



St Paul's Hospital Millennium Medical College

DETERMINANTS OF ADHERENCE TO LONG-TERM THERAPY FOR CHRONIC ILLNESSES AT SAINT PAUL'S MILLENIUM MEDICAL COLLEGE INTERNAL MEDICINE CHRONIC ILLNESS OUT PATIENT DEPARTMENT

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STUDENT RESEARCH PROPOSAL TO BE SUBMITTED TO THE
DEPARTMENT OF PUBLIC HEALTH, SPHMMC, IN PARTIAL
FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF
DOCTOR OF MEDICINE

September 2017

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ACKNOWLEDGMENT

First I would like to thank St. Paul's Hospital Millennium Medical College for arranging the research program. I would also like to thank the department of Public Health and instructors for their continued guidance, unlimited support and constructive criticism through each and every step. I am very grateful to my advisor Mrs. Haimanot for her continued support, invaluable advice, suggestions, and technical support throughout the preparing the paper.

SUMMARY

Background: Non-adherence to long term therapies in general practice has received increasing attention over the past few years. Its relationship to several determinant factors have been recognized. Non-adherence has serious clinical and economic consequences. The ability of patients to follow treatment plans in an optimal manner is frequently compromised by more than one barrier, usually related to different aspects of the problem. Patient characteristics independently associated with a higher odds of appointment non-adherence included not finishing high school, knowledge of disease the social and economic factors, the characteristics of the disease, disease therapies and patient-related factors.

Objectives: to identify determinants and level of adherence to long term therapy for chronic illnesses at SPHMMC chronic illness clinic for diabetes and hypertension.

Methods: Cross-sectional was used. Sample size was determined using the formula. The study population includes patients attending the chronic illness clinic for diabetes and hypertension. Data has been collected in the form an interview based on a structured interviewer provided questionnaire answered by eligible patients. There after data has been analyzed using the SPSS 20 software.

Result: a total of 243 patients form the SPHMMC chronic illness OPD participated in the study. Results showed 164 (67.5%) were non adherent to the recommended long term therapy. It was also found that age, marital status, living situation, educational status were factors affecting the level of adherence. 213 (87.7%) patients reported to have missed two or less appointments, which shows high adherence to follow up.

Conclusion and recommendation: The level of adherence to long term therapy at SPHMMC is alarmingly low (32.5%). Determinants of adherence included age, living situation, marital status and educational level. However, gender, type of chronic illness and occupation weren't found to have significant effect on level of adherence.

Based on these finding we recommend further research and studies be done on the factors affecting adherence to long-term therapy. As well as find ways to improve adherence.

LIST OF ABBREVIATION/ACRONYMS

SPHMMC- SAINT PAULS MILLENIUM MEDICAL COLLEGE

IMROPD- INTERNAL MEDICINE REGULAR OUT PATIENT DEPARTMENT

WHO- WORLD HEALTH ORGANIZATION

MMAS- MORISKY MEDICATION ADHERENCE SCALE

HTN-HYPERTENSION

DM-DIABETES MELLITUS

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INTRODUCTION

1.1. BACKGROUND

Poor adherence to treatment of chronic diseases is a worldwide problem of striking magnitude. Over the years there has been extensive research on patient adherence.

Adherence to long-term therapy as defined by the WHO is the extent to which a person's behavior – taking medication, following a diet, and/or executing lifestyle changes, corresponds with agreed recommendations from a health care provider. And *chronic diseases* are defined as “Diseases which have one or more of the following characteristics: they are permanent, leave residual disability, are caused by nonreversible pathological alteration, require special training of the patient for rehabilitation, or may be expected to require a long period of supervision, observation or care” (1).

Failure to keep scheduled clinic appointments (missed appointments, no-shows, nonattendance) is a common problem in ambulatory settings. Appointment non-adherence constitutes an obstacle to the provision of adequate patient care and may be associated with poor control of chronic illness, increased risk of hospitalization, reduced clinic efficiency, and mortality. Patient non-adherence can be an appreciable economic burden as well. (2)

Quality and effectiveness of healthcare outcomes depend highly upon patients' adherence to recommended treatment regimens. In some disease conditions, more than 40% of patients sustain significant risks by misunderstanding, forgetting, or ignoring healthcare advice. (4)

The idea of compliance is associated too closely with blame, be it of providers or patients and the concept of adherence is a better way of capturing the dynamic and complex changes required over long periods to maintain optimal health in people with chronic diseases. Adherence to long-term therapy for chronic illnesses in developed countries averages 50%. In developing countries, the rates are even lower (3,4).

1.2. STATEMENT OF THE PROBLEM

It is undeniable that many patients experience difficulty in following treatment recommendations. Studies have reported missed appointment rates in the range of 2% to 30% with the majority pertaining to psychiatric settings. (2)

The consequences of poor adherence to long-term therapies are poor health outcomes and increased health care costs (4). The magnitude and impact of poor adherence in developing countries is assumed to be even higher given the paucity of health resources and inequities in access to health care. For example, in China, the Gambia and Seychelles, only 43%, 27% and 26%, respectively, of patients with hypertension adhere to their antihypertensive medication regimen (5,6). In the treatment of HIV and AIDS, adherence to antiretroviral agents varies between 37% and 83% depending on the drug under study and the demographic characteristics

of patient populations (8). In Australia, only 43% of the patients with asthma take their medication as prescribed all the time and only 28% use prescribed preventive medication (9,12).

Non-communicable diseases, mental health disorders, HIV/AIDS and tuberculosis, combined represented 54% of the burden of all illness worldwide in 2001 and will exceed 65% of the global burden of disease in 2020. Contrary to popular belief, non-communicable diseases and mental health problems are also prevalent in developing countries, representing as much as 46% of the total burden of disease for the year 2001, and predicted to rise to 56% by 2020. (1,3) Adherence to long-term therapy for chronic illnesses in developed countries averages 50%. In developing countries, the rates are even lower (2). However, there are no available publications on the exact numbers.

To ascertain the true extent of adherence, data on developing countries as well as important subgroups, such as adolescents, children and marginal populations are urgently required. A full picture of the magnitude of the problem is critical to developing effective policy support for efforts directed towards improving adherence. Therefore, this study is aimed to assess the level and determinants of adherence to long term therapy at Saint Paul's Millennium Medical college.

1.3. RATIONALE /JUSTIFICATION OF THE STUDY

Poor adherence to long-term therapies severely compromises the effectiveness of treatment making this a critical issue in population health both from the perspective of quality of life and of health economics. This research will help in establishing a baseline of the level adherence of patients to long term therapies for chronic illnesses (which in this case will be referring to hypertension and diabetes), thereby possibly providing a baseline for improvement. This research is also intended to find and understand the relation between possible determinant factors and the effect on adherence of patients to long term therapies. It would also serve as a stepping stone for future researches done on this topic.

LITERATURE REVIEW

While no single intervention strategy can improve the adherence of all patients, decades of research studies agree that successful attempts to improve patient adherence depend upon a set of key factors. These include realistic assessment of patients' knowledge and understanding of the regimen, clear and effective communication between health professionals and their patients, and the nurturance of trust in the therapeutic relationship. Patients must be given the opportunity to tell the story of their unique illness experiences. (1)

Knowing the patient as a person allows the health professional to understand elements that are crucial to the patient's adherence: beliefs, attitudes, subjective norms, cultural context, social supports, and emotional health challenges, particularly depression. Physician–patient partnerships are essential when choosing amongst various therapeutic options to maximize adherence. In some disease conditions, more than 40% of patients sustain significant risks by misunderstanding, forgetting, or ignoring healthcare advice. (3,5)

The impact of poor adherence grows as the burden of chronic disease grows worldwide. Non-communicable diseases and mental disorders, human immunodeficiency virus/acquired immunodeficiency syndrome and tuberculosis, together represented 54% of the burden of all diseases worldwide in 2001 and will exceed 65% worldwide in 2020 (1,3).

The health consequences of non-adherence can be quite severe. Non-adherence compromises patient outcomes in many different ways but is most obvious when patients fail to take medications that likely would cure or at least effectively manage their illnesses (5,8). For HIV patients who are not at least 90%–95% adherent, viral replication and consequent disease progression may result (8).

Poor adherence to long-term therapies severely compromises the effectiveness of treatment making this a critical issue in population health both from the perspective of quality of life and of health economics. Interventions aimed at improving adherence would provide a significant positive return on investment through primary prevention (of risk factors) and secondary prevention of adverse health outcomes. Missed appointments have serious clinical and economic impacts. It disrupts continuity of patient care, delays treatment, and affects doctor–patient relationship and increases the cost of health care (9). Adherence is an important modifier of health system effectiveness. Health outcomes cannot be accurately assessed if they are measured predominantly by resource utilization indicators and efficacy of interventions. (10)

For patients suffering from or those at risk of coronary heart disease, non-adherence to medication treatments can jeopardize survival (10).

Further, aside from direct biomedical benefits, studies show that health may depend partly upon the act of adhering to a regimen. Some research suggests that adherence, even to a placebo, is itself beneficial to health outcomes. The clinical picture in a patient's treatment can also be confused by non-adherence with patients' risk profiles increased as a result. (13)

Adherence is simultaneously influenced by several factors. The ability of patients to follow treatment plans in an optimal manner is frequently compromised by more than one barrier, usually related to different aspects of the problem (4,5). These include: the social and economic factors, the health care system, the characteristics of the disease, disease therapies and patient-related factors. Solving the problems related to each of these factors is necessary if patients' adherence to therapies is to be improved. (14)

Factors associated with appointment non-adherence also included lack of health insurance, insurance without medication coverage, inadequate hypertension knowledge, experience of side effects, not finishing high school, high cost of discharge medications, belief that medications do not work, and medication non-adherence. Perceived self-reported barriers to appointment attendance included forgetfulness, transportation, trouble getting through at the doctor's office, and feeling that appointments are not helpful. (6,7)

Cognitive factors have been mentioned to be one of the most important factors. Patients must understand what they are supposed to do before they can follow medical recommendations. Thus, patients' health literacy is central to their ability to adhere. Health literacy involves the "degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions" (14).

Studies have shown that the risk of nonadherence is very high when patients cannot read and understand basic written medical instructions. Misunderstanding of this type is not as uncommon as one might imagine. One large study of over 2500 patients found that nearly one third had marginal or inadequate health literacy. Of these, 42% misunderstood directions for taking medications on an empty stomach, 25% misunderstood the scheduling of their next appointment, and nearly 60% were unable to read and understand a typical informed consent document (1,14). Language barriers contributed somewhat to these limitations, but even when patients could understand the language of their medical instructions, many could not comprehend the medical information. Further, older patients in this study had significantly more problems understanding their medical regimens than did younger patients.

Patients' health beliefs are affected by their health literacy, and these beliefs are also contributors to adherence and therefore non adherence as well. In a study of asthmatic patients who were given extensive, high-quality information on the use of daily inhaled corticosteroids, only 38% adhered to their medication regimen, whereas the other 62% continued to mistakenly believe that their medication should only be taken when they were symptomatic (2). In practice, patients' low "health literacy" has been linked to ineffective physician-patient communication and, in particular, physicians' failure to assess recall and comprehension of new concepts with their patients (14).

Another important factor influencing non-adherence is patients' ability to remember the details of the recommendations made to them. Studies have repeatedly shown that forgetting to take (or how to take) medications is a major contributor to non-adherence. Even when information is communicated effectively and comprehension is initially high, much of what is conveyed during the medical visit is forgotten within

moments of leaving the doctor's office. One study found that patients forgot 56% of their instructions shortly after leaving the clinic. Optimal verbal communication often does not exist, and the verbal communication between physicians and patients is often filled with technical terms and "medical jargon" that impedes patients' comprehension and retention of information (2).

Not surprisingly, when patients are presented with a very large amount of information, they tend to forget a large proportion of it. High anxiety also contributes to patients' lower levels of recall, and increases the risk of non-adherence. On the other hand, research suggests that the risk of non-adherence is reduced when patients know their doctors well and are in more familiar, and less anxiety-provoking, physician-patient relationships. Finally, it has been shown that when patients are more satisfied with their medical visits, they tend to experience better recall of information. Empathic communication involving a thorough understanding of the patient's perspective, improves adherence. Patients who are informed and affectively motivated are also more likely to adhere to their treatment recommendations. These findings illustrate the importance of the "psychosocial elements" in the medical encounter and their contribution to improving patient adherence to treatment.

OBJECTIVES OF THE STUDY

General objective:

To determine the level of adherence and determinants of long term therapy for chronic illnesses at SPHMMC chronic illness clinic for diabetes and hypertension

Specific objective

To assess the level of adherence to recommended therapy of chronic illnesses among clients attending chronic illness clinic for diabetes and hypertension at SPHMMC.

To identify determinants of adherence to recommended therapy of chronic illnesses

To determine the relationship between non adherence and various sociodemographic and other drug and patient related factors

METHODS AND MATERIALS

STUDY AREA

The study was conducted in SPHMMC in internal medicine outpatient department; the area is selected because it is the second largest central referral hospital in Ethiopia that provides service for patients referred from all over the country. The Hospital was built by Emperor Haileselassie I in 1969 G.C as a source of medical care for underserved populations. Was named St Paul General specialized Hospital till 2008 and a medical college was formed in 2007. The college has undergraduate programs in medicine, emergency nursing & ICU care and OR nursing.

The postgraduate programs were launched in 2012 with departments of Obstetrics and Gynecology and IESO (Integrated Emergency Surgery and Obstetrics). The college has already started the postgraduate program in departments of internal medicine, pediatrics and surgery.

STUDY PERIOD

The data has been collected from January 6 to March 15 2017

STUDY DESIGN

A prospective cross-sectional study was conducted on patients attending follow-up appointments for chronic illnesses at chronic illness clinic for diabetes and hypertension from January 6 to March 10 2017.

SOURCE POPULATION

The source populations are medical patients attending chronic illness clinic for diabetes and hypertension at SPHMMC

STUDY POPULATION

The study populations are selected patients with chronic illnesses who attend internal medicine regular OPD of internal medicine.

INCLUSION AND EXCLUSION CRITERIA

Inclusion criteria

- Patients attending internal medicine regular OPD with chronic illness (hypertension, diabetes)
- Age greater than 18 years
- Medical record that documented treatment at the clinic for at least 12 months.
- Those patients who attended the chronic illness clinic during the study period

Exclusion criteria

- Individuals will be excluded if they are new referrals
- Individuals not willing to participate

SAMPLE SIZE AND SAMPLING PROCEDURE

The sample is determined using a single population proportion formula by using prevalence (P) of 56.7% (Adama 2014) and assuming 95% confidence level and 5% degree of precision. The study population of 800. Then the sample size was calculated as:

$$n = \frac{Z_{\alpha/2}^2 p(1-p)}{d^2}$$

$$n=377$$

Where n=minimal sample size, d= margin of error, P=prevalence, α =degree of accuracy

$$n_f = \frac{n_o}{1 + \frac{n_o}{N}}$$

where n_o = minimal sample size
 n_f = final sample size

N= study population

nf= considering 5% non-response rate which is 13 giving total of 243

The convenient non-probable sampling technique will be used. Patients attending the chronic illness clinic for diabetes and hypertension who met inclusion criteria will be included.

VARIABLES

A. Dependent Variable

adherence to therapy

B. Independent variables

Age, Sex, Occupation, Monthly Income, Marital status, residence, level of education and type and severity of illness.

Clinical factors included medication adherence, patient physician relationship, self-perceived health status. Factors pertaining to the outpatient visit were, duration from registration to appointment, pain, perceived need for urgent care at time of visit, and average time interval between visits.

Data collection method

Data will be accessed & used after fully informing the purpose & methods of the study to the hospital personnel responsible for department of internal medicine. Provider administered questionnaires will be used. Provided by myself and colleague's.

Operational definitions

Chronic illnesses: in this case will be in reference to patients with hypertension and diabetes

Loss to follow-up or non- adherence: was defined as not having returned for appointments in <60 days or the tendency to miss greater than 3 appointments out of 10.

if at any time in the 12 months preceding the questionnaire, they had failed to reschedule a missed or patient-cancelled appointment within 1 month of the desired follow-up date

Medication non-adherence: will be scored (according to MMAS) as highly adherent if scoring 8

low/non adherence if scoring <6

DATA ANALYSIS, PROCESSING AND INTERPRETATION

The analysis was done on the basis of data and information collected directly from the patient. Statistical analysis techniques were applied to compute percentages and other quantitative data to analyze and interpret the outputs using SPSS 20 software.

DATA QUALITY CONTROL

To ascertain the quality of the data I will conduct a pilot test of the questionnaire. The interviews based on structured questionnaire will be supervised. Collected data will be analyzed for any missing, inappropriate or anomalous values.

Ethical considerations

A permission to carry out the research had been obtained from the Medical College. Informed consent will be obtained from the participants after the purpose of the study is explained. , the confidentiality& anonymity of the subjects, is strictly protected and the information will only be used for research purpose. Patients who have a poor adherence to therapy or follow-up will be linked to the responsible health professionals for counselling.

DISSEMINATION OF FINDINGS

The result of this research will be submitted to public department, and the results will be presented in the seminar. Data will be collected from patients attending the chronic illness clinic for diabetes and hypertension. The results of the research will finally be presented to the medical colleges community.

RESULTS

Sociodemographic characteristics

A total of 243 patients were interviewed; with a response rate of 100%.Of which one hundred thirty (53.5%) were females and one hundred thirteen (46.5%) where male. The mean age for the studied population was 57.42 (SD = 12.6) years with minimum age 20 and maximum 81 years. Twenty-two (9.1%) of the patients were younger than 40 years, one hundred eighteen (48.5%) were between 40 and 60 years and 100 (35.9%) were older than 60 years.

These and other sociodemographic characteristics are given in Table below.

TABLE 1 Sociodemographic Characteristics

Variable	Frequency	Percentage
----------	-----------	------------

Gender		
Male	113	46.5
Female	130	53.5
Age		
20-30	7	2.8
31-40	18	7.4
41-50	48	19.7
51-60	60	24.7
61-70	66	27.1
>70	44	18.1
Education	Frequency	Percentage
Primary	73	30.0
Preparatory	26	10.7
Higher educational levels	23	9.5
Variable	Frequency	Percentage
Marital status		
Married	133	54.7
Single	20	8.2
Widowed	67	27.6
Divorced	23	9.5
Can read and/or write	47	19.3
Illiterate (can't read or write)	44	18.1

The education profile of these patients revealed that 44 (18.1%) had no formal or education and could not read or write, while 79 (22.5%) have secondary or postsecondary education. One

hundred nineteen (49.2%) were retirees or unemployed from private and public establishments and 88 (36.4%) were private company employees.

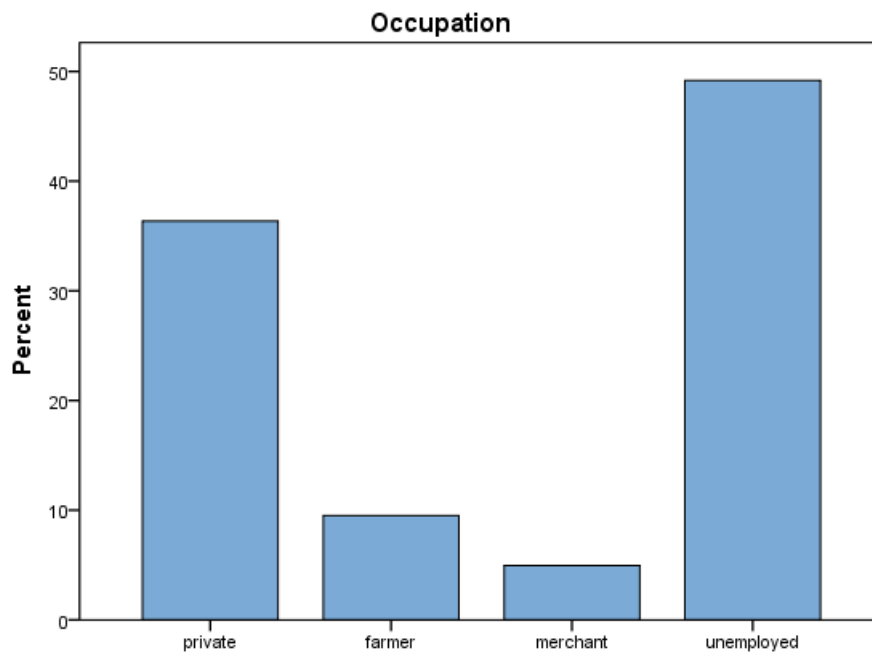


FIGURE 1Occupation

A total of 133 (54.7%) of the patients included in the study were married and living with their spouses and 67((27.6%) of the interviewee were widowed of which 61(25.1%) were living with their children.

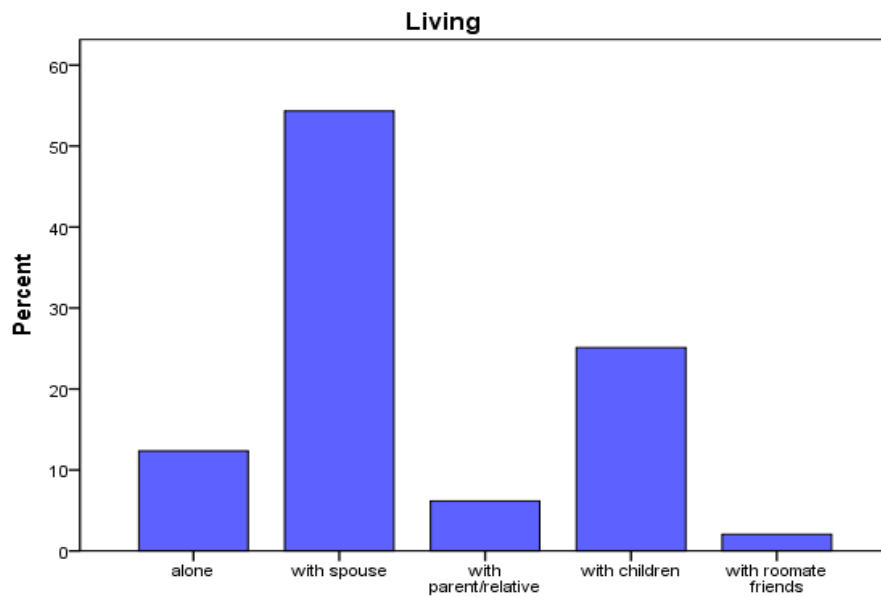


FIGURE 2. Living situation

Medication adherence

Of the 243 patients one hundred one (41.6%) had diabetes, 65 (31.7%) had hypertension and 77 (31.7%) were on follow up for both. Based on the MMAS of the 243 respondents 79 (32.5%) had high adherence to their medication, with a score of 6 or greater. On the other hand, the remaining 164 (67.5%) had low adherence, with a score of less than 6. The median MMAS score was 4.0, (range: 1.0–8.0).

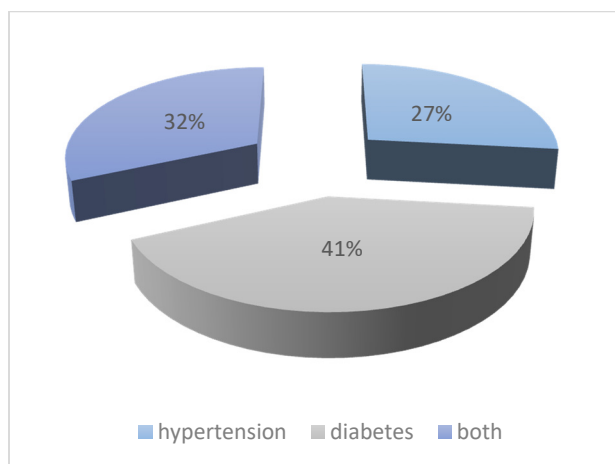


FIGURE 3: type of chronic illness

A significant difference in MMAS score was found between participant groups according to age($p=0.018$), marital status($p=0.027$), educational level($p=0.001$), and total number of chronic diseases. The level of education was found to be of a significant factor for medication adherence at the level of patients who were illiterate or without formal education, where these were more in those with low adherence. Of those aged under 40 years only 13.6% had high adherence to their medication according to the MMAS scores and of those aging between 40 and 59 34.6% had high adherence with almost comparable rates seen in those older than 60 years. However, it was found that there was no significant relationship between MMAS score and type of chronic illness ($p=0.45$).

TABLE 4. Self-reported adherence as measured by MMAS 8

MMAS question	Percentage who answered yes
Do you sometimes forget to take your medication?	45.3
Over the past two weeks were there any days you did not take your medication?	74.5
Have you ever cut back or stopped taking your medication without telling your doctor because you felt worse?	67.9
When you travel do you sometimes forget to bring along your medication?	50.2
Did you take your medication yesterday?	93.4
When you feel like your condition is under control do you sometimes stop taking your medication ?	59.3
Taking your medication every day is a real inconvenience for some people. Do you ever feel hassled sticking to your treatment plan?	65.4
How often do you have difficulty remembering to take your medication?	
Never/rarely	74
Once in awhile	16.5
Sometimes	8.6
Usually/almost always	0.8

There was no significant relationship between the gender and adherence to medication ($p=0.09$). Results showed that number of children in the family was not a significant factor for missing

appointment (P= 0.8). The distribution of other classes of education was similar in the two groups.

		MMAS			
VARIABLES			High adherence	Low adherence	p-value
Marital status	married	Count	37	96	.027
		% within marital	27.8%	72.2%	
	single	Count	3	17	
		% within profession	15%	85%	
	widowed	Count	28	39	
		% within marital	41.8%	58.2%	
	divorced	Count	11	12	
		% within marital	47.8%	52.2%	
Age	<40	Count	3	19	.018
		% within age	13.6%	86.4%	
	40-59	Count	37	70	
		% within age	34.6%	65.4%	
	>60	Count	39	75	
		% within age	33.8%	67.6%	
Gender	male	Count	38	75	.729
		% within sex	33.5%	66.4%	
	female	Count	41	89	
		% within sex	31.5%	68.1%	
Educational status	Primary	Count	25	48	.001
		% within edu	34.2%	65.8%	
	Secondary	Count	9	21	
		% within edu	30.0%	70.0%	
	Prep and higher	Count	4	45	
		% within edu	15.4%	76.7%	
	Read and write inly	Count	22	25	
		% within edu	46.8%	53.2%	
	Illiterate	Count	19	25	
		% within edu	43.2%	56.8%	

Table 2 Relationship between self-reported adherence and determinant factors

Adherence to follow up clinic

Regarding the adherence to follow up the majority (97.5%) of the patients thought that the regular follow ups were very important. One hundred fifty-six (64.2%) patients stated to have only missed 2 or less appointments within the past 6 months 30 (12.3%) said they were not likely to reschedule. When asked what they would do when an appointment was missed 169 (69.5%) said they were highly likely to reschedule the appointment and 56 (23%) would reschedule within 60 days of the missed appointment.

Of the reasons stated for missed appointments 149 (61.3%) state that they had forgotten to come, 20 (8.2%) were unable to leave work, 36 (14.8%) had household responsibilities at the time of appointment. Lack of an escort was given as the reason for missing appointments by 32(13.2%) of the respondents, while 53 (21.8%) were out of town and 34 had family problems that prevented them from attending the appointment.

One hundred thirty-three (54.7%) said the transportation was somewhat inconvenient and 65 patients thought it was very inconvenient. 179 (73.7%) travel 100km or less to make an appointment. 161(66.3%) travel less than 2 hours and of the respondents 122(50.2%) made greater or equal to 2 vehicle changes.

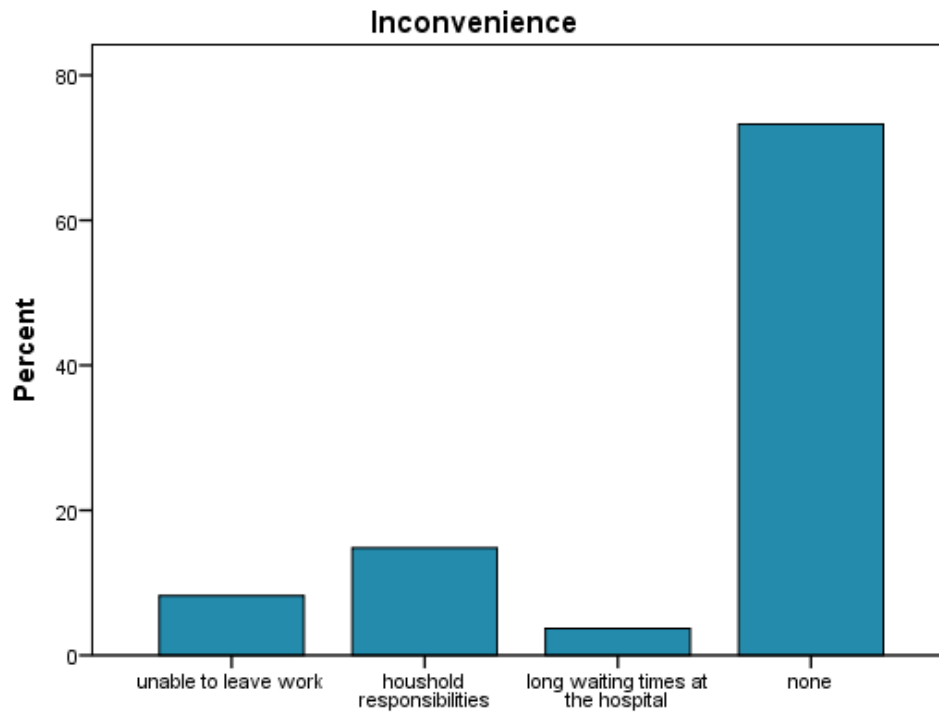


FIGURE 4. Perceived inconvenience to attending follow-up

Based on the results acquired from the questionnaire 164 (67.5%) have low adherence to medication and 79 (32.5%) have high adherence to medication.

DISCUSSION

Adherence is a primary determinant of the effectiveness of treatment because poor adherence attenuates optimum clinical benefit (1). According to the WHO the magnitude and impact of poor adherence in developing countries is assumed to be higher (compared to developed countries) given the paucity of health resources and inequities in access to health care. It was found that in Gambia and the Seychelles only 27% and 26%, respectively, of patients with hypertension adhere to their antihypertensive medication regimen. Our study has found comparable levels of the non-adherence level (67.5%).

Poor adherence to medical treatment severely compromises patient outcomes and increases patient mortality. According to the WHO, improving adherence to medical therapy for conditions of hypertension, hyperlipidemia, and diabetes would yield very substantial health and economic benefits. Most commonly cited reasons for non-adherence include treatment considered unnecessary, poor understanding of disease, forgetfulness

A study done in Canada maritime found that compared with patients younger than 55 years of age, those aged 55 to 64 and those 65 to 74 had higher reported adherence to their medication. As indicated in the results our research also showed there was an increased level of adherence in patients between the age of 40 to 60(34.6%) and those older than 61(32.4%) as compared to those younger than 40(13.6%).

Forgetfulness as a cause of medication non-adherence was reported in literatures with a prevalence of 40% and 30.4% (10,14). Forgetting to take medications was listed as a cause in 45.3% of respondents in our study as well.

A study done in India showed that 10.4% of patients thought their medication was not acting or the treatment was unnecessary and therefore discontinued without consulting their physician. Twice as many (59.3%) respondents have stated they do so as well in our study, 67.9% have also stated that they discontinued their medication because it made them feel worse. These findings suggest that the patient-physician relationship needs to be examined and that patients need better pharmaco-education about the medication they are taking.

As reported by a study done in Saudi the youngest age group (less than 20 years) showed the highest rate of missed appointments, being 25.5%. This study found that of those aged below 40 years the majority(81.6%) had missed only less than two appointments.

Sometimes patients miss doctor appointments because they have to manage other responsibilities, e.g. household responsibilities, work commitments, or because they do not have the necessary support e.g. not having a companion (7,8,9). We similarly found that difficulty receiving time off from work for the patient or their escort was associated with poor follow-up, independent of disease type (10).

Nearly all the patients in our study stated that they considered the regular follow ups to be important, similar findings have been reported in a research done on barriers to follow up adherence of patients with chronic eye disease in the US (10).

The same study done in the US showed that only 20% of patients learned about their disease from their primary care physician, however our study found that 229(94.2%) patients do recall being counseled about their illness.

STRENGTH AND LIMITATION OF THE STUDY

Strength

- Describe the level of medication adherence at SPHMMC chronic illness OPD
- Determine the level of follow up adherence
- Asses possible factors contributing to non-adherence
- Resources for next further researches.

Limitation

*There was certain level of language barrier during the interviewing of some patients which made the process take longer

CONCLUSION

Approximately two third of patients attending the SPHMMC chronic illness regular clinic reported low adherence to their medications. Family, physicians and nurse practitioners can apply strategies to improve medication adherence among these patients. Future studies will need to determine whether focusing adherence strategies on these patients will improve their overall outcomes.

RECOMMENDATION

- (i) Adequate, clear, and quality information regarding diabetes, hypertension and their respective medications should be provided to all patients in order to make the patient aware of future complications of the disease, the benefits of drug and follow up adherence.
- (ii) Patients should be encouraged to appropriately use drugs and regular awareness should be created regarding the benefits of using them there by preventing the intentional non-adherence.

- (iii) The medication non-adherence rate in this study was 67.2%. Future large-scale studies are needed for further understanding of the problem and development of more effective interventions.
- (iv) Further evaluation of the patient-physician relationship would help in understanding the cause and possible solutions for the alarming rates of non-adherence

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ANNEX

Section I Socio-demographic characteristics
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Section II. Medication adherence			
9. Do you sometimes forget to take		a. Yes	
1. Age			
2. Gender	a. Male		
	b. Female		
3. Marital status	a. Married		
	b. Single		
	c. Widowed		
	d. Divorced		
4. Living arrangement	a. Alone		
	b. With spouse		
	c. With parents/relatives		
	d. With children		
	e. With roomates/friends		
5. Ethnicity	a. Siltte		
	b. Oromo		
	c. Amhara		
	d. Other, specify		
6. Educational status	a. Primary (1-8)		
	b. Secondary(9-10)		
	c. Preparatory(11-12)		
	d. Higher educational levels (e.g. college, universities)		
	e. Can only read and write		
7. Occupation			
8. Annual family income			

your medication?	b. No	
10.Over the past two weeks were there any days you did not take your medication	a. Yes	
	b. No	
11. Have you ever cut back or stopped taking your medication without telling your doctor because you felt worse?	a. Yes	
	b. No	
12. When you travel do you sometimes forget to bring along your medication?	a. Yes	
	b. No	
13. Did you take your medication yesterday?	a. Yes	
	b. No	
14. When you feel like your condition is under control do you sometimes stop taking medication?	a. Yes	
	b.No	
15. Taking medication every day is a real inconvenience for some people. Do you ever feel hassled about sticking to your treatment plan?	a. Yes	
	b.No	
16. how often do you have difficulty remembering to take all your medication?		

Section III. Adherence to follow up		
17. How many visits have you missed within the past 12months?	a. <2 of 5	
	b. 2 out of 5	
	c. 3 or > out of 5	
18. how likely are you to reschedule a missed appointment?	a. Highly likely	
	b. Reschedule in 60 days	
	c. Not likely	
19. knowledge/ perception barriers	do you recall being counseled on your condition?	a. Yes b. No
	how important are your regular visits?	a. very important b. not too important c. somewhat important
	Have you ever forgotten to come?	a. yes b. no
20. physical barriers	a. lack of escort	
	b. age related weakness	
	c. disability	
21. time/inconvenience	a. unable to leave work	
	b. household responsibilities	
	c. long waiting times at the hospital	
22. incidental barriers	a. out of town	If others please specify
	b. family problems	
	c. others	
23. Transportation	Self-reported inconvenience of transportation	1. Not inconvenient 2. Somewhat inconvenient 3. Very inconvenient

	Travel distance from home to clinic, km	≤ 100 >100
	No. of vehicle changes required to travel from home to clinic	0 1 2 ≥ 3
	Travel time from home to clinic, h	$< 2h$ ≥ 2

Thank you for your cooperation!