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Original Research Article

Comparison of medication adherence in patients with type 2 diabetes mellitus: a pre and post study

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ABSTRACT

Background: Type 2 diabetes mellitus refers to a group of heterogeneous disorders with the common elements of chronic hyperglycemia. Diabetes medications play a crucial role in lowering blood sugar levels. The study aims to compare medication adherence in patients with type 2 diabetes mellitus from urban and rural areas during pre and post visit.

Methods: This pre and post-study was conducted from March to August 2022. A total of 104 participants were enrolled. Details have been obtained through data collection form. Medication adherence was measured using Hill-Bone medication adherence scale, and patient education was provided through leaflet.

Results: The study included 54 females and 50 males. The correlation between medication adherence versus disease knowledge and drug knowledge was found out using Pearson's correlation and the result is statistically significant. The medication adherence was found to be increased by 17.3% and 21.2% in rural and urban areas respectively. Inadequate follow-up and financial barriers were most accounted for medication non-adherence.

Conclusions: The majority of type 2 diabetes patients have suboptimal treatment adherence which is associated with poor blood sugar control. We clinical pharmacists can tackle this problem of adherence through quality patient education.

Keywords: Diabetes mellitus, Disease knowledge, Drug knowledge, Medication adherence, Patient education

INTRODUCTION

Type 2 diabetes mellitus is a metabolic condition characterized by high blood glucose resulting in micro and macrovascular complications.^{1,2} Glycemic management is needed to prevent further complications.³ Medication non-adherence leads to disease progression, functional disabilities and poor quality of life.⁴ The World Health Organization (WHO) defines medication adherence as "the extent to which the person's behavior corresponds with agreed recommendations from a healthcare provider".

The objective of the study is to compare the medication adherence in patients with type 2 diabetes mellitus from rural and urban areas. Medication adherence was estimated using the Hill-Bone medication adherence scale, a 9-item scale (Table 1) which can be self-interviewed.⁵

METHODS

Study design

This was a pre and post study.

Table 1: Hill Bones medication adherence scale.

S. no.	Questions	Reasons
1.	How often do you forget to take your anti-diabetic pill?	1. All of the time 2. Most of the time 3. Some of the time 4. None of the time
2.	How often do you decide not to take you anti-diabetic pill?	
3.	How often do you forget to get prescriptions filled?	
4.	How often do you run out of your anti-diabetic pill?	
5.	How often do you skip your anti-diabetic pill before you go to the doctor?	
6.	How often do you miss taking your anti-diabeticpill when you feel better?	
7.	How often do you miss taking your anti-diabetic pill when you feel sick?	
8.	How often do you take someone else’s anti-diabetic pill?	
9.	How often do you miss taking your anti-diabetic pill when you are careless?	
Adherence scores and results		
Poor (9-15)		Moderate (16-22)
Good (23-29)		Excellent (30-36)

Study population

The study involved 52 urban and 52 rural participants, with a total of 104 outpatient participants from the department of general medicine and the rural health centre.

Inclusion criteria

Patients of age 18-75 years with type 2 diabetes mellitus, patients on oral hypoglycaemic agents and insulin, patients visiting outpatient department were included.

Exclusion criteria

Individuals not willing to participate, patients less than 18 years old, psychiatric ill patients, patients with another type of diabetic mellitus, pregnant and lactating women were excluded.

Study period

Study was conducted between March 2022 and August 2022.

Ethical aspects

The protocol for the study was approved by the institutional human ethical committee. Data were collected only after patient’s informed and written consent.

Study tool

Data collection form was used to collect demographic details, medical and medication history from the participants. Medication and disease knowledge was assessed through questionnaires. Medication adherence was measured used Hill-Bone medication adherence scale. Patient education was provided through leaflet.

Statistical analysis

All the statistical analysis was performed using statistical package for the social sciences (SPSS) and Microsoft excel. A statistical value <0.05 was considered as significant. The results were expressed in the form of tables and graphs. All values were reported as percentage.

RESULTS

The study includes a total of 104 patients who were selected based on the inclusion and exclusion criteria after obtaining informed consent from them. Out of 104 patients included in the study all of them participated the study, there is zero dropout rates. The mean age (±SD) of participants was found to be 58.5 (±11.1) years and half of them (51.9%) were females. The major co-morbid condition was found to be hypertension (28.8%). The main barriers for medication adherence are as follows: inadequate follow up (15.4%), financial status (14.4%), health belief (3.8%), side effects (1.9%), and forget fullness (1%). A total study of 104 diabetic patients only 10.6% showed excellent adherence and 6.7% showed poor adherence most of the participants showed good adherence (54.8%), which is followed by 27.9% of moderate adherence. Adherence in urban and rural study participants during the pre and post visit in Figures 1 and 2 respectively. As shown in Tables 2 and 3 Pearson’s correlation analysis revealed drug and disease knowledge of study participants were positively correlated with medication adherence respectively at p=0.05 level.

Table 2: Drug knowledge versus medication adherence.

Parameters	Drug knowledge	Adherence
Pearson correlation	1	0.211*
Sig. (2-tailed)		0.031
N	104	104

Table 3: Disease knowledge versus medication adherence.

Parameters	Drug knowledge	Adherence
Pearson correlation	1	0.196*
Sig. (2-tailed)		0.046
N	104	104

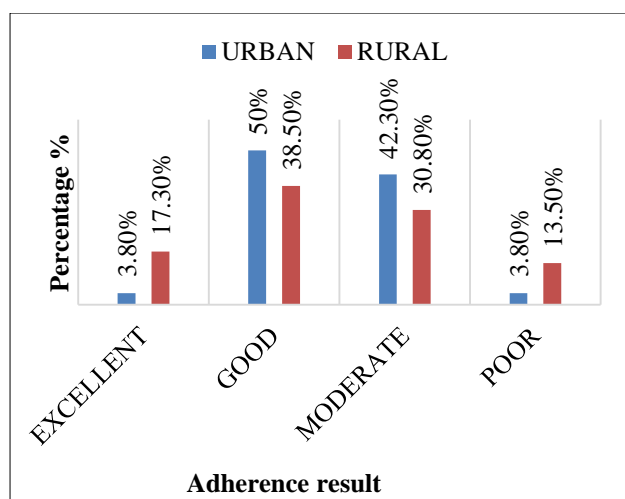


Figure 1: Medication adherence rural versus urban (pre-visit).

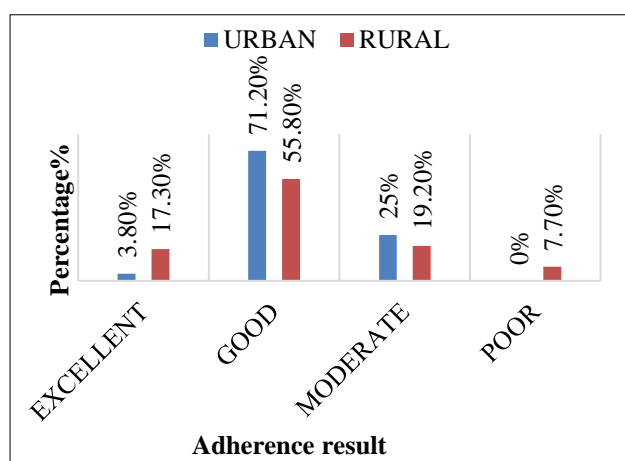


Figure 2: Medication adherence rural versus urban (post-visit).

DISCUSSION

Our study was conducted in type 2 diabetes mellitus patients; female predominated in this study, which can be due to the hormonal changes that occur within the female population after 50 years of age when they attain menopause. This can be correlated with the study done by Awodele et al.⁶ The majority of the patients belonged to the age group of 56 to 75. This is due to increased resistance to insulin and reduced glucose uptake that occurs within the old age due to loss of muscle mass, and this can be correlated with the data generated by Mordarska et al.⁷ Financial barriers accounted for 14.4%. This is due to low financial status and this can be correlated with data generated by Mackey et al.⁸ Based on our study, side effects contributes 1.9% as a barrier for low medication adherence; this data can be correlated with the study conducted by Gopalakrishna et al.⁹ Hypertension accounts for 40.4% of the total comorbidities; this data can be correlated to the study which was conducted by Basker et al.¹⁰ Based on our study, disease knowledge may

influence medication adherence; the reason being that by knowing the disease complications, such as damage to the eyes, and kidneys, due to diabetes can increase medication adherence. This can be correlated with data generated by Al-Qazaz et al.¹¹ The Hill bone medication adherence scale was used for the assessment, which showed that 6.7% had poor, 27.9% had moderate, 54.8% had good, and 10.6% had excellent medication adherence. This can be correlated with the study conducted by Tivet et al.¹² The main strength of our study is that we correlated drug and disease knowledge with the resulting adherence result of the subjects, in order to find out if an increase in drug or disease knowledge has a positive influence on the improvement of adherence to medications. The limitation of our study lies with the uneven distribution of the population most of the population is between 56-75 years of age. The reason is that with an increase in age, there is an increased chance of getting diabetes.

CONCLUSION

Generally, poor medication adherence in diabetes leads to poor blood glucose control, lower quality of life, and premature death. As a part of healthcare professionals, we clinical pharmacist can tackle the problem of adherence through quality patient education. Educational interventions such as ask-educate-ask approach, teach-back method and motivational interviewing can help patient understanding of provided education which plays a major role in improving medication adherence in patients with Type 2 Diabetes mellitus.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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