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Original Research Article

Assessment of medication adherence among patients with chronic diseases: a descriptive cross-sectional study

Shakeel Ahmad Mir[1]*, Furqanah Muzamil[2], Mehraj UD Din Bhat[1], Abid Amin[3], Danish Shakeel[4]

[1]Department of Clinical Pharmacology, Sher-I-Kashmir Institute of Medical Sciences (SKIMS), Srinagar, Kashmir, India

[2]MBBS Student, SKIMS Medical College Bemina, Sher-I-Kashmir Institute of Medical Sciences (SKIMS), Srinagar, Kashmir, India

[3]Research Scholar, General Medicine, Sher-I-Kashmir Institute of Medical Sciences (SKIMS), Srinagar, Kashmir, India

[4]Student, CSE IBM, Chandigarh University, Mohali, Punjab, India

*Correspondence to:
Dr. Shakeel Ahmad Mir,
Email: shakeel.mir@skims.ac.in

ABSTRACT

Background: Adherence is a key factor associated with effectiveness of all pharmacological therapies. Medication non-adherence is a significant barrier to achieve positive health outcomes especially for patients suffering from chronic diseases. Improving medication adherence is a public health priority and could reduce economic and health burdens. The aim of the present study was to assess medication adherence to some common chronic ailments.

Methods: Pre-validated questionnaires were distributed among 300 patients suffering from chronic illnesses, by simple randomization out of which 240 patients returned completely filled questionnaires. The analysis was done by manual calculators, VassarStats, and SPSS V20. Results were calculated using univariate linear regression, with each patient's adherence score as the dependent variable and each predictor as the independent variable. Results are expressed in frequencies and percentages.

Results: In this study, 46.66% patients were males and 53.33% females. The mean age was 56.69 years ranging from 24 to 90 years.65.00% patients were uneducated.40.00% were taking one drug, 53.33% two to four drugs and 6.66% more than four drugs. 63.33% had low medication adherence, 35.00% medium and only 1.66% had high adherence. Compared to 14.28% men, 43.75% women were moderately adherent to medications. 41.02% uneducated patients had medium adherence as compared to 14.28% educated patients. 92.30% young patients had low adherence as compared to 53.25% in adults. 44.79% of patients receiving a single drug had medium adherence as compared to 25.00% in those receiving multiple drugs. Linear regression analysis demonstrated that the level of medication adherence was associated with patient gender, age, educational level, and number of prescribed drugs.

Conclusions: There are many challenges in understanding the reasons for non-adherence. In this study medication adherence in chronic diseases was found suboptimal and associated with patient`s socio-demographic characteristics. Patient-tailored interventions are required to achieve sufficient adherence to therapeutic drug regimens.

Keywords: Adherence, Health care, Medication, Treatment

INTRODUCTION

The WHO defines adherence to long term therapy as the extent to which a person`s behavior-taking medication, following a diet and/or executing lifestyle changes-correspond with agreed recommendations from a healthcare provider.[1] Adherence is a key factor for the effectiveness of all pharmacological therapies but is

particularly critical for medications prescribed for chronic conditions.[2] The treatment of chronic disease is often complicated by the coexistence of multiple medical conditions and by the presence of social and psychological impediments.[3] The average rates of adherence in clinical trials can be remarkably high, owing to the attention study patients receive and to selection of the patients, yet even clinical trials report average adherence rates of only 43 to 78 percent among patients receiving treatment for chronic conditions.[4]

Adherence to therapies is a primary determinant of treatment success. non-adherence is a serious problem which not only affects the patient but also the health care system.[5]

Poor adherence to the treatment of chronic diseases is a worldwide problem of striking magnitude. It has been found that approximately 50% of the patients do not adhere to one of their chronic medications. Poor adherence to long term therapies severely compromises the effectiveness of treatment making this a critical issue in the population health.[1]It can result in more rapid disease progression, adverse health outcomes and increased use of costly healthcare services.[6]

Nonadherence is found in all diseases where the self-administration of the medication is required. Despite increased awareness poor adherence to treatment for chronic diseases remains a global problem.[7]

Measurement of medication adherence is challenging because adherence is an individual patient behavior. There have been many approaches to measure medication adherence such as patient reports, pharmacy documents, tests for biomarkers, and electronic monitoring devices. The Eight-item Morisky Medication Adherence Scale (MMAS-8) is one of the simplest self reporting scales measuring medication adherence behavior.[8]

Adherence problems have generally been overlooked and have received little attention. The aim of the present study was to investigate the medication adherence pattern in some common chronic diseases.

METHODS

A descriptive cross sectional questionnaire based study was conducted in a time span of six months from March 2018 to August 2018, among patients attending various healthcare facilities in Kashmir. Sample size calculation was done to determine the population required for the study.

Sample size calculation

$n=pq/(E/1.96)^2$ where;

- n=minimum sample size

- p= prevalence of medication adherence as reported in various studies in the region.
- q=100-p
- E=margin of sample error tolerated (%)
- =5% i.e. 95% confidence interval

Study population

A Total of 300 patients selected by simple randomization were given a pre-validated questionnaire out of which only 248 returned it. Eight of them had answered incompletely hence data of only 240 participants were considered for the study and the rest were excluded.

Sampling was done by Simple random method.

Inclusion criteria

- Inhabitant of study area
- Suffering from chronic disease
- Ability to communicate by at least one of the means viz. speaking or writing
- Consuming medicine under doctor's prescription
- Age more than 18 years.

Exclusion criteria

- Inhabitant outside the study area
- Of insane mind
- Unable to communicate
- Self-medicating
- Age Less than 18 years.

Study tools

Pre-tested questionnaire which was prepared in English. It contained three sections. Section first included the questions regarding the general demographic information such as age, gender, location, educational qualification etc. Section two had questions about disease and medication. Section 3 asked questions about medication adherence, as per eight point Morisky Medication Adherence Scale (MMAS-8). After proper approval from institutional Ethics committee, the objectives of the study were explained to the study participants prior to data collection, and their consents were sought and the questionnaires were filled only by those who agreed. The confidentiality of the responders was maintained.

Data entry, analysis and interpretation

Analysis was done by combination of manual calculators, VassarStats and SPSS software packageV20.

RESULTS

A total of 300 patients recruited through simple random sampling participated in the survey. Data were collected by the use of well structured questionnaires. Results were

calculated using univariate linear regression, with each patient's adherence score as the dependent variable and each predictor as the independent variable.

Results are summarized and reported using simple descriptive statistics (No. and %ages) in Table 1 to 3.

Table 1: Characteristics of study population.

Characteristics		
Gender	**No.**	**%**
Male	112	46.66
Female	128	53.33
Marital status		
Married	232	96.66
Unmarried	08	3.33
Age group: Age (mean: 56.69)		
20-25 yrs	12	5.00
26-30 yrs	12	5.00
31-35 yrs	16	6.66
36-40 yrs	12	5.00
41-45 yrs	20	8.33
46-50 yrs	08	3.33
51-55 yrs	12	5.00
56-60 yrs	44	18.33
61-65 yrs	48	20.00
66-70 yrs	16	6.66
71-75 yrs	28	11.66
>75 yrs	12	5.00
Educational status (Literacy)		
Literate	84	35.00
Illiterate	156	65.00
Residence		
Urban	16	06.66
Rural	180	75.00
City	44	18.33

Table 1 shows patient characteristics. These include patient age, gender, residence area, marital status, and level of education. The study population consisted of 46.66% men and 53.33% women. The mean age was 56.69 years ranging from 24 to 90 years. 35.00% patients were literate and 65.00% were illiterate. 6.66% patients were from urban areas, 75.00% from rural areas and 18.33% from Srinagar city. 96.66% patients were married.

Table 2 shows that 41.66% patients were receiving medications for Hypertension, 31.66% for COPD and asthma, 16.66% for Diabetes Mellitus, and, 10.00% for rheumatoid arthritis. 8.33% had a disease of less than one-year duration, 58.33% one to five years, 25.00% six to ten years and 8.33% patients had a disease of more than ten years duration. 16.66% had been receiving medication for less a year, 50.00% for 1 year to 5 years, 25.00% for 6 years to 10 years, and 8.33% for more than 10 years. 40.00% were taking one drug, 53.33% two to four drugs and 6.66% more than four drugs. 43.33% were taking drug(s) once a day, 30.00% twice a day, 15.00% thrice a

day and 11.66% more than three times a day. 76.66% were satisfied with the treatment they received but 23.33% expressed dissatisfaction for various reasons.

Table 2: Disease and medication pattern of study population.

Characteristics	No.	%
Disease type		
Hypertension	100	41.66
COPD/Asthma	76	31.66
Diabetes Mellitus	40	16.66
Rheumatoid arthritis	24	10.00
Duration of illness		
<1yr	20	08.33
1-5 yrs	140	58.33
6-10 yrs	60	25.00
>10 yrs	20	08.33
Duration of treatment		
<1yr	40	16.66
1-5 yrs	120	50.00
6-10 yrs	60	25.00
>10 yrs	20	08.33
Number of drugs prescribed		
One drug	96	40.00
2-4 Drugs	128	53.33
>4 Drugs	16	06.66
Frequency of drug administration		
Once a day	104	43.33
Twice a day	72	30.00
Thrice a day	36	15.00
>Thrice a day	28	11.66
Treatment satisfaction		
Yes	184	76.66
No	56	23.33

Table 3 shows medication adherence levels. 63.33% had low medication adherence as per 8 points Morisky Medication Adherence Scale, 35.00% medium and only 1.66% had high adherence. Compared to 14.28% men, 43.75% women were moderately adherent to medications. 41.02% uneducated patients had medium adherence as compared to 14.28% educated patients. 92.30% young patients had low adherence and 7.69% had medium adherence. In older patients, 53.25% had low adherence, 44.68% medium and 2.12% high adherence. 44.79% patients receiving a single drug had medium adherence and 25.00% patients receiving multiple drugs had medium adherence.

DISCUSSION

Medication adherence remains a major public health concern and is expected to continue as the population ages and becomes increasingly reliant on self-administered medications. It is a critical element for chronic disease management.[9]

Medication non-adherence is a significant barrier for positive health outcomes for patients with chronic diseases.[4] There is a wide variation in reported non adherence, depending upon: definitions of adherence, the population studied, methodology used, length of observation and data analysis tools used.[10]

Table 3: Observed adherence in study population by Morisky Medication Adherence Scale (MMAS-8).

Level	No.	%
Overall adherence level		
Low	152	63.33
Medium	84	35.00
High	04	01.66
Gender-wise adherence Level		
Males (112)		
Low	96	85.71
Medium	16	14.28
High	0	0
Females (128)		
Low	68	53.12
Medium	56	43.75
High	04	03.12
Level of education and adherence Level		
Uneducated (156)		
Low	92	58.97
Medium	64	41.02
High	0	0
Educated (84)		
Low	68	80.95
Medium	12	14.28
High	04	4.76
Age-wise adherence Level		
Young adults (52)		
Low	48	92.30
Medium	04	07.69
High	0	0
Old adults (188)		
Low	100	53.25
Medium	84	44.68
High	04	02.12
Adherence level with Monotherapy vs polypharmacy		
Monotherapy (96)		
Low	53	55.20
Medium	53	44.79
High	0	
Polypharmacy (144)		
Low	104	72.22
Medium	36	25.00
High	04	2.77

Measurement of medication adherence is challenging because adherence is an individual patient behavior. Various approaches have been used to measure medication adherence. We used Eight point Morisky Medication Adherence Scale(MMAS-8) in the study. The Morisky scale is a commonly used, validated self reporting adherence measure that has been shown to be predictive of adherence to medication.[11]

This study determined the level of medication adherence in some common chronic ailments. The comparison of adherence with similar studies conducted in various countries is difficult because of differences in patient characteristics and data collection tools.

It was observed that out of 240 patients aged between 24 years to 90 years (M=56.69, SD=13.12), 63.30% had low, 35.00% medium, and only 1.66% high medication adherence.

It was also observed that female patients had better reported medication adherence (46.87% medium and high) as compared to male patients (14.28%) (p=0.81). These results are consistent with another study in which women were found more adherent.[12] but are different from other studies in which males were found more adherent.[13,14]

Authors have found that elderly people were more adherent to medication (46.80% medium and high) as compared to young patients (7.69%) (p=0.17). The results are consistent with other studies in which the prevalence of adherence was significantly lower in younger patients.[15-18]

In this study, uneducated patients were found more adherent (41.02%) than educated patients (19.04%, p=0.27) In another study uneducated patients were 75.00% adherent to medication and educated patients had lower adherence rates (71.4%). In one more study similar result were found.[19]

Patients receiving a single drug had better adherence (44.79% medium) than those receiving multiple drugs (27.77% medium and high combined) (p=0.27). Similar results were found in another study.[20] In another study it was concluded that, there appears to be an association between polypharmacy and poorer medication adherence in older adults.[10]

In this study poor correlation was found between the disease duration, frequency of drug administration and medication adherence. These findings are similar to those of Mitchell et al in another study.[19] By Pearson Correlation, age, gender, educational level and number of prescribed drugs were found directly or inversely related to the level of medication adherence.

The differences in reported medication adherence found in this study, though statistically insignificant, may be clinically important.

One limitation of this study is recall bias. We tried to minimize it by a using a well structured pre-validated questionnaire based on Morisky Medication Adherence Scale which is one of the simplest self reporting scales

measuring medication adherence behavior and the reliability and validity of which has been well established. Another limitation of this study is the limited sample size, which we tried to overcome by use of a random sampling method so as to generalize findings.

CONCLUSION

Adherence is a key factor associated with the effectiveness of all pharmacological therapies but is particularly critical for medications used in chronic diseases. The reasons for poor medication adherence are often multifactorial. The present study found a relationship between gender, age, literacy, complexity of drug regimens and medication adherence. Further studies with large sample size must be done to understand all the reasons for patient medication non-adherence.

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