ይቀይራል
4. የአይን ቀለም ይቀይራል
5. ትኩሳትና የሰውነት ቁስለት ያመጣል

29. ስለ ሳንባ ነቀርሳ መረጃ ያገኘው ከማን ነበር?

1. ከጤና ኤክስቴንሽን ባለሙያ

2. ሬድዮ

3. ከጤና ባለሙያ (ነርስ ፣ሀኪም፣Ho)

4. ሌላም ካላ ይጠቀስ

30.የሳንባ ነቀርሳ መድኀኒት ያልወሰዱበት ቀን ነበር (ያስታወሳሉ)1. አዎ 2. አይደለም 3. አላስታውስም

31.መልስ በጥያቄ ቁጥር 30 አዎ ከሆነ ምክንያቱ ምን ነበር?

1. ረስቼ ነው

2. ዕንቅልፍ ወስዶኝ ነው (በሠዓቱ)

3. መንገድ ሄጄ ነበር

4. መድኃኒቱን በጤና ጣቢያ አጥቼ ነው

5. በሥራ ምክንያት አልተመቸኝም ነበረ

32. መድኃኒት ሲወሰድ የነንዮሽ ህመም ነበር ? 1. አዎ 2.አይደለም

34. መድኃኒቱ የነንዬሽ ህመም ስሜት ሳያስከትል የወሰዱት ዕርምጃ ምን ነበር

1. መድኃኒቱን ወዲያው አቋረጥኩ

2. ሀኪም አማከርኩ

3. እስከ ቀጠሮ ቀን ድረስ አቋረጥኩ

4. መድኃኒቱን በሙሉ ተውኩና በሌላ ጊዜ ጀመርኩ

<u>ከአዕምሮ ጋርተያይዞነትያላቸውመጠይቆችንበሚመለከት</u>

35. መድኃኒቱን እዳይወጡ የሚከለክሎት ነገር አለወይ? 1. አዎ 2. አይደለም

36. የሳንባ ነቀርሳ ህመምተኛ በመሆኑዎ ምክንያት ከቤተሰቦትም ሆነ ከስራ ባልደረባዎች፣ ከዕድር፣ እንዲሁም ከዕቁብ የደረሰቦት መግለል አጋጥሞዎታል? 1. አዎ 2. አይደለም

37. የሳንባ ነቀርሳ ህመምተኛ መሆኑዎን ሌሎች ቢያቁ እገለላለሁ ብለው ያስባሉ? 1. አዎ 2. አይደለም

38. የሳንባ ነቀርሳህመምተኛ መሆኔን ሰዎች ያውቃሉ በሚል ስጋት መድኃኒቱን ከጤና ጣቢያሳይደስዱ የቀሩበት ጊዜ ነበር?1. አዎ 2. አይደለም

39. ከሳንባ ነቀርሳ መድኃኒት ወጪ ለሌላ በሽታ የሚወስዱት መድኃኒት ነበር? 1. አዎ 2. አይደለም

40. አንተ የሳንባ ነቀርሳ ህመምተኛ በመሆንህ ምክንያት በቤተሰቦችህ ላይ የደረሰባቸው ከህዝብ መገለል ሁኔታ ነበረወይ?

1. አዎ 2. አይደለም

41. ሌላ ሰው ያየኛል በሚል ምክንያት መድኃኒቱን ለመውሰድየተቸገሩበት ጊዜ ነበር ወይ?

1. አዎ 2. አይደለም

42 አንዳንዴ ህመሙ ሻል ሲሎት መድኃኒቱን ሳይወስዱ የሚቀሩበት አጋጣሚ ነበር ወይ?

1. አዎ 2. አይደለም

- **የሚከተሉት ጥያቄዎች በሽተኛው መድኃኒቱን በሀኪም ትዕዛዝ ጋር አጣጥሞ አለመውሰድ ጉዳቱን ለይተው ከማወቅ አንፃር ምን ይመስላልበሚል የቀረቡ መጠይቆች ናቸው፡፡**

43. የሳንባ ነቀርሳ መድኃኒት በሀኪም ትዕዛዝ መሰረት መውሰድ ጥቅሙ ምንድነው ?

1. የተሻለ ኑሮ እንዲኖር ያደርጋል

2. በሰውነታችን በሽበታን እንዲከላከልአቅም ይጨምራል

44. መድኃኒቱን ጨርሶ አለመውሰድ የሚያስከትለው ጉዳት ምንድነው አዎ/አይደለም እያሉ እንዲመለስ ይደረግ

1. መድኃኒትየተላመዳ የሳንባ ነቀርሳ በሽታ እንዲፈጠር ያደርጋል
2. የበሽታ ስርጭት በህዝብ ውስጥ እንዲስፋፋያደርጋል
3. ውድ የህክምና ወጪ ያስከትላል
4. ለሞት ይዳርጋል
5. ከበሽታ ሙሉ በሙሉ እንድንፈወስ ያደርጋል

45. መድኃኒቱን የሚወስዱት ምን ጊዜ ነው

1.ጧት ከቁርስ በፊት

2. ጧት ከቁርስ በኃላ

3. ከምሳ በኃላ

4. አላስታውስም/አላውቅም

<u>የሚከተሉትን መጠይቆች ለበሽተኛው የሚሰጠው ድጋፍን በተመለከተ ይሆናል</u>

45. መድኃኒቱን ለመውሰድ ከህበረተሰቡ ክፍል የሚሰጦት ድጋፍ ነበረ ወይ? 1. አዎ 2. አይደለም አልነበረም

46. መልሱ አዎ ከሆነ የሚሰጦት ድጋፍ ምን ነበረ?

1. የቃል ማበረታቻ /ድጋፍ ብቻ

2. የገንዘብ ድጋፍ

3. የምግብ ድጋፍ

4. ሌላ ዓይነት ድጋፍ ካለ ይጠቀስ----------

47. መድኃኒቱን እንድት ወስድ የሚያስታወስ ሰው ነበር

1. አዎ 2. አልነበረም (አይደለም)

የሚከተሉት ጥቄዎች ከሱስ ጋር ተያያዥነት ያለውን ሁኔታ መለገምገም

48. ከሱስ ጋር ተያያዥነት ያላቸው መድኃኒቶች ይጠቀሙ ነበር ?1. አዎ 2 አይደለም

49. መልሱ አዎ ከሆ የትኛውን ነው የሚጠቀሙት

1. አልኮል መጠጣት

2. ጫት መቃም

3. ሻሻ ማጨስ

4. ሲጋራ ማጨስ

50.በህክምና ላይ እያሉ የምግብ ዕጥረት ገጥሞች ነበር ?

1. አዎ 2.አይደለም

51. መልሱ አዎ ከሆነ ለስንት ጊዜ አጋጠሞት ነበር?

1. ለአንድ ጊዜ

2. ለሁለት ጊዜ

3. ለሦስት ጊዜ

4. አላስታውስም

52. ለስንባ ነቀርሳ በሽታ ከህኪም ከሚታዘዘው መድኃኒት ወጪ ሌላ አለ ብለው /ይገምታሉ ያስባሉ አለ ብለው ያስባሉ

1. አዎ 2. አይደለም

53. መልሱ አዎ ከሆነ ምን የተለየ መድኃኒት አለ ብለው ያስባሉ

1. ባህላዊ መድኃኒት

2. የፀበል ውሃ

3. ባዱግ

4. ሌላ ካለ ይጠቀስ

- **ከመድሃኒት ጋር ተያያዥነት ያላቸው ችግሮች ለመለየት የቀረቡ መጠይቆች**

54. መድኃኒቱ የጎንዮሽ ጉዳት አለው ብለው ያስባሉ

1. አዎ አለው 2. አይደለም የለውም

55. የፀረ ኤች አይቪ መድኃኒት ይወስዳሉ?1. አዎ. ወስዳለሁ2. አይ አልወስድም

56. የተለያዩ መድኃኒቶች ለተለያዩ በሽታዎች በአንድ ጊዜ በሀኪም መታዘዛቸው አስጨንቆት ያውቃል? 1. አዎአስጨንቆኛል 2. አይ አላስጨነቀኝም

ከጤና ተቋማት ጋር ተያያዥነት ያላቸው ችግሮች ለመለየት የቀሩ መጠይቆች

58. መድኃኒት ከጤና ተቋማት ለማምጣት የሚጓዙት በምንድነው

1. በእግር

2.በፈረስ/በበቅሎ

3. በህዝብ መኪና

4. ሌላም ካለ ይጠቀስ

59. መልሱ በእግር ነው የምጓዘው ካሉ ምክንያቱ ምን ነበር

1. የህዝብ ትራንስፖርት ወድ ስለሆነ

2. የህዝብ ትራንስፖርት አይገኝም

3. ሌላም ካለ ይጠቀስ

60. ወደ ጤና ተቋም በሚሄዱበት ወቅት ሁሌም መድኃኒቱን በሠዓቱና በሚፈለግበት መጠን ያገኙ ነበር?

1. አዎ አገኝ ነበር 2. አይደለም አላገኝም ነበር

61. መድኃኒቱን ከመጀመሮ በፊትም ሆነ ከጀመሩ በኃላ በጤና ባለሙያ በኩል ስለ መድኃኒቱ ጥቅምና ጉዳት የምክር አገልግሎት አግኝተው ነበር? 1. አዎ አግኝቼ ነበር 2. አይደለም አላገኘውም ነበር

62. መልሱ አዎ ከሆነ ለስንት ጊዜ የሀኪም ምክር አገልግሎት አግኝተዋል?----------

63. መድኃኒቱንለማግኘት ወደ ጤና ጣቢያ ከሄዱ በኃላ ለምን ያህል ጊዜ ይቆያሉ (መድኃኒቱን)--- በደቂቃ/--- በሰዓት.

64. በጤና ጣቢያ /በሆስፒታል በሚያገኙት የህክምና አገልግሎት ረክተዋል?1. አዎ ረክቻለሁ 2. አይደለም አረካሁም

- **ከጤና ባለሙያ ጋር ተያያዥነት ያላቸው ችግሮችን ለመለየት የቀረቡ ጥያቄዎች**

65. መድኃኒት የሚሰጠው ወይምህክምና የሰጡት ባለሙያ ሚስጥሮን ይጠብቃል ብለው ያምናሉ? 1. አዎ አምናለሁ 2.አይደለም አላምንም

66. የጤና ባለሙያ የሚነገረውን ይሰማኛል ብሎ ያምናሉ? 1. አዎ ይሰማኛል አይደለም አይሰማኝም ትኩረት ሰጥቼ አላዳምጥም

67. ሀኪሙ/የጤና ባለሙያው) የምክር አገልግሎት ሲሰጥ በተለየ ክፍል ውስጥ ለብቻዮ ነው

1. አዎ ለብቻዮ በተለየ ክፍል ውስጥ ነው

2. አይደለም ሌላ ሰው ባለበት ነው

68. የጤና ባለመያው ስለ በሽታ ሁኔታ እንዲጠይቁ ዕድል ይሰጦታል

1. አዎ ይሰጠኛል 2. አይደለም አይሰጠኝም

የጤና ባለሙያ በተመለከተ

69. ከሚያክሞት ሀኪም ጋር ወይም ከሌሎች የጤና ባለሙያዎች ጋር ካሎት ግኑኝነት ረክተዋል?

1. ረክቻለሁ 2. አልረካሁም 3. እኔ እንጃ

70. የሚያክሙት ጤና ባለሙያ ብቁ ናቸው ብሎው ያምናሉ በእነሱስ ላይ አመኔታአሎት?

1. ብቁ ናቸው አመኔታ አለኝ

2. ብቁ ናቸው አላምኒም

3.ብቁ አይደለምአመኔታየለኝ

71 .ከሚያክሞት ጤና ባለሙያ ግልጽ የሆነ መግባባት አሎት

1. አለኝ 3.አላወኩም

2. የለኝም

72. ቀጠሮ በየስንት ጊዜው ነው ወሩ ? 1. በየሳምንቱ 2.

DECLARATION

I, the undersigned, declare that this thesis is my original work, has not been presented for a degree in this or any other university and that all sources of materials used for the thesis have been fully acknowledged.

Name: MUHAMMED AHMED RAMETO

Signature: _____

Name of the institution: JIMMA UNIVERSITY

Date of submission: _____

This thesis has been submitted for examination with my approval as University advisor

Name and Signature of the first advisor

1. Professor Kifle Woldemichael (MD, MPH)

_____

2. Wondwossen Kassahun (PHD)

_____