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A Study on Impact of Clinical Pharmacist Interventions on Relationship between Treatment Satisfaction and Medication Adherence in Hypertensive Patients.

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Abstract:

The primary aim of this study was to assess the relation between treatment satisfaction and medication adherence in hypertensive patients. Secondary objective of the study was to provide patient counselling and developing the levels of treatment satisfaction and medication adherence. A total of 200 patients were selected in the study period of 6 months. The socio-demographical data was gathered by using specially designed data collection form. The questionnaires like Morisky Medication Adherence Scale (MMAS) and Treatment Satisfaction Questionnaire for Medication (TSQM) were adopted in study. Out of 200 patients, 185 patients answered complete questionnaires; the majority were males 56.2%, non-adherent 54.6%. According to TSQM scale findings in the study, the components mean scores for the patients (N=185) were Effectiveness 75.5, Side Effects 89.1, Convenience 79.6 and Global Satisfaction 78.3. Further, the non-adherent dissatisfied patients were selected for their improvement of Treatment Satisfaction and medication adherence by one month patient follow-up. After one month patient follow-up there was a significant improvement in their adherence and satisfaction domains. Here the significance is based on the p value <0.05. The results of this study support the hypothesis that treatment satisfaction is reliable indicators of adherence to antihypertensive medications in patients presenting with hypertension.

Keywords: Treatment Satisfaction, Medication Adherence, Hypertension, Patient counselling.

INTRODUCTION

Hypertension is a considerable community health problem in many countries. It remains significant public health challenge and one of the most essential risk factors for coronary heart disease, stroke, heart failure and end stage renal disease. High blood pressure (BP) is a major risk factor and better control can lead to prevention of 300,000 of the 1.5 million annual deaths from cardiovascular diseases in India. Poor medication adherence and lack of knowledge and awareness on hypertension are the major reasons for poor BP control which is largely related to deterioration in a patient's quality of life (Al-Ramahi R, 2014). Variables influencing adherence can be classified into patient related factors, system related factors and caregiver related factors. Multiple factors that influence patient adherence to prescribed therapies have been described and include quality of life; complexity and side effects of medications; health care system issues; demographic, behavioural, treatment, and clinical variables; and lack of knowledge regarding hypertension (Zyoud SH et al, 2013).

Satisfaction with medication can be defined as the patient's evaluation of the process of taking the medication and the outcomes associated with the medication. Satisfaction with medication is more narrowly focused and should be distinguished from other aspects of satisfaction. Treatment satisfaction involves evaluation of more than just the patient's satisfaction with the medication. It will include issues of physician– patient interaction, recommendations by the physician that go beyond the specific medication. Assessment of treatment satisfaction as broadly defined here will result in a number of factors extraneous to the patient's satisfaction with medication for a researcher (Aljumah KA et al, 2014).

Patient counselling may be defined as providing medication information orally or in written form to the patients or their representative or providing proper directions of use, advice on side effects, storage, diet and life style modifications. It involves a one-to-one interaction between a pharmacist and a patient and/or a care giver (Shahina PT et al, 2010). It is interactive in nature. The effective counselling should encompass all the parameters to make the patient/party understand his/her disease, medications and lifestyle modification required.

Treatment satisfaction is associated with adherence to treatment. Treatment satisfaction is believed to affect the patient's health- related decision making. Drug adherence is an important and complex medical issue; there has been little research that empirically demonstrates the link between medication satisfaction and adherence. This deficiency reflects the general lack of research involving patient satisfaction with medication-many of the studies that assess satisfaction along with adherence have focused on satisfaction with care, rather than satisfaction with medication (Bharmal M et al, 2009; Rejas J et al, 2010). It has become increasingly important to assess treatment satisfaction as it relates to adherence; however, it is unclear what factors influence treatment satisfaction. A review of the literature revealed very few studies on medication adherence and treatment satisfaction among patients with hypertension has been investigated. Therefore, the objectives of this study were to investigate the factors associated with adherence to antihypertensive therapy among hypertensive patients and to assess the relationship between antihypertensive medication adherence and treatment satisfaction.

MATERIALS AND METHODS

SITE OF STUDY:

The Study was conducted in a Tertiary care Hospital, Bhavani, Erode.

STUDY PERIOD:

6 months.

SAMPLE SIZE:

A sample size of not less than 200 patients was the target.

Inclusion criteria:

- Patients who has been diagnosed with hypertension.
- Patients who were 18 years and above of either sex.
- Those who were on prescribed antihypertensive medications for at least one month.
- Patients who agreed to participate were need to be explained the nature and the objectives of the study, and take the informed consent forms from the patients.

Exclusion criteria:

- Patients with more than 2 co-morbid diseases.
- Pregnant/lactating women.

DATA COLLECTION

This study received approval from J K K Nattraja Ethics Committee. Data was collected by using the questionnaire included information regarding patient demographics and clinical characteristics such as: sex, age, education, income, medical history, and co-morbidities. The other instruments used in this study were Morisky Medication Adherence Scale and Treatment Satisfaction Questionnaire for Medication scale.

Medication Adherence

Medication adherence was tested using the validated eight item Morisky Medication Adherence Scale (MMAS-8). MMAS-8 is an 8-item questionnaire with 7 yes/no questions while the last question was a 5-point Likert scale. Based on the scoring system of MMAS, adherence was rated as follows: high adherence (=8), medium adherence (6 to 8) and low adherence (<6). Patients who had a low or a moderate rate of adherence were considered as non-adherent.

Treatment Satisfaction

The Treatment Satisfaction Questionnaire for Medication (TSQM) is a widely used generic measure to assess TS-M and has been psychometrically validated in a heterogeneous sample. The TSQM Version 1.4 is comprised of 14 questions that provide scores on four scales: effectiveness (3 items), side effects (5 items), convenience (3 items) and global satisfaction (3 items).

Patient counselling based on Hypertension

Though hypertension is not a disease, it is known to be an important risk factor for several complications resulting in end organ damage. If uncontrolled it can lead to a huge adverse impact on quality of life. The management of hypertension requires non-pharmacological as well as pharmacological methods.

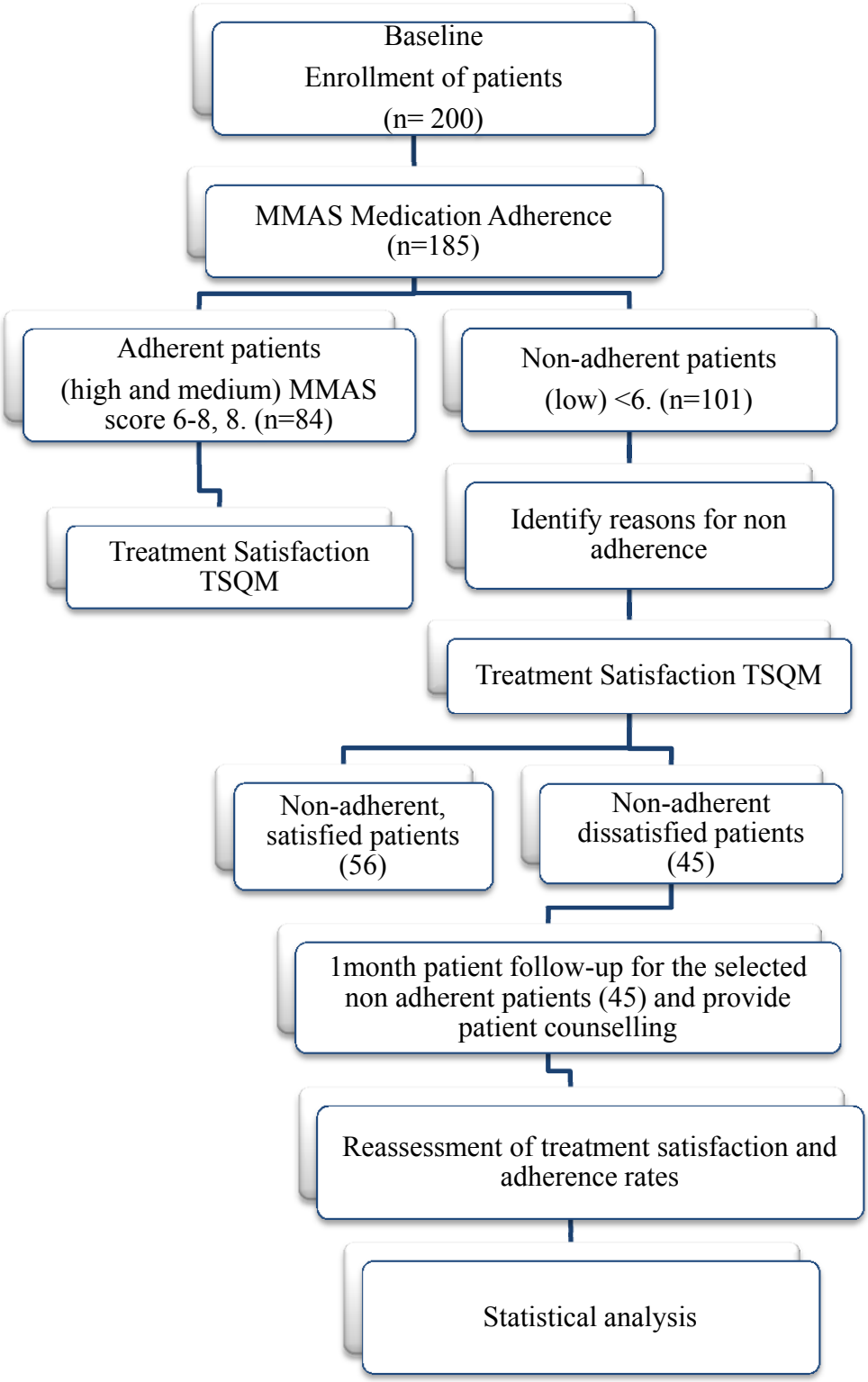
Non-pharmacological measures:

In many occasions non pharmacological treatment alone may be adequate in the management of hypertension. A pharmacist can counsel the patients regarding weight loss and regular exercise, sodium and calorie restriction, restriction of saturated fats and increased intake of dietary fibers, restriction of alcohol intake, smoking cessation, caution while using cold remedies containing sympathomimetics, self-monitoring of blood pressure etc.

Pharmacological measures:

In a majority of patients, drug therapy is required. The patients often underestimate hypertension as by itself it usually does not exhibit any major symptoms. Thus non-compliance becomes very common. Added to this is the fact that many of the antihypertensive drugs causes side effects that are very serious such as Angiotension Converting Enzyme (ACE) inhibitors induced cough, beta blockers induced bradycardia etc. In some cases the dose modulation of the drugs is also very essential.

Fig No: 1 Schematic Representation of Flow of Work with variables



RESULTS

Table No: 1 Socio-Demographics and Clinical Variables with Self-Reported Adherence.

Characteristic	Number of patients (N=185) (%)	MMAS category (score range)	
		Low (< 6) N (%)	Medium/ High (6-8) N (%)
		N=101	N=84
Age in years	17 (9.1)	13 (78.0)	4 (22.0)
18-44			
45-64	106 (57.2)	55 (51.7)	51 (48.3)
≥ 65	62 (33.7)	33 (52.0)	29 (48.0)
Gender			
Male	104 (56.2)	57 (57.6)	47 (42.4)
Female	81 (43.8)	44 (55.6)	37 (44.4)
BMI			
Normal	34 (18.4)	12 (36.4)	22 (63.6)
Overweight	89 (48.1)	46 (51.7)	43 (48.3)
Obese	62 (33.5)	43 (75.0)	19 (25.0)
Residency			
Town	89 (48.1)	44 (49.4)	45 (58.6)
Village	96 (51.9)	57 (59.3)	39 (40.7)
Education			
No formal	12 (6.5)	9 (75.0)	3 (25.0)
Primary	111 (60.0)	60 (55.6)	59 (44.4)
Secondary	49 (26.5)	28 (56.3)	21 (43.7)
Degree	13 (7.0)	4 (30.7)	9 (68.3)
Occupation			
Employed	86 (46.7)	61 (71.4)	25 (28.6)
Unemployed	43 (23.2)	22 (51.1)	21 (48.9)
Housewife	56 (30.1)	18 (38.9)	38 (61.1)
Marital status			
Single	6 (3.2)	4 (66.7)	2 (33.3)
Married	179 (96.8)	97 (54.1)	82 (45.9)
Income (Rs)			
Less than 1000	99 (55.5)	61 (62.5)	38 (37.5)
1000- 5000	68 (36.8)	34 (50.0)	34 (50.0)
≥ 5000	18 (9.7)	6 (33.3)	12 (66.7)
Lifestyle factors			
Tobacco consumption			
YES	74 (40.0)	37 (50.0)	37 (50.0)
NO	111 (60.0)	64 (61.1)	47 (38.9)
Alcoholic	62 (33.5)	43 (70.0)	19 (30.0)
Non alcoholic	123 (66.5)	58 (47.1)	65 (52.9)
Diet			
Vegetarian	25 (13.5)	19 (75.0)	6 (25.0)
Non vegetarian	160 (86.5)	82 (53.8)	78 (46.2)
Duration of disease			
< 1 years	31 (16.8)	12 (40.0)	19 (60.0)
1- 5 years	65 (35.1)	34 (52.4)	31 (47.6)
≥ 5 years	89 (48.1)	55 (65.5)	34 (35.5)
Therapy type			
Mono therapy	102 (55.1)	59 (57.6)	43 (42.4)
Multi therapy	83 (44.9)	42 (55.6)	41 (44.4)
Presence of other chronic diseases			
YES	52 (28.1)	37 (70.6)	15 (29.4)
NO	133 (71.9)	64 (48.1)	69 (51.9)
Number of medications per day			
1 medication	102 (55.1)	56 (54.5)	46 (45.5)
2 medications	49 (26.5)	21 (43.8)	28 (56.2)
≥3 medications	34 (18.4)	24 (70.6)	10 (29.4)

Table No: 2 Responses to Morisky scale questions

Number	Question	YES (%)	NO (%)
1	Do you sometimes forget to take your high blood pressure pills?	111(60.0)	74(40.0)
2	Over the past 2 weeks, were there any days when you did not take your high blood pressure medicine?	97(52.6)	31(47.4)
3	Have you ever cut back or stopped taking your medication without telling your doctor because you felt worse when you took it?	79(42.8)	106(57.2)
4	When you travel or leave home, do you sometimes forget to bring along your medications?	108(58.3)	77(41.7)
5	Did you take your high blood pressure medicine yesterday?	126(68.0)	59(32.0)
6	When you feel like your blood pressure is under control, do you sometimes stop taking your medicine?	86(46.3)	99(53.7)
7	Do you ever feel hassled about sticking to your blood pressure treatment plan?	90(48.6)	95(51.4)
8	How often do you have difficulty remembering to take all your blood pressure medication? A. Never/Rarely 49 (26.7%) B. Once in a while 56 (30.0%) C. Sometimes 65 (35.0%) D. Usually 15 (8.3%) E. All the time 0 (0.0%)		

Table No: 3 Patients' reasons for non-adherence to medications.

Factors	No of answers
Forgetfulness	108
Cost of medication	62
Lack of access to medication	63
Travelling	108
Dissatisfaction with treatment	86
Others Fear of getting used to medication	59

Table No: 4 Treatment Satisfaction TSQM Mean Scores for N=185

S.no.	Components	Mean score range (0-100)
1	EFFECTIVENESS	75.5
2	SIDE EFFECTS	89.1
3	CONVENIENCE	79.6
4	GLOBAL SATISFACTION	78.3

Table No: 5 Changes in Medication Adherence MMAS Mean Scores (N=45)

Medication Adherence	BASLINE	4 WEEKS	P value
MMAS Mean Score (N=45)	5.3	7.2	0.04

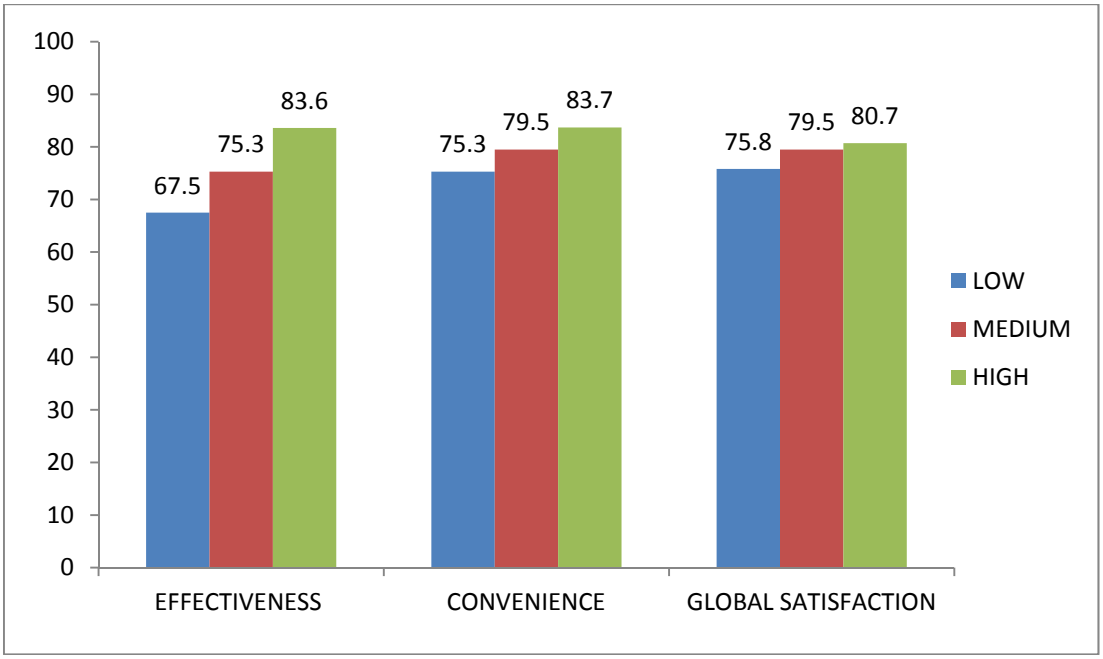
Mean difference is significant at P value<0.05

Table No: 6 Changes in Treatment Satisfaction TSQM Mean Scores (N=45)

TSQM Mean Score (N=45)	Baseline	4 Weeks	P value
Effectiveness	68.2	76.3	0.031
Side Effects	89.3	89.3	0.944
Convenience	75.9	78.6	0.022
Global Satisfaction	76.3	79.4	0.012

Mean difference is significant at P value<0.05

Fig No: 2 Treatment Satisfaction and Medication Adherence Relationship



Reassessment of Medication Adherence MMAS and Treatment Satisfaction TSQM Scores of Selected Patients (N=45) after one month patient follow-up

DISCUSSION

The aim of the study was to assess and improve the medication adherence and treatment satisfaction of hypertensive patients. A total of 200 hypertensive patients were approached in the study. The patients' details were collected using specially designed patient data collection form. Out of 200 patients, 185 patients answered complete questionnaires; the majority were males (56.2%). This study conducted by (Malhotra et al, 1999) had similar findings where it was concluded that hypertension was commonly seen in men and was associated with tobacco use, alcohol intake and sedentary lifestyle. This may be due to the high prevalence of smoking alcohol consumption, stress and physical inactivity.

In this study, hypertension reporting an age group between 45-64 years is higher (57.2%). This may be the fact that age probably represents accumulation of environmental influences and the effect of genetically programmed senescence in the body systems. Body Mass Index (BMI) was found to be significantly associated with hypertension. Similar findings were reported by (Bansal et al, 2012) that high BMI was a predictor of hypertension. In this study population smoking had positive deviation with hypertension and is reported by Joshi et al as they have predicted smoking as a strong risk factor for hypertension. This study found positive correlation between alcohol intake and hypertension. People who were having habit of alcohol consumption shown a significant association with hypertension. This may be due to the stimulation of the sympathetic nervous system, endothelin, rennin-aldosteron system, inhibition of vascular relaxing substances like nitric oxide, calcium or magnesium depletion and increase acetaldehyde. Malhotra and Bansal et al, in their study found the same.

Majority of the study population from village for (51.9%) and majority of the patient had primary level of education (60%), so there is a positive deviation between education and hypertension. Employed patients (46.7%) significantly associated with hypertension in this reported by (Al Ramahi, 2014). Stress can cause hypertension through repeated blood pressure elevations as well as stimulation of nervous system. In the study population 96.8% people were married, 55.5% of the people had low income less than 1000 per month.

In our study, majority (54.6%) of patients were non-adherent, in that males (57.6%) were found to be low adherent. Study like (Jamous et al, 2011), proved that adherence was found to be positively correlated with age and duration of illness. In this study younger age less than 45 years were found to be low adherent. It seems that the people care more when they get older. The patients who came from village (59.3%) were found low adherent. Illiteracy (75%) was most prominent among the low adherent patients. Patients who had high level of education (68.3%) were adherent. 65.5% patients were having hypertension past 5 years or more were found to be low adherent. The patients were also having low adherence due to their presence of co-morbid disease. It is due to their Living in a village compared to city was a reason for poor adherence this may be also related to lower levels of education, low income and also in addition to reaching doctor (Zyoud et al, 2013). Married patients were found adherent when compared to single.

According to MMAS-8, 101 (54.6%) patients had a low adherence and 84 (45.4%) had medium and high

adherence rates. Patients who were less than 45 years were found to be significantly non adherent rather than other age groups. The patients with more than 45 years age having better adherence rates. It seems the people care more when they get old and/or start to have disease complications. This should be considered during patient counseling; complications of hypertension in addition to risks of poor adherence to medications should be explained well to the patients in the younger age groups (Monane M et al, 1996).

According to gender wise category 57 (57.6%) of males were found to be low adherent and 47 (42.4%) of males were found to be medium or high adherent. 44 (55.6%) of females patients were found to be low adherent and 37 (44.4%) female patients were found to be high or medium adherent. It can be noticed that a low level of adherence was not influenced by sex. Patients belongs to village 57 (59.3%) were found to be predominantly non adherent and 39 (40.7%) of villagers showed medium of high adherence rates. Patients who are residing in town 45 (58.6%) seems medium or high adherent and 44 (49.4%) were low adherent. The patients' education status also influences the adherence rates. 9 (68.3%) patients among degree level were found to be medium/high adherent, whereas only 4 (30.7) were low adherent. There is a positive correlation in case of illiterate and primary level of education as they were found more in number comparatively. Patients who were earning less than Rs 1000 were found to be more non adherent in this category. Living in a village compared with a city was a reason for poor adherence also; this may be related to lower levels of education or income in addition to difficulties in reaching doctors and health-care facilities (Ramli A et al, 2012).

Presence of other chronic disease also influenced the poor adherence rates as 37 (70.6%) patients of this category were found to be low adherent. Evaluating health status as very good, good or poor compared with excellent was significantly associated with poor adherence. In some studies (Bharmal M et al, 2009; Chen H et al, 2013) lower medication adherence was associated with poor health-related quality of life. Poor health may cause the patient to be depressed and less satisfied with his medications.

28 (81.8%) of Patients who were using more than 3 medications per day were predominantly low adherent, 6 (18.2%) patients of this group were medium/high adherent. This may be due to the burden of remembering more number of drugs and their frequency.

Patient's reasons for low-adherence to medications were recorded as forgetfulness 108, cost 62, and lack of access to medication 63, traveling 108, dissatisfaction with treatment 86 and fear of getting used to medication 59. Among these reasons, forget fullness, travelling and dissatisfaction with treatment had a statistically significant association with poor adherence. Similar findings were found in the study done by Morris et al and Rowa et al.

According to TSQM scale findings in the study, the components mean scores for the patients (N=185) were Effectiveness 75.5, Side Effects 89.1, Convenience 79.6 and Global Satisfaction 78.3. There was a significant difference in the mean scores in Effectiveness, Convenience, and Global satisfaction domains, but not in the Side Effects. As most of the patients reported with no side effects, there is a increase in the side effects mean score. Similar findings were seen in the studies (Zyoud et al, 2013 and Khalaf et al, 2012) .

The Relationship between Treatment Satisfaction and Medication adherence can be explained in the Figure Number 2. The means of Satisfaction domains were correlated with different adherence levels. In low, medium and high level adherent categories, the Effectiveness mean scores are positively correlated as 67.5, 75.3 and 83.6. In low, medium and high level adherent categories, the Convenience mean scores are 75.3, 79.5 and 83.7. In the same criteria the Global Satisfaction scores are 75.8, 79.5 and 80.7. Patients in the higher adherence category had significantly higher Effectiveness, Convenience and Global satisfaction scores when compared to low adherent categories. No significant difference was found in Side Effects scores among the three adherent categoriess. In this study, as side effects were not visible in the most of the patients, the side effects domain remained unimportant.

In this study further, the non adherent dissatisfied patients were selected for their improvement of Treatment Satisfaction and medication adherence by one month patient follow-up. For this reassessment study, 45 patients were included. The patients were counselled based on their pharmacological therapy. Regular communication by phone calls and visits was useful for the improvement of patients' satisfaction and medication adherence. Disease and drug information leaflets were printed in local language for improving patients' knowledge.

The TSQM baseline mean scores for 45 patients were recorded as Effectiveness 68.2, Side Effects 89.3, Convenience 75.9 and Global Satisfaction 76.3. The mean MMAS score was 5.3. After one month patient follow-up there was a significant improvement in their satisfaction domains. Here the significance is based on the p value<0.05, which was calculated using chi square test. The TSQM mean scores after one month were Effectiveness 76.3 ($p = 0.031$), Side Effects 80.3, Convenience 78.6 ($p = 0.022$) and Global Satisfaction 79.4 ($p = 0.012$). There was a significant change in the three satisfaction domains. The MMAS mean score was recorded as 7.2. Therefore increase in the satisfaction domains scores was significantly associated with increase in medication adherence score.

Treatment satisfaction may be associated with medication adherence for several reasons, including patients' attitudes or beliefs towards taking antihypertensive medications. Morisky et al and Bharmal et al stated that the exact mechanism through which treatment satisfaction is associated with medication adherence is unknown; however, low treatment satisfaction appears to be associated with psychosocial well-being which can negatively impact a patient's ability to manage their chronic illnesses and other health problems. Previous studies performed among hypertensive patients have linked treatment satisfaction to numerous factors, which are recognised to be precursors to medication adherence. These include patients' beliefs, their perceived level of competence, knowledge and attitudes about disease treatment, and their overall attitude to life. Further research

is needed to understand the real mechanisms through which treatment satisfaction is associated with adherence to antihypertensive medications. The more information and understanding that a patient has regarding a disease and pharmacological therapies, the more they are likely to adhere to their medications (Barbosa et al, 2012).

CONCLUSION

The study showed that clinical pharmacist interventions had positive impact in improving the medication adherence and treatment satisfaction of the hypertensive patients. The one month patient follow-up had shown improvement in their adherence and also treatment satisfaction. It was quite proved that participants with low treatment satisfaction are more likely to have lower adherence to antihypertensive medications. In conclusion, the results of this study support the hypothesis that treatment satisfaction is reliable indicators of adherence to antihypertensive medications in patients presenting with hypertension. Thus, low treatment satisfaction may be an important barrier to achieving high rates of adherence to treatment. Patients should be educated about the advantages of self-management of diseases, and the common perception that drugs are inherently unsafe has to be eliminated. Further research is also recommended in order to identify appropriate and targeted interventions in an effort to improve treatment satisfaction in patients with hypertension.

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