



ST. PAUL'S HOSPITAL MILLENNIUM MEDICAL COLLEGE

GRADUATE STUDY PROGRAM

DEPARTMENT OF MEDICAL-SURGICAL NURSING

**Medication Adherence and its Associated Factors among Patients
with Selected Cardiovascular Diseases attending Butajira General
Hospital, Southern Ethiopia, 2023**

By: Zirya Habtu Suleman (BSc)

Addis Ababa, Ethiopia

June, 2023

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By: Zirya Habtu(BSc)

Advisors: Rahel Nega (MSc, PhD Fellow)

Mestawot Wendmu(BSc, MSc, Lecturer)

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Abstract

Introduction: The burden of cardiovascular diseases continues to increase globally. Adherence to medications plays a central role in the therapeutic success of chronic disease patients. However, poor adherence remains a global challenge with various consequences. Although evidence regarding context-specific factors is necessary to devise intervention programs, such data in the study setting are rather scarce.

Objective: To assess medication adherence and its associated factors among patients with selected cardiovascular diseases attending Butajira General Hospital, Southern Ethiopia, 2023

Methods: An institution-based, cross-sectional study was conducted at Butajira General Hospital. A systematic random sampling technique was used to recruit patients with cardiovascular diseases having follow up at the hospital. Data were collected using a pretested questionnaire, and adherence was assessed with Morisky Medication Adherence Scale (MMAS-8). The collected data were entered into Epi-info version 7.2.2.2, and then analyzed using SPSS version 26. Descriptive statistics such as mean±standard deviation, and percentages (frequencies) was used to summarize the background characteristics and adherence levels. Multivariable logistic regression was employed to identify factors associated with medication adherence. Crude and adjusted odds ratio with 95% confidence intervals were computed, and a p-value <0.05 was considered significant. Texts, tables and figures were used to present results.

Results: A total of 375 out of 381 patients completed the questionnaire, giving a response rate of 98.4%. Most (89.1%) had hypertension and 41 (10.9%) had cardiac disorders. Overall, about one-fourth (25.3%;95) were adherent while the majority (74.7%;380) were non-adherent. According to multivariable regression, lack of enrolment to health insurance (AOR: 2.38, 95%CI (1.29,4.40)), presence of sleep disturbance (AOR: 3.09, 95%CI (1.66,5.76)), lack of in-facility medication availability (AOR:16.33, 95%CI (8.64,30.84)), and lack of counselling (AOR: 2.73, 95%CI (1.53,4.87)) were the factors significantly associated with non-adherence among the patients.

Conclusion: Three-fourths of patients with cardiovascular diseases had medication non-adherence, which was found to be associated with lack of enrolment to health insurance, presence of sleep disturbance, lack of in-facility medication availability, and lack of counselling.

Keywords: Cardiovascular diseases, Medication adherence, Butajira Hospital, Ethiopia

Abbreviations

BGH	Butajira General Hospital
CBHI	Community Based Health Insurance
CVD	Cardiovascular Disease
LDL	Low-density-lipoprotein
LLD	Lipid Lowering Drug
MMAS	Morisky Medication Adherence Scale
MNA	Medication Nonadherence
NCD	Noncommunicable disease
OSSS	Oslo Social Support Scale
PDC	Proportion of days covered
SSA	sub-Saharan Africa
SPHMMC	St. Paul's Hospital Millennium Medical College
SPSS	Statistical Package for Social Sciences

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1. Introduction

1.1 Background

Cardiovascular diseases (CVDs) include a range of disease entities and pathologies that affect the cardiovascular system and its supporting structures. The category of CVD include (but are not limited to) hypertension, coronary heart disease, heart failure, angina, peripheral arterial disease, and deep vein thrombosis (DVT) (1). Together, they represent major cause of death globally, accounting for approximately one-third of all deaths worldwide(2).Over the last two decades, Africa, the same period, their prevalence showed a sharp growth larger than 50% across Africa (3). Their corresponding prevalence in Ethiopia ranges from 1 to 20%, with an overall prevalence of 5%(1).The treatment of CVDs primarily depends on the long-term use of pharmacotherapy and adherence to these medications(4,5).

Adherence has been widely defined as the degree to which an individual's behavior—taking medication, following a diet, and/or executing lifestyle changes—corresponds with agreed upon recommendations from a healthcare provider(6). Specifically, medication adherence refers to the patient's ability and willingness to comply to recommended health practices regarding pharmacological management (7). Such adherence to prescribed medications, among persons living with cardiovascular diseases, has long been considered crucial in terms of disease management, mortality reduction and achievement of optimal health (2,6,8,9).

Adherence is a multifaceted issue, and it plays a key role in the therapeutic success, assuming the prescription is appropriate and correct(10). Despite the availability of effective CVD medications, medication non-adherence remains a pervasive global threat (5). Again, although pharmacological therapies are known to be highly effective in management of these diseases, their full benefits are often not adequately exploited as about half of patients with cardiovascular disorders do not take their medications as prescribed (11,12). Non-adherence to medication for cardiovascular diseases was estimated to be alarmingly high, reaching up to 60%.In particular, non-adherence rate ranges from 27% in patients with acute coronary syndrome (ACS) at 1 week after discharge to 34% at 1 month following ACS (4). Among patients with ischemic heart diseases, only 43% were adherent to pharmacological therapy (13).

Medication adherence is not satisfactorily adequate among cardiovascular patients as it is affected by several factors such as culture, life habits, chronicity of the disease, side effects of drugs, patient's satisfaction with the healthcare system, income and lack of medical insurance

(6,14–16). Grossly, medication adherence was associated with disease factors, therapy factors, healthcare factors, patient factors and social factors (9). Particularly, it is influenced by factors such as lack of information, complexity of regimen, concomitant disease, and perceptions of benefit, medication cost, and emotional wellbeing among patients with CVDs (16). Such medication non-adherence to cardiovascular medications inevitably results in suboptimal disease control, with increased morbidity and mortality and healthcare costs (5,11).

In Ethiopia, adherence to cardiovascular medications was observed to be vary across settings, standing at 60% in southwest Ethiopia (14) and 75.1% in northwest Ethiopia(17). About a quarter (23.7%) of patients with heart failure were medication non-adherent in northwest Ethiopia(18). Thus, although a number of studies have tried to demonstrate the prevalence of, and factors associated with, cardiovascular diseases (chiefly focusing on hypertension) in Ethiopia(11,19–23), there is minimal information regarding the level of medication adherence and its associated factors among patients with cardiovascular diseases in the current study area. Hence, this study aimed, using a cross-sectional research design, to describe medication adherence among individuals with cardiovascular diseases, focusing on adherence profiles to cardiovascular medication, and explore factors determining it, in the case of cardiovascular patients attending Butajira General Hospital, Southern Ethiopia.

1.2 Statement of the problem

In general, cardiovascular diseases (CVDs) are the major cause of disability and premature death globally, making them alarming public problems (24). In particular, the prevalence of CVDs, including hypertension and heart failure, in adults ≥ 20 years of age is 49.2% (126.9 million in 2018) (25). Even worse, following a number of complex factors such as unhealthy lifestyles (26), their prevalence continued to increase, with a threatening rate and detrimental consequences in developing regions of the world (27). CVDs produce immense health and economic burdens globally, the annual direct and indirect cost reaching 378 billions of dollars in some countries (25). Apart from its steadily growing prevalence, the highest age-standardized rates of disability-adjusted life years (DALYs) due to hypertensive heart disease are observed in Africa (24).

Suboptimal adherence to prescribed medication is a significant factor in CVD management and control associated with increased risk of poor CVD outcomes and complications (2). Poor adherence has been shown to increase the risk for frequent hospitalization and early mortality (28). Among hypertensives, non-adherence was found to be a risk factor for the development of a hypertensive crisis (29). Unfortunately, despite increased awareness and advances in pharmacotherapy, poor adherence to treatments for chronic diseases remains a global problem (10). For instance, an estimated 100 billion dollars is spent annually on American healthcare services that are directly attributed to poor medication adherence (30). A very high frequency of poor adherence was reported among African patients with cardiovascular diseases, with two-thirds having inadequate adherence to antihypertensive medications (26).

In the case of hypertension, suboptimal adherence, which includes failure to initiate pharmacotherapy, to take medications as often as prescribed, and to persist on long-term therapy, is a well-recognized factor contributing to the poor control of blood pressure (31). The level of poor anti-hypertensive medication adherence was remarkably high (63%) in Eastern Ethiopia (32). In settings like Ethiopia, on the background of poverty-related limited access to demanded medications and fixed drug regimens, non-adherence to medication continued to impact the personal and economic dimensions of patients, resulting in deterioration in patients' health in one way or another (11). As a measure to address adherence issues, developed countries started to use a medication event-monitoring system (MEMS) device, an electronic monitoring system that can be utilized to assess adherence objectively (33). In developing countries such as Ethiopia, patients are often health educated during their clinical visits both

individually and collectively. Again, in some centers, pamphlets targeting at dietary and drug adherence are distributed. However, adherence remains of special concern in the study settings.

Moreover, such suboptimal adherence features can be modified by intervention mechanisms targeting at the potential contextual factors. And for this to successfully happen, context-specific empirical evidences are required. Despite this, there is paucity of data peculiar to the present study setting. Thus, in this sense, the current study is conceived to capture medication adherence status among individuals with cardiovascular diseases and explore factors determining it, in the case of patients with cardiovascular diseases attending Butajira General Hospital, Southern Ethiopia.

1.3 Significance of this study

There are only limited data regarding medication adherence in patients with CVDs, and hence this study would provide context-specific picture regarding enabling and deterring factors of adherence. It will also determine the factors that affect adherence in the study setup so that it will add an input to the existing knowledge. As a consequence, this study will provide a momentous input in designing quality improvement project that would target at enhancing treatment adherence, by identifying key areas of intervention. Moreover, the findings of this study could serve as an additional database for future research undertakings focusing on improving medication adherence.

2. Literature review

2.1 Medication adherence among cardiovascular patients

Between January 2014 and November 2015, Macquart along with a multidisciplinary team conducted an observational cross-sectional study during outpatient consultations in cardiology departments of 29 hospitals from 17 cities across 12 sub-Saharan African countries. The study included 2198 adult hypertensive individuals, and among these, 678 (30.8%), 738 (33.6%), 782 (35.6%) participants had low, medium and high adherence to antihypertensive medication, respectively (26).

In the period between February and March 2018, a facility based cross-sectional study was done among 260 patients with non-communicable diseases (NCDs) receiving treatment from rural primary health center in Puducherry, South India. Majority of the patients were suffering from hypertension (71.2%) and diabetes (56.2%). This study documented that about one-third (32.7%) of the patients with NCDs were not properly adherent to medications (34).

On the other hand, in the year 2015–2016, Norwegian authors sought to describe medication adherence to lipid-lowering drugs (LLDs), antihypertensive drugs, and acetylsalicylic acid (ASA) among persons with coronary heart disease (CHD) and explore its association with low-density-lipoprotein (LDL)-cholesterol, and systolic and diastolic blood pressure. The authors calculated medication adherence as the proportion of days covered (PDC) for persistent prevalent users in the period of 365 days before the attendance date. Accordingly, mean PDC was 0.94 for LLDs and antihypertensive drugs and 0.97 for ASA. Among persons with $PDC \geq 0.80$ for LLDs, 12.0% had an LDL-cholesterol < 1.8 mmol/L. Blood pressure $< 140/90$ mmHg ($< 140/80$ mmHg if diabetes patient) was reached by 55.1% of those with a $PDC \geq 0.80$ for antihypertensive drugs (35).

In 2013, Aggarwal and others carried out qualitative and quantitative pilot study conducted among American heart failure patients and their informal caregivers. In this study, medication adherence and hospitalization rates were assessed among patients at 30-days post-clinic visit by mailed survey. At baseline, 60% of patients reported sometimes forgetting to take their medications. At 30-day follow-up, half of patients reported non-adherence to their medications, while 1 in 10 reported being hospitalized within the past month (36).

In United Kingdom, a cross-sectional, postal survey-based study of the medicines-taking experience of 503 patients with coronary artery disease treated at a secondary/tertiary care centre. The rate of non-adherence to at least one secondary prevention medicines was 43.5%

(n=219), but 53.3% of reported non-adherence was to only one secondary prevention medicines. Statins contributed to 66.7% and aspirin to 61.7% of overall non-adherence identified by the Single Question (SQ) tool. In 30.8% of non-adherent patients (n=65), this was at least partly intentional (37).

From September 2015 to September 2019, a large cross-sectional multi-center study was conducted among 2420 hypertensive patients attending the out-patient cardiac clinics at three different university hospitals in Upper Egypt. The study assessed medication adherence composed of 8 items, which had a 4-point Likert scale. Accordingly, of the 2420 patients studied, it was found that 1116 (46.12%) patients were adherent to medications while 1304 (53.88%) were non-adherent(15). In Iran, a cross-sectional study was conducted on 300 patients with heart failure who were hospitalized from January to March 2015. Using the MMAS, the mean score of treatment adherence was 5.82 ± 2.54 among these cohorts(38).

In Minna, North Central Nigeria, a hospital based cross-sectional study was conducted among 237 hypertensive patients between February and May 2018. Using the Morisky Green Levine Scale, the study showed that the overall adherence of participants to medication was low, with adherence level of 39.2% (20). In Dar es Salaam, Tanzania, a prospective cohort study among hospitalized heart failure patients in Jakaya Kikwete Cardiac Institute (a tertiary care public teaching hospital) between March and October 2018. Among the 459 patients enrolled in the study, 313 (74.7%) had poor adherence and 106 (25.3%) had good adherence(28).

A cross-sectional study involving 202 previously diagnosed heart failure patients attending an outpatient clinic in Lagos University Teaching Hospital (LUTH), Nigeria was done by Ale et al. in 2020. The authors tried to determine medication non-adherence (MNA) using Medication Adherence Report Scale 5-items. The overall prevalence of MNA was 69.3% with ACE inhibitors having the highest MNA of 73.2% and angiotensin receptor blocker/neprilysin inhibitor having the least MNA of 0%(39).

In Sudan, a descriptive cross-sectional study was conducted on 202 hypertensive patients with cardiac disease who attended the referred clinic at Alshaab Teaching Hospital from November 5th to December 7th, 2017. The study assessed adherence using Morisky Medication Adherence Scale, revealing that 41.6% of the patients were non-adherent to their antihypertensive medications (22). Prior to this, another cross-sectional Sudanese study surveyed 386 randomly selected cardiac patients attending the largest three cardiac centres located in Khartoum State.

The study found 49% of patients had optimal adherence, scoring greater than six on the eight-item MMAS (40).

A hospital-based cross-sectional study among adult hypertensive patients was conducted at hypertensive follow-up clinic of Jimma University Specialized Hospital from March 4, 2015 to April 3, 2015. Adherence was assessed using Morisky Medication Adherence Scale-8 (MMAS-8). Among 280 hypertensive patients, good adherence was documented in 61.8% of the patients (41). Recently, between February and May 2018, an institution-based case-control study was conducted by Getenet and others on a sample of 289 adult hypertensive patients on follow-up in Hawassa Referral Hospital, using MMAS-8 adherence assessing tool. The study found adherence to medication to be 67% (21).

From 1 January to 30 February 2022, another hospital-based, cross-sectional study was conducted in Harari regional state and Dire Dawa Administration (Eastern Ethiopia). The study included a total of 402 adult hypertensive patients who visited the chronic diseases clinic for follow-up. The study documented poor medication adherence during the COVID-19 pandemic, standing at 63% (32). Besides, a cross-sectional study was conducted among 245 adult patients with HF at the University of Gondar Comprehensive Specialized Hospital, Northwest Ethiopia from June to August 2017. The authors assessed adherence using the Medication Adherence Report Scale (MARS-5), and they found that about a quarter (23.7%) were medication non-adherent(18).

A hospital-based, prospective, cross-sectional study was conducted on 423 heart failure patients having follow up at Tikur Anbessa Specialized Hospital, Addis Ababa, Ethiopia. Majority of the patients studied were in NYHA class III (55.6%), and noncompliance was observed in more than a quarter of the patients (26.2%) (42).

2.2 Factors associated with medication adherence

The former cross-sectional survey conducted over 12 SSA countries found that the use of traditional medicine and individual wealth index were significantly and independently associated with poor adherence to medication. In addition, 26.5% of these African patients admitted having stopped their treatment due to financial reasons and this proportion was 4 fold higher in the lowest than highest wealth group (26). In the case of United Kingdom, modifiable factors associated with overall non-adherence included being prescribed aspirin, having specific concern about secondary prevention medicines and issues with repeat prescriptions (37).

In the previous Indian study, elderly and female patients with NCDs were found to have more odds of being non-adherent to medications (34). On the other hand, adherence to LLDs was associated with lower LDL-cholesterol, while neither systolic nor diastolic blood pressure was associated with adherence to antihypertensive drugs among Norwegian population (35). In American context, the most common factors associated with non-adherence included forgetfulness (50%), having other medications to take (20%), and being symptom-free (20%) (36).

Tantikosoom and colleagues included 160 randomly selected patients, with cardiovascular disease, from public primary hospital in rural, central Thailand. The authors, through their hierarchical multiple regression analysis model, revealed the presence of co-morbidities, secondary education and male gender together explained 16.3 % of the variance in predicting medication adherence among patients with cardiovascular patients (7). On the other hand, Amininasab and other Iranian authors reported that medication adherence had a significant association with education level, number of children, comorbidity, ejection fraction, and the number of tablets used per day (38).

Between July 2016 and March 2018, Alalaq and others studied three hundred and three Iraqi patients with cardiovascular disease to assess medication adherence using MMAS-8 and determination of drug concentrations in patient dried blood spot (DBS) samples by liquid chromatography-high resolution mass spectrometry. In the study, medication adherence was 81.8% in comparison with 50.8% obtained using the laboratory-based microsample analysis (43).

Kumar and colleagues conducted a qualitative study among patients with congestive heart failure and coronary heart disease who attended the special outpatient department (SOPD) clinic at SSH from January 1, 2019 to December 31, 2019. In the study, eight themes were identified as factors affecting noncompliance with medication: scarcity of knowledge, patients' negative attitudes, poor family support, financial constraints, forgetfulness, irregular clinic attendance, heavy alcohol use, and alternative treatment vs pharmaceutical medication(44). In the context of Iraq, adherence was significantly associated with the number of medications in the patient's treatment regimen (43).

The Egyptian study demonstrated many factors that could predict good adherence to antihypertensive drugs, including young age, urban residence, a smaller number of pills, absence of comorbid conditions, high income, and high education level (15). Awad and others,

in their previously cited article, added that patients with a high level of education, low and middle income levels, and those taking five or more medications daily were found to be significantly more non-adherent to medication use than those with low to intermediate education levels, those with high income levels, and those taking one to four medications daily (40).

In the previous Nigerian report, Usman et al., medication adherence was remarkably higher in younger patients (74.2%) and among females (52.7%). Similarly, adherence was more among those who took ≥ 3 pills (73.1%) and those who received pharmacist counseling (82.8%) (20). Besides, possession of a health insurance was found to be the strongest associated factor for adherence in Tanzanian setting (28). Among Sudanese patients, non-adherence was found to be significantly associated with using more than one pharmacy to get the medications, young age, and high level of education (22). Contrary to this, Ale et al. observed that MNA was independent of age, gender, educational status, number of medications, duration of HF, history of HF admission, functional status, and specific comorbidities (39).

Asgedom et al. reported that co-morbidity, alcohol intake, getting medications freely and combination of antihypertensive medications were inversely associated with antihypertensive medication adherence (41). In southern Ethiopia, adherence was found to be better in younger age (<45), clients living in urban areas, those clients who had good knowledge, those with no co-morbidities, and patients who controlled their blood pressure (21). In eastern Ethiopia, lack of formal education, existing co morbidity, self-funded for medication cost, poor knowledge about hypertension (HTN) and its treatment, poor patient–physician relationship, and unavailability of medication showed significant association with poor medication adherence during the pandemic of COVID-19 (32). Seid et al. found that presence of comorbidity, taking three or more types of medication, and being unmarried were the factors significantly associated with medication non-adherence (18).

In rounding up, the reviewed literature demonstrated that poor adherence is multifactorial, and is one of the chief problems in therapeutic control of cardiovascular diseases. The adherence level varied among different geographic settings, with institutional, personal, health care related factors affecting it. Moreover, it was also pointed out that the existing literature main focused on patients with hypertension, not inclusive of other cardiovascular diseases, justifying the present study.

2.3 Conceptual framework

The framework depicted in Figure 1 was adapted from reviewed existing literatures (7,20,26,32,36,45). It tries to figure out the potential factors and the likely plausible interdependence that could potentially affect medication adherence among patients with CVD and it is supposed to support the present study.

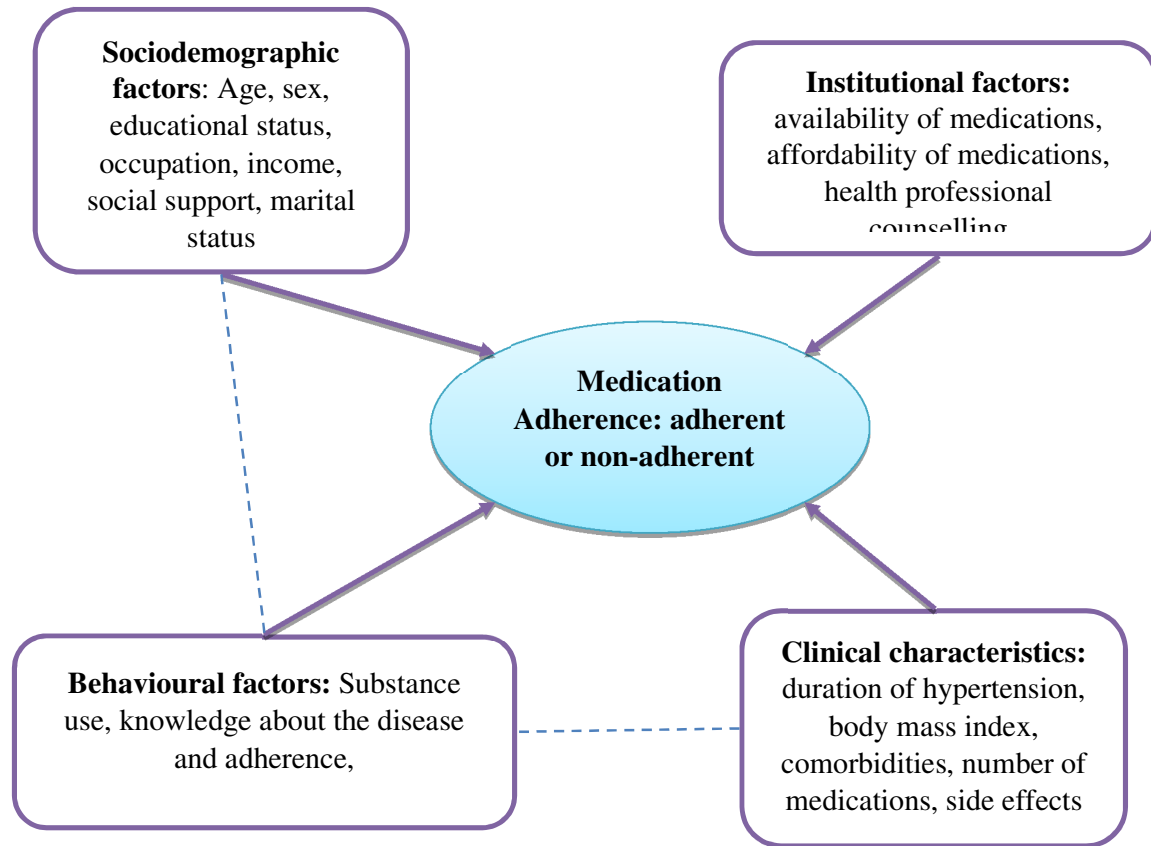


Figure 1. Conceptual framework for factors affecting medication adherence among cardiovascular patients (Source: (7,20,26,32,36,45))

3. Objective of study

3.1 General objective

- To assess medication adherence and its associated factors among patients with selected cardiovascular diseases attending Butajira General Hospital, Southern Ethiopia, 2023

3.2 Specific objectives

- To determine medication adherence among patients with selected cardiovascular diseases attending Butajira General Hospital, Southern Ethiopia, 2023
- To identify factors associated with medication adherence among patients with selected cardiovascular diseases attending Butajira General Hospital, Southern Ethiopia

4. Methods and Materials

4.1 Study area

The study was carried out at Butajira General Hospital (BGH), Butajira, Ethiopia. The town is situated 130 kilometres south of the capital, Addis Ababa. The town is located in the Gurage Zone of the Southern Nations, Nationalities, and Peoples' Region, one of the eleven regional divisions of the country. The town is bordered Southwest by Hadiya and Yem special woreda, on the West, North, and East by Oromia Region, and on the Southeast by Silte zone (46).

The hospital provides a variety of clinical services for the inhabitants of the town and its surrounding communities, serving approximately 1.6 million population dwelling in its catchment area. The hospital has seven wards with a total of 145 beds for inpatient services. The health services include Emergency, Gynecology/Obstetrics, Surgery, Antenatal Care and Family Planning, Pediatrics (including a malnutrition program), a Tuberculosis Unit, Anti-Retroviral Therapy (ART) Orthopaedic service, Psychiatry service and Dental Care. The hospital has outpatient department, focusing on ambulatory patients having chronic illnesses communicable and noncommunicable diseases. There are two chronic OPDs dedicated to noncommunicable diseases such as cardiovascular diseases at which the current study is aimed. Currently, there are about 824 patients with CVDs having a regular follow up at the OPDs.

4.2 Study period

Data were collected from patients with cardiovascular diseases visiting Butajira General Hospital (BGH) between March 1st and April 30th, 2023.

4.3 Study design

An institution-based, cross-sectional study design was used.

4.4 Population

4.4.1 Source population

All patients with selected cardiovascular diseases having regular follow up at BGH

4.4.2 Study population

Randomly-selected patients with selected cardiovascular diseases having regular follow up at BGH within the study period

4.5 Eligibility criteria

4.5.1 Inclusion criteria

- Adult patients (age ≥ 18 years) with selected cardiovascular disease diagnosed by a health care professional
- Patients on pharmacological treatment for at least 3 months before the study period

4.5.2 Exclusion criteria

- Seriously ill patients

4.6 Sample size determination

The sample size for this study is calculated using a single population proportion formula. Taking the population proportion of cardiovascular patients having good adherence to be 61.8% from the previous Ethiopian report done at Jimma (41):

$$n = \frac{z^2 p(1-p)}{e^2}$$

n = the required sample size

p = the proportion of cardiovascular patients with good adherence=0.618

$Z_{\alpha/2}$ = the critical value at 95% confidence level = 1.96

e = precision (margin of error) = 5%

Accordingly,

$$n = \frac{(1.96)^2 * 0.618(1 - 0.618)}{0.05^2}$$

$$n = \frac{(1.96)^2 * 0.618(0.382)}{0.05^2}$$

$$n = 363$$

Adding 5% of non-response rate to the calculated sample size, the final sample size required for this study becomes 381 patients.

4.7 Sampling technique

By the time of the study, there were a total of 824 adult patients with cardiovascular diseases (that is, hypertension, coronary heart disease, and heart failure) having follow up in the chronic outpatient clinics of BGH. Since the required sample size is 381, systematic random sampling technique was employed, with K being 2. Thus, every other patient was approached for interview after selecting the first participant randomly with a lottery method.

4.8 Data collection tools and procedures

Data were gathered by means interviewer-administered, structured, pre-tested, Amharic and Guraghe version questionnaire. The data collection tool is adopted from previous similar studies(28,41,47,13,48). It is composed of five parts. The first and second parts focus on socio-demographic characteristics (including age, sex, educational status, occupational category, smoking status and alcohol consumption) and clinical details (such as duration of illness, comorbidities, number of medication(s)), respectively. The third section assesses social support using the three-item Oslo Social Support Scale (OSSS-3).

The fourth section explores patients' knowledge related to the disease and therapy as well as institutional factors. The final section measures medication adherence by means of an eight-item Morisky's Medication Adherence Scale (MMAS-8). A scoring scheme of "Yes" = 0 and "No" = 1 for the first seven items except item number five in which the values are of "Yes" and "No" are reversed and for the last item a five-point Likert response is used with options "never", "once in a while", "sometimes", "usually", and "always". For item 8, the possible responses of: 0 = "difficulty remembering always;" 0.25 = "difficulty remembering usually;" 0.5 = "difficulty remembering sometimes;" 0.75 = "difficulty remembering once in a while;" and, 1= "no difficulty remembering." (5,40). Total scores on the MMAS-8 range from 0 to 8, with scores of 8 reflecting high adherence, 7 or 6 reflecting medium adherence, and <6 reflecting low adherence(49). Potential subjects meeting the inclusion/exclusion criteria were approached by the trained data collectors while waiting, in the clinic reception area, to be seen by their respective physicians. Additionally, medical charts were reviewed whenever it is appropriate for clinical details.

4.9 Study variables

4.9.1 Dependent variable

- Medication adherence (adherent or non-adherent)

4.9.2 Independent variables

- Age
- Sex of the patient
- Educational status
- Occupational status
- Household income
- Smoking history
- Alcohol intake
- Drug availability
- Community based health insurance
- Knowledge about the disease
- Social support
- Duration of illness
- Number of medications
- Body mass index
- Comorbidities

4.10 Operational definitions

- **Cardiovascular diseases:** refers to a group of diseases and pathologies that involve the cardiovascular system and its supporting structures (1). In this study, hypertension, coronary heart disease, and heart failure are the selected CVDs.
- **Social support:** psychosocial resource that is accessible in the context of interpersonal contacts, and one's social network, as measured by a 14-point Oslo Social Support Scale. Patients were categorized to have poor social support if they score 3–8, moderate social support if they score 9–11, and strong social support in cases when the score ranges from 12 to 14 (51).
- **Medication adherence:** category of adherence as measured by MMAS-8 such that patients were considered non-adherent to their prescribed medication(s) when they score less than six in the MMAS test, and they were considered to be adherent when the patient's MMAS-8 score is greater than or equal to six(41,49).

- **Good knowledge:** those respondents who score 80% and above of the total knowledge assessing items (≥ 4 correct responses of the five items). On the contrary, those scoring lower were considered as having poor knowledge (52).

4.11 Data processing and analysis

The collected data first were checked manually for its completeness and consistency. Then after, data were entered, coded and cleaned via Epi-info version 7.2.2.2. The entered data were exported and statistically analyzed using IBM SPSS (Statistical Package for Social science) statistics version 26. Cross tabulation and frequencies were used to check for missed value and variables. The data were summarized as a mean $\pm$ standard deviation or as a median $\pm$ interquartile range based on its distribution. Bi-variable logistic regression analyses were run to identify independent factors, and p-value < 0.25 were considered to select candidate variables for the multivariable logistic regression model. Stepwise multivariable logistic regression (with a forward conditional method) was conducted to identify factors associated with adherence to cardiovascular medications. Hosmer and Lemeshow's goodness-of-fit test was used to test the model adequacy. Crude odds ratio (COR) and adjusted odds ratio (AOR) with their 95% confidence interval were computed, and p-value less than 0.05 was considered as statistically significant. Finally, the study findings were presented using diagrams, tables and figures.

4.12 Data quality management

To maintain validity of the data collection tool, a structured questionnaire was developed and translated into local languages (Amharic and Guraghe) and back translated to English. Then, the questionnaire was pretested in 5% of the total sample size in patients out of the study period, namely Wolkite University Specialized Hospital, a hospital with comparable population characteristics to the present study setting. To improve data quality, brief training on the basics of data collection tool was given for two data collectors before the actual data collection process. Close supervision was maintained during data collection and filled questionnaires were double-checked daily for consistency and completeness by onsite supervisors and the principal investigator before proceeding into statistical analysis.

4.13 Ethical consideration

Ethical clearance paper was sought from Institutional Review Board (IRB) of Saint Paul's Millennium Medical College. The paper was submitted to the Medical Director of BGH. Permission letter from the executive bodies of BGH will then be secured to proceed to the

actual data collection process. The purpose of the study was concisely explained for participants and written informed consent was obtained in local language before interviewing the patients. The questionnaires were kept anonymous and confidential.

4.14 Dissemination of the study findings

The results obtained from this study will be submitted to Department of Medical Surgical Nursing of SPHMMC as a partial fulfillment for the Master's Degree of Cardiovascular Nursing as well as the higher officials of BGH. The outcome of this study will be submitted to annual nursing conferences for presentation. Finally, the manuscript will be submitted to a peer reviewed scientific journal for possible publication.

5. Results

5.1 Background characteristics

A total of 375 out of 381 patients completed the questionnaire, giving a response rate of 98.4%; of these, two-thirds (n=249; 66.4%) were 50 years of age or older, and females slightly predominated (51.5%; n=193). Muslims accounted for more than half of the study population (n=209; 55.7%) whereas Orthodox Christians represented more than a third (n=133; 35.75%) (Table 1).

Most of the subjects reported to be married (n=311;82.9%). Close to half (n=160;42.7%) stated not attend any formal education. In terms of occupational status, one-third (n=125;33.3%) were either government or private employees while more than a quarter (n=98;26.1%) were housewives. With regard to average household monthly income, a hundred and eighteen (31.5%) reported to earn not more than 1000 Ethiopian Birr. Majority (n=214;57.1%) were enrolled to community based health insurance (CBHI) (Table 1).

Table 1. Background characteristics of patients with cardiovascular diseases having regular follow up at Butajira General Hospital, Southern Ethiopia, 2023 (n=375)

Variable	Frequency	Percent (%)
Age group		
22–40 years	48	12.8
40–49 years	78	20.8
50–59 years	90	24.0
60–69 years	98	26.1
70–92 years	61	16.3
Sex		
Male	182	48.5
Female	193	51.5
Religion		
Muslim	209	55.7
Orthodox	133	35.5
Protestant	33	8.8
Current marital status		
Unmarried	14	3.7
Married	311	82.9
Divorced/separated	10	2.9
Widowed	40	10.7
Educational level		
Illiterate	160	42.7
Primary education	114	30.4
Secondary education	70	18.7
Tertiary +	31	8.3
Occupational category		
Employee	125	33.3
Housewife	98	26.1
Farmer	83	22.1
Merchant	48	12.8
Unemployed	14	3.7
Other	7	1.9
Household monthly income quintile		
Lowest (≤ 1000 ETB)	118	31.5
Lower (1001–1500 ETB)	49	13.1
Middle (1501–2000 ETB)	78	20.8
Higher (2001–3000 ETB)	65	17.3
Highest (> 3000 ETB)	65	17.3
Enrolment on CBHI		
Yes	214	57.1
No	161	42.9

CBHI: Community based health insurance

5.2 Clinical and related profile of participants

Hypertension was the main cardiovascular diagnosis in most of the patients (n=334;89.1% while only 41 (10.9%) had cardiac disorders. More than half (n=196;52.3%) had a cardiovascular disease duration greater than ten years. Two hundred seventy-seven (73.9%)

had some sort of concomitant comorbidity. About two-thirds of the patients (n=244;65.1) were taking at least three oral medications (Table 2).

About two-thirds (n=245;65.3%) had normal BMI whereas ninety-five (25.3%) were overweight, with calculated BMI ranging from 25 to 29.9. Majority (n=215;57.3%) had self-reported sleep disturbance whereas more than two-thirds (n=257;68.5%) claimed to work their daily routines properly. With regard to substance use, about a fifth (n=73;19.5%) stated to chew chat while only twelve (3.2%) described to smoke cigarette (Table 2).

Majority (n=279;74.4%) described to have lack of availability to prescribed medications, and two hundred and eight (55.5%) patients reported to have difficulty in terms of access to prescribed medications. Well more than half (n=158;42.1%) of the patients had received counseling related to medication adherence during their clinical visits while only thirty-nine (10.4%) patients had good level of knowledge related to their disease and medication adherence (Table 2).

Table 2. Clinical, institutional and related details of patients with cardiovascular diseases having regular follow up at Butajira General Hospital, Southern Ethiopia, 2023 (n=375)

Variable	Frequency	Percent (%)
Cardiovascular disease		
Hypertension	334	89.1
Cardiac disorders	41	10.9
Duration		
<5 years	90	24.0
5–10 years	89	23.7
>10 years	196	52.3
Comorbidity		
No	98	26.1
Yes	277	73.9
Number of medications		
One	26	6.9
Two	105	28.0
≥3	244	65.1
Body mass index		
<18.5	13	3.5
18.5–24.9	245	65.3
25–29.9	95	25.3
≥30	22	5.9
Sleep disturbance		
Yes	215	57.3
No	160	42.7
Proper working		
Yes	257	68.5
No	118	31.5
Chat chewing		
Yes	73	19.5
No	302	80.5
Cigarette smoking		
Yes	12	3.2
No	363	96.8
Medication availability		
Yes	96	25.6
No	279	74.4
Difficulty in access to medication		
Yes	208	55.5
No	167	44.5
Counselled on adherence		
Yes	158	42.1
No	217	57.9
Knowledge about adherence		
Poor	336	89.6
Good	39	10.4

Regarding social support, a little more than half (192;51.2%) had poor social support as they scored less than 8 out of the total 14 score of OSSS-3. The remaining 41.9% (n=157) and 6.9%

(n=26) were shown to have moderate and strong social support based on their OSSS-3 scores (Figure 2).

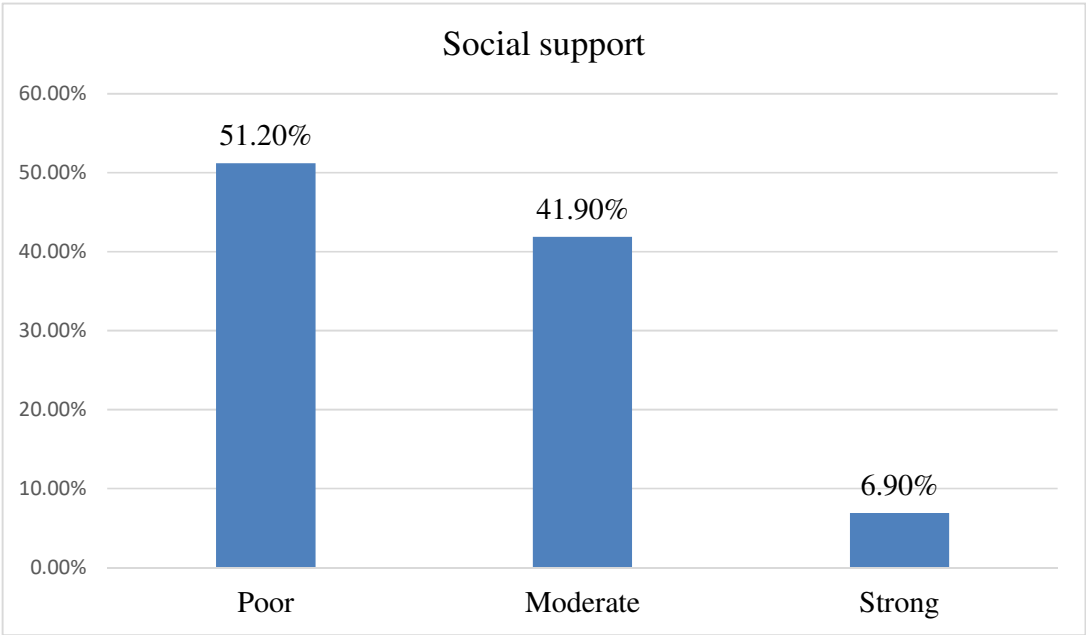


Figure 2. Social support profile (using Oslo social support scale-3) of patients with cardiovascular diseases having regular follow up at Butajira General Hospital, Southern Ethiopia, 2023 (n=375)

5.3 Medication adherence level of studied participants

Overall, about one-fourth (25.3%;95) of the respondents were found to be adherent whereas the remaining majority (74.7%;380) were non-adherent to their prescribed medications based on their scores on MMAS-8 (Figure 3).

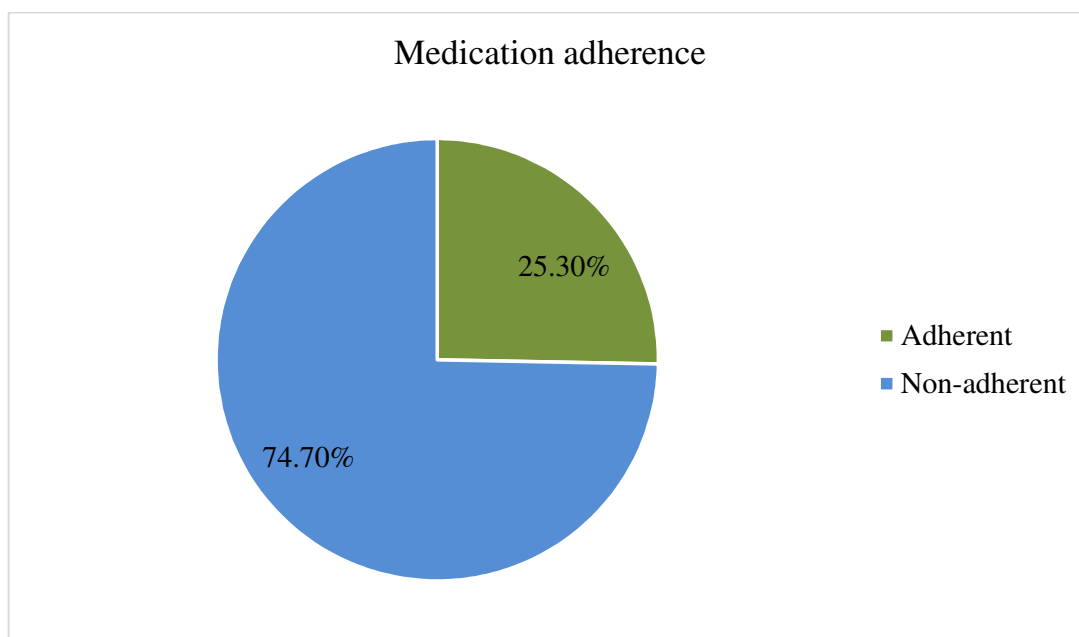


Figure 3. Medication adherence level of patients with cardiovascular diseases having regular follow up at Butajira General Hospital, Southern Ethiopia, 2023 (n=375)

5.4 Factors associated with medication adherence

Crude association of all independent variables with the dependent variable (that is, medication adherence) was checked by bivariable logistic regression. Variables with a p value of less than 0.25 in the bivariable logistic regression analysis were entered into the multivariable logistic regression model for final analysis. Accordingly, age group, enrolment on CBHI service, presence of sleep disturbance, ability of working properly, duration of the cardiovascular disorder, level of social support, availability of regularly prescribed medication(s), difficulty of access to prescribed medicines, and counselling on medication adherence were candidates for the final model. After adjusting for potential confounders in the multivariable analysis, enrolment to CBHI service, presence of sleep disturbance, availability of regularly prescribed medication(s), and counselling on medication adherence were significantly associated with medication non-adherence.

More precisely, patients who were not enrolled to CBHI service were more likely to be non-adherent than those who were health insured (AOR: 2.38, 95%CI(1.29,4.40)). Likewise, patients who had self-reported sleep disturbance had higher odds of being non-adherent compared to their counterparts with no any sleep disturbance (AOR:3.09, 95%CI (1.66,5.76)). Further, patients who declared to have lack of availability of their regular medications at the health facility were more likely than those who did not state so to be non-adherent (AOR:16.33,

95%CI (8.64,30.84)). Finally, counselling on medication adherence were significantly associated with medication adherence such that patients who were not counselled had higher odds of being non-adherent in comparison to those who received some sort of counseling during clinical visits (AOR: 2.73, 95%CI (1.53,4.87)) (Table 3).

Table 3. Factors associated with medication adherence among patients with cardiovascular diseases having regular follow up at Butajira General Hospital, Southern Ethiopia, 2023 (n=375)

Variable	Adherence		COR(95%CI)	AOR(95%CI)
	Poor (%)	Good (%)		
Age group				
<40 years	39	9	2.11(0.86,5.20)	-
40–49 years	64	14	2.23(1.02,4.09)	-
50–59 years	65	25	1.27(0.63,2.57)	-
60–69 years	71	27	1.28(0.64,2.57)	-
≥70 years	41	20	Ref.	-
Enrolment on CBHI				
Yes	148	66	Ref.	Ref.
No	132	29	2.03 (1.04,3.33)	2.38(1.29,4.40)**
Sleep disturbance				
Yes	170	45	1.72(1.08,2.74)	3.09(1.66,5.76)***
No	110	50	Ref.	Ref.
Proper working				
Yes	183	74	Ref.	-
No	97	21	1.87(1.08,3.22)	-
Duration				
<5 years	73	17	1.81(0.98,3.32)	-
5–10 years	69	20	1.45(0.81,2.60)	-
>10 years	138	58	Ref.	-
Social support				
Poor	142	50	2.84(1.23,6.54)	-
Moderate	125	32	3.91(1.65,9.24)	-
Strong	13	13	Ref.	-
Medication availability				
Yes	35	61	Ref.	Ref.
No	245	34	12.56(7.25,21.75)	16.33(8.64,30.84)***
Difficulty in access to medications				
Yes	163	45	1.55(0.97,2.47)	-
No	117	50	Ref.	-
Counselled on adherence				
Yes	99	59	Ref.	Ref.
No	181	36	3.00(1.85,4.85)	2.73(1.53,4.87)***

Only variables with p value <0.25 in binary logistic regression are illustrated

*P value < 0.05; **P value < 0.01; ***P value < 0.001; Ref.: Reference category

6. Discussion

This particular study conducted to assess medication adherence and its associated factors among patients with selected cardiovascular diseases attending Butajira General Hospital, Southern Ethiopia. Subsequently, the study discovered several important findings. The present study showed that three-fourths of the participants had poor medication adherence levels. Moreover, it was revealed that medication adherence was affected by insurance status, sleep disturbance, in-facility medication availability, and counseling by an onsite healthcare professional on medication adherence.

In particular, the study demonstrated that 74.7% of the studied patients were non-adherent to the prescribed medications. This finding is in line with Shimels et al. that obtained an overall magnitude of poor medication adherence of 72% among patients with hypertension and diabetes mellitus (53). Similarly, the magnitude of non-adherence obtained in this study is close to that of Berisa and Dedefo, who reported that 31.4% of participants were adherent to their treatment in West Ethiopia (54). Even more so, this finding is congruent with the Tanzanian report, which displayed a high level of poor adherence (74.7%) among cardiac patients (28). Moreover, the current finding is also comparable to the report of Algabbani and Algabban, which documented that 42.2% of patients with cardiovascular disease were adherent to blood pressure lowering medications (55).

On the contrary, the present finding was quite different from the observation reported in northwest Ethiopia, where majority (75.1%) of patients were found to be adherent to antihypertensive therapy (17). Similarly, it was markedly lower than the observation of Seid and colleagues, who documented that only about a quarter (23.7%) of patients with heart failure were medication non-adherent (18). Again, the current adherence rate is comparatively lower than the one obtained by Asgedom et al. in southwest Ethiopia (61.8%). Further, the overall rate of non-adherence to prescribed cardiovascular medications displayed in the current study was higher than that of Kulkarni et al. among British setting in which the corresponding figure was only 40.3% (56).

This variation in adherence rate is possibly due to the discrepancy in the studied population characteristics, medication adherence assessment tools and cut off points used, and healthcare systems including the availability of patient-friendly drug regimens (for example, fixed-dose combination pills) and delivery of psychoeducation on adherence, use of technology, and availability of clinical pharmacists. More precisely, the present study included patients with

hypertension or cardiac illnesses whereas the study done northwest Ethiopia focused only on hypertensive patients (17). Further, while this study used MMAS-8 to measure adherence, Seid et al. used the Medication Adherence Report Scale (MARS-5) to explore adherence level among cardiac patients (18). Apart from this, Kulkarni et al. assessed adherence with high performance liquid chromatography-tandem mass spectrometry (LC-MS/MS), which provides a sensitive and specific detection of antihypertensive medications or their metabolites (56).

Enrolment to CBHI service was found to be associated positively with medication adherence in that uninsured patients had higher of odds non-adherence compared to their insured counterparts. This is in agreement with Nigerian report that documented a positive association between health insurance and medication adherence (57). It also corroborates with the finding in which lack of having health insurance was associated with controlled blood pressure among hypertensive patients (23).

Consistent with a previous report (58), self-reported sleep disturbance is associated with poor hypertension medication adherence. Self-reported sleep disturbances can diminish cognitive performance, which can subsequently result in compromised adherence to prescribed medications, particularly in older population (59). Furthermore, lack of availability of regularly prescribed medication(s) in their facility was shown to contribute to poor adherence in this study. This can be justified by the fact that patients are obliged to purchase medications at a relatively costlier price from a private institution when the medications are not available in the facility. Moreover, there is no functional health insurance services currently at the private health sector, and the fact that about a third (31.5%) of the participants have an income not more than 1000 Ethiopian Birr a month in this study makes it a serious concern, leading them to poor adherence to treatment (60).

Finally, this study highlighted that counselling on medication adherence was significantly associated with medication adherence. In particular, patients who were never counseled about their medication and the disease were more likely to be non-adherent to prescribed medications than those who were ever counseled about their illness and medical therapy. This particular finding is supported by the findings of Araya et al. (58) that revealed the value of pharmaceutical counseling on treatment adherence on medication adherence in Northern Ethiopia. This can be explained by the fact that counseling can enhance patients' awareness with regard to clinical benefits of medication adherence and the consequences of nonadherence, motivating them to be adherent to their medical therapy(8).

7. Strengths and limitations

7.2 Strengths

- ✓ This study used both primary and secondary data, which is believed to improve the accuracy of the data gathered.

7.2 Limitations

- ✗ As with any cross-sectional study, it is difficult to conclude about the direction or causality of the associations observed in the present study.
- ✗ There could be recall bias since patients were asked for events already happened prior to the survey.

8. Conclusion and Recommendation

8.1 Conclusion

The present study demonstrated that three-fourths of the patients with cardiovascular diseases were non-adherent to prescribed medications. Moreover, it was revealed that medication non-adherence was contributed by lack of enrolment to CBHI, presence of sleep disturbance, lack of in-facility medication availability, and lack of counseling by an onsite healthcare professional regarding medication adherence.

8.2 Recommendation

In view of our results, certain recommendations can be forwarded.

Health care providers,

Health care providers should reinforce adherence counselling, which has been shown to contribute to better medication adherence levels in patients with cardiovascular diseases. Such patient-centered interventions along with education on coping mechanisms for sleep disturbances can maximize effectiveness and have the greatest possible therapeutic outcomes.

To concerned stakeholders,

There is an urgent need for local administrative bodies to activate efforts targeting at medication adherence, and future interventions should include institutional factors. There is a necessity of scaling up CBHI to cover more patients with cardiovascular diseases in Ethiopia. Concerned stakeholders should make commonly prescribed cardiovascular medications more accessible to people with cardiovascular diseases.

To researchers,

Multi-center, stronger studies should be considered to validate the present results.

References

1. Angaw DA, Ali R, Tadele A, Shumet S. The prevalence of cardiovascular disease in Ethiopia: a systematic review and meta-analysis of institutional and community-based studies. *BMC Cardiovasc Disord* [Internet]. 2021;21(1):1–9. Available from: <https://doi.org/10.1186/s12872-020-01828-z>
2. Ogungbe O, Byiringiro S, Adedokun-Afolayan A, Seal SM, Himmelfarb CRD, Davidson PM, et al. Medication adherence interventions for cardiovascular disease in low-and middle-income countries: A systematic review. *Patient Prefer Adherence*. 2021;15:885–97.
3. Liu J, Bu X, Wei L, Wang X, Lai L, Dong C, et al. Global burden of cardiovascular diseases attributable to hypertension in young adults from 1990 to 2019. *J Hypertens*. 2021;39(12):2488–96.
4. Baroletti S, Dell’Orfano H. Medication adherence in cardiovascular disease. *Circulation*. 2010;121(12):1455–8.
5. Thanh Pham S, Anh Nguyen T, Minh Tran N, Thi Kim Cao H, Kim Le K, Xuan Duong C, et al. Medication Adherence in Cardiovascular Diseases. *Cardiovasc Dis* [Working Title]. 2022;(March 2023).
6. World Health Organization. Adherence to long term therapies-evidence for action. 2003;
7. Tantikosoom P, Aunguroch Y, Jitpanya C. Factors Predicting Medication Adherence among Cardiovascular Patients in a Primary Care Setting. 2011;(December):278–87.
8. Choudhry NK, Kronish IM, Vongpatanasin W, Ferdinand KC, Pavlik VN, Egan BM, et al. Medication Adherence and Blood Pressure. 2022;(June 2020):1–14.
9. Leslie KH, McCowan C, Pell JP. Adherence to cardiovascular medication: A review of systematic reviews. *J Public Heal (United Kingdom)*. 2019;41(1):E84–94.
10. Vrijens B, Antoniou S, Burnier M, de la Sierra A, Volpe M. Current situation of medication adherence in hypertension. *Front Pharmacol*. 2017;8(MAR):1–8.
11. Abegaz TM, Shehab A, Gebreyohannes EA, Bhagavathula AS, Elnour AA. Nonadherence to antihypertensive drugs. *Medicine (Baltimore)*. 2017;96(4):e5641.

12. Brown MT, Bussell JK. Medication Adherence: WHO Cares? 2011;
13. Padilha JC, Santos VB, Lopes CT, Lopes J de L. Prevalence of pharmacological adherence in patients with coronary artery disease and associated factors. *Rev Lat Am Enfermagem*. 2021;29.
14. Dego TR, Bobasa EM. Adherence to anti-hypertensive medication and contributing factors among non-comorbid hypertensive patients in two hospitals of Jimma town, south west Ethiopia. 2016;60–6.
15. Hussein A, Awad MS, Mahmoud HEM. Patient adherence to antihypertensive medications in upper Egypt: a cross-sectional study. *Egypt Hear J*. 2020;72(1).
16. Ali M, Alemu T, Sada O. Medication adherence and its associated factors among diabetic patients at zewditu memorial hospital, addis ababa, ethiopia. *BMC Res Notes* [Internet]. 2017;10(1):1–5. Available from: <https://doi.org/10.1186/s13104-017-3025-7>
17. Teshome DF, Bekele KB, Habitu YA, Gelagay AA. Medication adherence and its associated factors among hypertensive patients attending the Debre Tabor General Hospital, Northwest Ethiopia. *Integr Blood Press Control*. 2017;10:1–7.
18. Seid MA, Toleha HN, Sema FD. Medication Nonadherence and Associated Factors among Heart Failure Patients at University of Gondar Comprehensive Specialized Hospital, Northwest Ethiopia. *Int J Chronic Dis*. 2023;2023:1–8.
19. Mamaghani EA, Hasanpoor E, Maghsoodi E, Soleimani F. Barriers to Medication Adherence among Hypertensive Patients in Deprived Rural Areas. *Ethiop J Health Sci*. 2020;30(1):85–94.
20. Mohammed Ndagi U. Medication adherence and its associated factors among hypertensive patients in a tertiary health facility in Minna, North Central Nigeria. *Arch Clin Hypertens*. 2019;5:003–7.
21. Getenet A, Tesfa M, Ferede A, Molla Y. Determinants of adherence to anti-hypertensive medications among adult hypertensive patients on follow-up in Hawassa Referral Hospital: A case–control study. *JRSM Cardiovasc Dis*. 2019;8:204800401989275.
22. Abd Alraheem Osman F, Hassan Mohamed H, Ahmed Alhaj N. Non-adherence to

Antihypertensive Medication and Its Associated Factors Among Cardiac Patients at Alshaab Referred Clinic, November 2017. *Sudan J Med Sci.* 2019;14(2):24–37.

23. Yazie TS, Mengistu WE, Asmare Z, Belete AM, Teshome AA, Yimer YS. Medication regimen complexity and its association with adherence and blood pressure control among hypertensive patients at selected hospitals of South Gondar Zone: A hospital based cross sectional study. *PLoS One* [Internet]. 2022;17(8 August):1–15. Available from: <http://dx.doi.org/10.1371/journal.pone.0272717>
24. Roth GA, Mensah GA, Johnson CO, Addolorato G, Ammirati E, Baddour LM, et al. Global Burden of Cardiovascular Diseases and Risk Factors, 1990-2019: Update From the GBD 2019 Study. Vol. 76, *Journal of the American College of Cardiology.* 2020. p. 2982–3021.
25. Tsao CW, Aday AW, Almarzooq ZI, Alonso A, Beaton AZ, Bittencourt MS, et al. Heart Disease and Stroke Statistics-2022 Update: A Report from the American Heart Association. Vol. 145, *Circulation.* 2022. 153-639 p.
26. Macquart D, Id DT, Kane A, Kramoh KE, Ali I, Mipinda JB, et al. Factors associated with poor adherence to medication among hypertensive patients in twelve low and middle income Sub-Saharan countries. 2019;1–14.
27. Mills KT, Bundy JD, Kelly TN, Reed JE, Kearney PM, Reynolds K, et al. Global Disparities of Hypertension Prevalence and Control: A Systematic Analysis of Population-based Studies from 90 Countries. *Circulation.* 2017;134(6):441–50.
28. Pallangyo P, Millinga J, Bhalia S, Mkojera Z, Misidai N, Swai HJ, et al. Medication adherence and survival among hospitalized heart failure patients in a tertiary hospital in Tanzania: A prospective cohort study. *BMC Res Notes* [Internet]. 2020;13(1):1–8. Available from: <https://doi.org/10.1186/s13104-020-04959-w>
29. Yousuf FS, Khan MAA, Bibi R, Arif A, Arshad A, Almas A. Medication Adherence in Patients With Uncontrolled Hypertension & Hypertensive Crisis Presenting to a Hospital Setting in Karachi, Pakistan. *Cureus.* 2023;15(1):1–7.
30. Iuga AO, Mcguire MJ. Adherence and health care costs. 2014;35–44.
31. Burnier M, Egan BM. Adherence in Hypertension: A Review of Prevalence, Risk

Factors, Impact, and Management. *Circ Res*. 2019;124(7):1124–40.

32. Abdisa L, Alemu A, Heluf H, Sertsu A, Dessie Y, Negash B, et al. Factors associated with poor medication adherence during COVID-19 pandemic among hypertensive patients visiting public hospitals in Eastern Ethiopia: a cross-sectional study. *BMJ Open*. 2022;12(10):e064284.
33. Shah D, Simms K, Barksdale DJ, Wu J. Improving medication adherence of patients with chronic heart failure : challenges and solutions. 2015;87–95.
34. Yuvaraj K, Gokul S, Sivaranjini K, Manikandanesan S, Murali S, Surendran G. Prevalence of medication adherence and its associated factors among patients with noncommunicable disease in rural Puducherry, South India – A facility-based cross-sectional study. *J Fam Med Prim Care* [Internet]. 2019;8:701–5. Available from: <http://www.jfmprc.com/article.asp?issn=2249-4863;year=2017;volume=6;issue=1;spage=169;epage=170;aualast=Faizi>
35. Pedersen E, Primicerio R, Halvorsen KH, Eggen AE, Garcia BH, Schirmer H, et al. Medication adherence among persons with coronary heart disease and associations with blood pressure and low-density-lipoprotein-cholesterol. *Eur J Clin Pharmacol* [Internet]. 2022;78(5):857–67. Available from: <https://doi.org/10.1007/s00228-022-03276-4>
36. Aggarwal B, Pender A, Mosca L, Mochari-Greenberger H. Factors associated with medication adherence among heart failure patients and their caregivers. *J Nurs Educ Pract*. 2014;5(3):22–7.
37. Khatib R, Marshall K, Silcock J, Forrest C, Hall AS. Adherence to coronary artery disease secondary prevention medicines : exploring modifiable barriers. 2019;1–10.
38. Amininasab S, Lolaty H, Moosazadeh M, Shafipour V. Medication adherence and its predictors among patients with heart failure. *Nurs Midwifery Stud*. 2018;7(2):81.
39. Ale OK, Busari AA, Rokosu ES, Akinyede AA, Usman SO, Olayem SO. Medication nonadherence in Nigerian heart failure patients:A cross sectional study. *J Clin Sci*. 2021;18:155–60.
40. Awad A, Osman N, Altayib S. Medication adherence among cardiac patients in

- Khartoum State, Sudan: A cross-sectional study. *Cardiovasc J Afr*. 2017;28(6):350–5.
41. Asgedom SW, Atey TM, Desse TA. Antihypertensive medication adherence and associated factors among adult hypertensive patients at Jimma University Specialized Hospital, southwest Ethiopia. *BMC Res Notes* [Internet]. 2018;11(1):1–8. Available from: <https://doi.org/10.1186/s13104-018-3139-6>
 42. Seid E, Engidawork E, Alebachew M, Mekonnen D, Beyene A, Id B. Evaluation of drug therapy problems , medication adherence and treatment satisfaction among heart failure patients on follow-up at a tertiary care hospital in Ethiopia. 2020;1–16. Available from: <http://dx.doi.org/10.1371/journal.pone.0237781>
 43. Alalaqi A, Lawson G, Obaid Y, Id ST. Adherence to cardiovascular pharmacotherapy by patients in Iraq : A mixed methods assessment using quantitative dried blood spot analysis and the 8-item Morisky Medication Adherence Scale. 2021;1–15. Available from: <http://dx.doi.org/10.1371/journal.pone.0251115>
 44. Kumar A, May W. Patients ' Perception of Factors Influencing Noncompliance with Medication among Cardiac Patients in Fiji : A Qualitative Study. 2021;1843–52.
 45. Abate TW. Medication non-adherence and associated factors among diabetes patients in Felege Hiwot Referral Hospital, Bahir Dar city administration, Northwest Ethiopia. *BMC Res Notes* [Internet]. 2019;12(1):1–6. Available from: <https://doi.org/10.1186/s13104-019-4205-4>
 46. Berhane Y, Byass P. Physical Geography of the Butajira DSS Area. *BMC Public Health*. 2014;14(97):1471–2458.
 47. Eticha T, Teklu A, Ali D, Solomon G, Alemayehu A. Factors associated with medication adherence among patients with schizophrenia in Mekelle, Northern Ethiopia. *PLoS One*. 2015;10(3):1–11.
 48. Desta M, Yibeltal D, Memiah P, Ayenew T, Mulugeta H, Gedefaw M, et al. Antihypertensive medications adherence and associated uncontrolled blood pressure among hypertensive patients in Ethiopia: Systematic review and meta-analysis. *Int J Africa Nurs Sci* [Internet]. 2022;16(February):100404. Available from: <https://doi.org/10.1016/j.ijans.2022.100404>

49. De las Cuevas C, Peñate W. Psychometric properties of the eight-item Morisky Medication Adherence Scale (MMAS-8) in a psychiatric outpatient setting. *Int J Clin Heal Psychol*. 2015;15(2):121–9.
50. Laghousi D, Rezaie F, Alizadeh M, Jafarabadi MA. The eight-item Morisky Medication Adherence Scale: Validation of its Persian version in diabetic adults. *Casp J Intern Med*. 2021;12(1):77–83.
51. Kocalevent R, Berg L, Beutel ME, Hinz A, Zenger M, Härter M. Social support in the general population : standardization of the Oslo social support scale (OSSS-3). 2018;1–9.
52. Benjamin S, Dhew E, Bloom BS. Learning for Mastery. *Encycl Sci Learn*. 2012;(2):1854–1854.
53. Shimels T, Kassu RA, Bogale G, Bekele M, Getnet M, Getachew A, et al. Magnitude and associated factors of poor medication adherence among diabetic and hypertensive patients visiting public health facilities in Ethiopia during the COVID-19 pandemic. *PLoS One* [Internet]. 2021;16(4 April):1–13. Available from: <http://dx.doi.org/10.1371/journal.pone.0249222>
54. Berisa HD, Dedefo MG. Non-Adherence Related Factors to Antihypertensive Medications Among Hypertensive Patients on Follow up at Nedjo General Hospital in West Ethiopia. *Open Public Health J*. 2018;11(1):62–71.
55. Algabbani FM, Algabbani AM. Treatment adherence among patients with hypertension: Findings from a cross-sectional study. *Clin Hypertens*. 2020;26(1):1–9.
56. Kulkarni S, Rao R, Goodman JDH, Connolly K, O'Shaughnessy KM. Nonadherence to antihypertensive medications amongst patients with uncontrolled hypertension: A retrospective study. *Medicine (Baltimore)*. 2021;100(14):e24654.
57. Ajibola SS, Timothy FO. The Influence of National Health Insurance on Medication Adherence Among Outpatient Type 2 Diabetics in Southwest Nigeria. *J Patient Exp*. 2018;5(2):114–9.
58. Caceres BA, Suero-Tejada N, Estrada L, Bakken S. Abstract P313: Self-reported Sleep Disturbance is Associated With Poor Hypertension Self-management in Latinos.

Circulation [Internet]. 2020 Mar 3;141(Suppl_1). Available from:
https://www.ahajournals.org/doi/10.1161/circ.141.suppl_1.P313

59. Kohn JN, Troyer E, Guay-Ross RN, Wilson K, Walker A, Spoon C, et al. Self-reported sleep disturbances are associated with poorer cognitive performance in older adults with hypertension: a multi-parameter risk factor investigation. *Int Psychogeriatrics* [Internet]. 2020 Jul 24;32(7):815–25. Available from:
<http://europepmc.org/backend/ptpmcrender.fcgi?accid=PMC5604322&blobtype=pdf>
60. Lee H, Park JH, Floyd JS, Park S, Kim HC. Combined Effect of Income and Medication Adherence on Mortality in Newly Treated Hypertension: Nationwide Study of 16 Million Person-Years. *J Am Heart Assoc*. 2019;8(16).

Annex

Annex I

St. Paul's Hospital Millennium Medical College

Department of Medical-Surgical Nursing

Questionnaire that will be used to assess medication adherence and associated factors among cardiovascular patients attending Butajira General Hospital, Southern Ethiopia

Participant Information Sheet and Informed Consent Form

Hello dear respondents, my name is_____. I am here to collect data for the research purpose which is conducted to complete a thesis for master's degree in Cardiovascular Nursing at SPHMMC.

The purpose of this study is to assess medication adherence and associated factors among cardiovascular patients attending Butajira General Hospital, Southern Ethiopia from March 1st, 2022 to April 30th, 2023

You are selected to be one of the participants for this study. I would like to ask you to fill this questionnaire that takes 10 to 15 minutes of your time. No harm is imposed to you except the time you commit for interview but some of the question may look too personal but it is helpful for the study. In addition, there is no payment for participation even though the result of the study may benefit as a citizen. The participation in this study is entirely voluntary, you have the right to refuse or withdraw from the study at any time for any reason without penalty. However, your honest answers to these questions are important since it provide relevant information to design interventions that aim at improving adherence among patients with cardiovascular diseases.

The information you provide is confidential and it will be used only for study purpose and it will not be disclosed to anyone. A code number will be used to identify the participant therefore, writing your name is not needed.

If you have something that is not clear about the study please contact the principal investigator, Mrs. Zirya Habtu(Mobile phone: +251910094854, email: zahaelf@gmail.com) at any time.

Are you willing to participate in this study? 1. Yes 2. No

Signature of data collector certifying verbal informed consent_____

Thank You!!!

Annex II

Questionnaire

St. Paul's Hospital Millennium Medical College

Department of Medical Surgical Nursing

This is the questionnaire that will be used to assess medication adherence and associated factors among cardiovascular patients attending Butajira General Hospital, Southern Ethiopia from December 1st, 2022 to Feb 28th, 2023

001. Data collector: code ____/____/____ Name _____

002. Serial number _____

003. MRN: _____

Please encircle, fill or tick your responses in front of the questions presented below.

Part I: Socio demographic information

Q NO	Question item	Coding categories/alternative
101	Sex	1. Male 2. Female
102	Age in years	-----
103	Educational status	1. Illiterate 2. Primary school 3. High school 4. College diploma +
104	Job	1. Merchant 2. Civil servant 3. Private employed 4. Student 5. House wife 6. Jobless 7. Other (specify-----)
105	Marital status	1. Single 2. Married 3. Separated 4. Divorced 5. Windowed
106	Religion	1. Orthodox Christian 2. Protestant Christian 3. Catholic 4. Muslim 5. Other (specify-----)
107	Number of family members in the house	-----
108	Average household monthly income	ETB
109	Are you enrolled at the community-based health service?	1. Yes 2. No

110	Weight in KG	
111	Height in M	

Part II: Clinical and clinical related factors

Q. No	Question item	Response
201	What is the main cardiovascular diagnosis	1. Hypertension 2. Heart failure 3. Ischemic heart disease 4. _____
202	Duration of your illness in years?	
203	How many chronic illnesses are you currently diagnosed with?	1. 1 2. 2 3. 3 or more
204	What kind of chronic illness do you have?	1. Diabetes mellitus 2. Renal disease 3. Liver disease 4. HIV infection 5. Epilepsy 6. Other (specify _____)
205	How many prescribed medications do you take regularly?	
206	Is there any sleep disturbance?	1. Yes 2. No
207	Could you work your job properly?	1. Yes 2. No
208	Do you chew chat?	1. Yes 2. No
209	Do you smoke cigarette?	1. Yes 2. No

Part III: Social support assessing items

Q.no	Questionnaire	Categories/alternative
301	How many people are you so close to that you can count on them if you have great personal problem?	1. None 2. 1-2 3. 3-5 4. 5+
302	How much interest and concern do people show in what you do?	1. None 2. Little 3. Uncertain 4. Some 5. A lot
303	How easy is it to get practical help from others if you should need it?	1. Very difficult 2. Difficult 3. Possible 4. Easy 5. Very easy

Part IV: Knowledge and institutional related question items

Q.401	Do you know the name of your medication(s)	Yes	No
Q.402	Do you know any side effect of your regular medication?		
Q. 403	Cardiovascular diseases can be cured		
Q. 404	Cardiovascular diseases can cause severe complications		
Q. 405	Taking prescribed medications is not important in the management of CVDs		
Q. 406	Regularly prescribed medication are available at the hospital pharmacy		
Q. 407	Do you face any difficulty in getting prescribed medication		
Q. 407	Have you ever received counselling about adherence to medication from a health care worker?		

Part V: Medication adherence scale

Questions (adopted from Morisky medication adherence 8-scale)	Possible answers	
	Yes	No
501. Do you sometimes forget to take your medications?		
702. Over the past 2 weeks, were there any days when you did not take your medicine?		
503. Have you ever cut back or stopped taking your medication without telling your doctor because you felt worse when you took it?		
504. When you travel or leave home, do you sometimes forget to bring along your medications?		
505. Did you take your medicine yesterday?		
506. When you feel like your illness is under control, do you sometimes stop taking your medicine?		
507. Taking medication every day is a real inconvenience for some people. Do you ever feel hassled about sticking to your treatment plan?		
508. How often do you have difficulty remembering to take all your medication? (select one below) Never-----rarely-----not sure -----often -----Always -----		

Thank you

Name of data collector-----

-

sig. & date -----

Name of supervisor-----

sig. & date -----

በቅዱስ ፓውሎስ ሚሊኒየም ሜዲካል ኮሌጅ

ሜዲካል ሰርጂካል ዲፓርትመንት

በቡታጅራ አጠቃላይ ሆስፒታል በልብ እና ተያያዥ ህሙማን የመድሀኒት ቁርኝት/ክትትል/ እና ተያያዥ ጉዳዮች ሊሚያጠና የተዘጋጀ መጠይቅ።

የተሳታፊዎች መረጃ ወረቀት እና ፍቃድ መጠየቂያ ቅፅ።

ሰላም ተሳታፊዎ ስሜ -----ይባላል። በካርዲዮ ቫስኮላር የማስተርስ ዲግሪ ለማጠናቀቅ የሚያስፈልገኝን ጥናት መረጃ ለመሰብሰብ ዛሬ ተገኝቻለሁ።

የጥናቱ አላማ በደቡብ ክልል በቡታጅራ አጠቃላይ ሆስፒታል በልብ እና ተያያዥ ህሙማን የመድሀኒት ቁርኝት/ክትትል/ እና ተያያዥ ጉዳዮችን መጋቢት 1 እስከ ሚያዝያ 30 ማጥናት ነው።

እርስዎ በዚህ ተሳታፊ እንዲሆኑ ተመርጠዋል ከጊዜዎት ከ10-15 ደቂቃ ወስደው ይህን መጠይቅ ይሞሉ ዘንድ እጠይቆታለሁ። ምንም እንኳን አንዳንድ ጥያቄዎችን የግል ጉዳይን የሚጠየቁ ቢሆንም ለጥናቱ ጠቃሚ ናቸውና ምንም አይነት ክፍያ አያገኙም። ነገር ግን የጥናቱ ውጤት እንደ አንድ ዜጋ ሊጠቅሞት ይችላል። በዚህ ጥናት መሳተፍ ሙሉ በሙሉ በፍቃደኝነት ላይ የተመሰረተ ነው። በማናቸውም ሰዓት ከጥናቱ ያለ ምንም ቅታት አቋርጠው መውጣት ይችላሉ። ነገር ግን የዕርስዎ እውነተኛ ምላሽ የረጅም ጊዜ በሚያስፈልጋቸው የልብ እና የደም ስር ታካሚዎች የተሸለ መፍትሔ ለማምጣት ትክክለኛ መረጃ ለማግኘት ጠቃሚ ነው።

እርስዎ የሚሰጡት መረጃ ለዚህ ጥናት ብቻ የሚውል ሲሆን ሚስጥረኛነቱ የተጠበቀ ይሆናል። ለሶስተኛ ወገን አሳልፎ አይሰጥም የመለያ ቁጥር ስለምንጠቀም የዕርስዎ ስም አያስፈልግም።

ግልፅ ያልሆነ ምንም የጥናቱ ዋና አስፈፃሚ ማግኘት ይችላሉ። Mrs.ዝርያ ሀብቱ ሱሌይማን (ስልክ ቁጥር 0910094854 ኢሜል zahaelf@gmail.com) ያግኙ።

በጥናቱ ተሳታፊ ለመሆን ፍቃደኛ ነዎት። 1. አዎ 2. አይደለሁም

መጠይቁን የሚያስሞላው ሰው የቃል ፍቃድ መቀበል የሚያረጋግጥ ፊርማ -----

አመሰግናለሁ።

የሜዲካል ሰርጂካል ነርሲንግ ዲፓርትመንት

በቡታጅራ አጠቃላይ ሆስፒታል በልብ እና ተያያዥ ህሙማን የመድሀኒት ቁርኝት/ክትትል/ እና ተያያዥ ጉዳዮች የሚያጠና የተዘጋጀ መጠይቅ።

የተሳታፊዎች መረጃ ወረቀት እና ፍቃድ መጠየቂያ ቅፅ።

01-መረጃ ስብስብ ኮድ ____ / ____ / ____ ስም _____

02-መረጃ የተሰበሰበበት ቀን ____ / ____ / ____ ሰዓት _____

I. የታካሚው ግላዊ ሁኔታ

101- የተራ ቁጥር _____

102. የካርድ ቁጥር _____

103. ያታ 1. ወንድ ☐ 2. ሴት ☐

104. እድሜ _____

105 የትምህርት ደረጃ 1. ያልተማረ ☐ 2. መባፍና ማንበብ የሚችል ☐

3. የመጀመሪያ ደረጃ ትምህርት ☐ 4. ከፍተኛ ደረጃ ትምህርት (ኮሌጅ /ዩኒቨርሲቲ) ☐

106. የስራ ሁኔታ 1. ነጋዴ ☐ 2. የመንግስት ስራ ☐ 3. የግል ☐ ☐
4. ተማሪ ☐ 5. የቤት እመቤት ☐ 6. ስራ አጥ 7. ☐

ሌላ ይግለፁ _____

107. የትዳር ሁኔታ 1. ያላገባ ☐ 2. ያገባ ☐ 3. የተለያየ ☐

4. የተፋታ ☐ 5. የሞተባት/በት/ ☐

108. እምነት 1. ኦርቶዶክስ እምነት ተከታይ 2. ፕሮቴስታንት እምነት ተከታይ 3. የሙስሊም እምነት ተከታይ 4. ሌላ ይግለፁ _____

109. በቤት ውስጥ የሚኖሩ የቤተሰብ ብዛት

110. አማካኝ ወርሀዊ ገቢ

111. በአካባቢ ጤና አጠባበቅ አገልግሎት ሂደት ውስጥ አባል ኖት 1. አዎ ☐ 2. ☐
አይደለም

112. አማካኝ ክብደት በኪሎ ግራም _____

113. አማካኝ ቁመት በሜትር _____

ክፍል ሁለት ከህክምናው ጋር የተያያዙ /የተዛመዱ/ ሁኔታዎች

ተ.ቁ	ጥያቄ	ምላሽ
201.	ከልብ ጋር ተዛማጅ የሆነው ህክምና	1. የደም ግፊት 2. የልብ ድካም 3. የልብ ቧንቧ ህመም 4. ሌላ ይግለፅ
202	ምን ያህል አመት ሆነው	1.
203	ምን ያህል የቆዩ ህመም አለው	1. አንድ 2. ሁለት

		3. ብዙ
204	የትኛው የቆየ ህመም አይነት ነው ያለው	1. የስኳር ህመም 2. የደም ግፊት 3. የኩላሊት ህመም 4. የጉበት ህመም 5. የኤች አይ ቪ ቫይረስ 6. የሚጥል ህመም/በሽታ/ 7. ሌሎች ይግለፁ
205	በሀኪም የታዘዙ በቀን ምን ያህል መድሀኒት ነው የሚወስዱት	1. አንድ 2. ሁለት 3. ብዙ
206	የእንቅልፍ መረበሽ/ማጣት/ ችግር አለ	1. አዎ 2. አይ
207	እለታዊ ስራዎትን በአግባቡ ይሰራሉ	1. አዎ 2. አይ
208	ጫት ይቅማሉ	1. አዎ 2. አይ
209	ሲጋራ ያጤሳሉ	1. አዎ 2. አይ

ክፍል ሶስት የማህበራዊ ድጋፍ ሁኔታ

ተ.ቁ	ጥያቄ	ምላሽ
301.	አንተ ግላዊ ችግር ቢገጥምህ ምን ያክል ሰዎችን ነው ምታሳውቀው	1. ማሳውቀው የለም /ማንም የለም/ 2. 1-2 3. 3-5 4. ከ 5 በላይ ሰዎች
302	ምን ያህል ሰዎች ናቸው ያንቺ/ተ የጤና ጉዳይ የሚመለከታቸው እንዲሁም በምታደርገው ሂደት /ጉዳይ/ የሚደግፉክ	1. መንም የለም 2. ትንሽ ሰው 3. ውስን ሰው 4. ብዙ ሰው 5. በጣም ብዙ ሰው
303	ከሰዎች ተግባራዊ የሆነ እርዳታ ብትፈልግ የምታገኝበት መንገድ	1. በጣም ከባድ ነው 2. ከባድ ነው 3. አገኛለሁ 4. በቀላሉ አገኛለሁ

ክፍል አራት ታካሚው ስለ ህመሙ ያለው እውቀት እና ከጤና ተቋም ጋር ተዛማጅ የሆኑ ጥያቄዎች

ተ.ቁ	ጥያቄ	ምላሽ
401.	እለት ከእለት ለህመሙ የሚወስዱትን መድሀኒት ስሙን ያውቃሉ	1. አዎ 2. አይ
402	ለህመሙ የሚወስዱትን መድሀኒት የጎንዮሽ ጉዳቱን ያውቃሉ	1. አዎ 2. አይ
403	የልብ እና ተዛማጅ ህመሞች መዳን ይችላሉ	1. አዎ 2. አይ
404	ከልብ እና ተዛማጅ ህመሞች የጤና ችግር የተነሳ ሌላ የተወሳሰበ የጤና ችግር ያመጣሉ	1. አዎ 2. አይ
405	በሀኪም የታዘዙ ከልብ እና ተያያዥ ህመሞችን ለማከም መድሀኒት መውሰድ አስፈላጊ አይደለም	1. አዎ 2. አይ
406	በሀኪም የታዘዙ መድሀኒቶች በሆስፒታል ውስጥ ሁሌም ይገኛሉ	1. አዎ 2. አይ
407	የታዘዙሎትን መድሀኒት ለማግኘት የገጠሞት ችግር አለ	1. አዎ 2. አይ
408	ስለ መድሀኒቱ መቼ እንዴት እና ለምን እንደሚወስዱ ከጤና ባለሙያ ምክር አግኝተው ያውቃሉ	1. አዎ 2. አይ

ክፍል አምስት የመድሀኒት አወሳሰድ መረጃ

ተ.ቁ	ጥያቄ	ምላሽ
501.	መድሀኒቶችን ያለመውሰድ /የመርሳት/ ችግር ገጥሞት ያውቃል	1. አዎ 2. አይ
502	ላለፉት ሁለት ሳምንታት ውስጥ መድሀኒቶችን ሳይወስዱ የቀሩበት ቀን አለ	1. አዎ 2. አይ
503	መድሀኒቶችን ሲወስዱ ህመሞት የተባባሰ መስሎት ሀኪሞችን ሳያማክሩ መድሀኒቶችን አቋርጠው ያውቃሉ	1. አዎ 2. አይ
504	ከቤት ሲወጡ ወይም መንገድ ሲጓዙ መድሀኒቶችን ያለመያዝ/የመርሳት/ ችግር ገጥሞት ያውቃል	1. አዎ 2. አይ
505	ትላንት መድሀኒቶችን ውጠዋል	1. አዎ 2. አይ
506	ህመሞት የተሻሎት እየመሰሎት መድሀኒቶችን አቋርጠው ያውቃሉ	1. አዎ 2. አይ
507	እለት ከእለት ለሰዎች መድሀኒት መውሰድ ቀላል አይደለም ስለምትወስደው መድሀኒት መውሰድክ የማይለቅክ መከራ እንደሆነ አስበክ ታውቃለክ	1.አዎ 2.አይ

508	መድሀኒትነትን አስታውሰክ ለመውሰድ ምን ያህ ይከብድካል	1. በፍፁም አልረሳም 2. በጥቂቱ 3. እርግጠኛ አይደለሁም 4. አልፎ አልፎ 5. ሁሌም
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Assurance of Investigator

I, the undersigned student, agree to accept all responsibilities for the scientific, ethical and technical conduct of the research project and for provision of required progress reports as per terms and conditions of the Research and Publication Directorate and/or Department of Public Health of St. Paul's Hospital Millennium Medical College.

Name of the Student: _____

Signature: _____

Date: _____

Approval of Advisors

Name of Chief Advisor: _____

Signature: _____

Date: _____

Name of Co-advisor: _____

Signature: _____

Date: _____