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Original Article

A Cross Sectional Study on Adherence to Medication among Patients with Hypertension and/or Diabetes Attending One of the Tertiary Care Institutes of Ahmedabad City, Gujarat, India

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Abstract

Background: The lifelong management of chronic diseases such as Hypertension and Diabetes Mellitus necessitates a comprehensive approach, including lifestyle modifications and consistent adherence to medication. Present study aimed to evaluate treatment adherence among patients with diabetes and /or hypertension attending a tertiary care institute in Ahmedabad city, India. **Methods:** A cross-sectional study was conducted among 200 patients aged over 18 years, diagnosed with diabetes and/or hypertension. The sample population was selected from a tertiary care institute at Ahmedabad city using a consecutive sampling method. Data collection utilized a pretested and predesigned proforma along with the Morisky Medication Adherence Scale (MMAS-8). **Results:** Hypertension was present in 43.0% of the participants, while 20.0% reported diabetes mellitus. Additionally, 37.0% had both conditions. Out of total 200 patients 53.5% exhibited low adherence to treatment. Lower adherence to treatment was found to be more among Diabetics (67.5%) as compared to hypertensive patients (51.2%). Among participants having comorbidities 48.6% had low adherence to treatment. The association between disease type and adherence levels was not significant (p-value = 0.305). Not having any symptoms and forgetfulness were common reasons for low adherence among 41.1% and 24.2% of participants, respectively. **Conclusion:** This study highlights the need for targeted interventions aimed at enhancing medication adherence among individuals managing with chronic illnesses like hypertension and diabetes. The findings provide valuable insights for healthcare professionals and policymakers to develop effective strategies for improving treatment adherence and subsequently mitigating the progression of these chronic conditions.

Introduction

Non-communicable diseases are on the brink of a surge in developing countries. India, already acknowledged as the "Diabetic capital of the world," is now progressing toward earning the title of the "Hypertension capital of the world" as well.[1] Lifelong treatment is mandatory in both the diseases to avert any complications. Adherence to antihypertensive as well as anti-diabetic treatment has a key role in effective management of the respective disease conditions. The World Health Organization (WHO) defined adherence as the extent to which a patient follows medical instructions.[2] In India, studies have reported rates of non-adherence to medication among the hypertensive and diabetic patients to be between 25 % and 85%.3-6 Factors affecting adherence to medication among hypertensive and diabetic patients were identified in previous studies which included type of drug regimen, duration of treatment as well as psychosocial factors.[7]

Despite the growing burden of diabetes and hypertension in India, there is a scarcity of comprehensive studies addressing adherence to treatment in the current study setting. Recognizing this research gap, the present study intended to assess medication adherence among patients with diabetes and hypertension attending one of the tertiary care hospitals in Ahmedabad city. It was also envisioned to find out the reasons behind low adherence to the treatment pertaining to diabetes and/or hypertension. This investigation is crucial for informing healthcare practices, enhancing treatment strategies, and ultimately improving the overall health outcomes of individuals grappling with these chronic conditions.

Methods

Cross-sectional study was conducted among patients attending Out patients Department of tertiary care teaching institute of Ahmedabad city of India. Study participants were patients already diagnosed with Hypertension and/or Diabetes taking treatment for more than 6 months.

Inclusion criteria: Any case of hypertension and/or diabetes more

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than 18 years of age diagnosed with diabetes and/or hypertension for more than 6 months ready to give consent for the study.

Exclusion criteria: Patients with any psychiatric illness not able to respond to questionnaire and Diabetic patients taking insulin injections were excluded from the study.

Sample size was calculated using the formula 4 p q / l^2, where p is the adherence to treatment among diabetic patients as per previous study i.e.83.6% [8]absolute precision of 5.5%, power of 80%, at 95% confidence and 10 % of non response rate, the sample size calculated to 192, which was rounded up to 200.Using consecutive sampling, patients attending medical OPD of tertiary care during study period were interviewed till the sample size of 200 was achieved.

Personal interview of the study participants was conducted using pre-tested and pre-designed proforma. Main domains of the questionnaire include Socio demographic details, Medical history related to diabetes and / or hypertension, nature of treatment, personal history etc. Socioeconomic status was assessed using modified Prasad scale.[9]Adherence to treatment was determined by Morisky medication adherence scale MMAS-8.[10] In this scale, the first seven questions had binary response categories (yes/no) while the eighth item had a five-point Likert response. The scores of the MMAS-8 range from 0 to 8. A score below 6 indicates low adherence, a score between 6 < 8 medium adherence and a score of 8 high adherence. Previous study11 suggested that MMAS-8 had better psychometric properties, with sensitivity and specificity of 93% and 53% respectively and Cronbach's alpha value of 0.83.

Data was entered in Micro Soft Excel and analysed using Jamovi Software. The categorical variables expressed in frequency and percentages and the association between the two groups was calculated using Chi-square test. The quantitative variables were expressed as mean (standard deviation). A p-value of less than 0.05 was considered as statistically significant.

Results

The majority of the study participants falls within the age group of 46-60 years, comprising 46.5% of the study population. There was a near-equal distribution of gender, with females at 48.0% and males at 52.0%. The most common education level among study group was secondary (32.5%), followed by graduate (20.5%). A significant portion of the population was unemployed (56.0%) and belonged to joint families (56.0%). Maximum numbers of participants were from upper socio-economic class constituting 47.0% of the sample ***(Table 1).***

Among total participants, Hypertension was the most prevalent condition affecting 43.0% of the sample where as Diabetes mellitus was reported by 20.0% of individuals. Total 37.0% of the respondents were having with both hypertension and diabetes mellitus. A significant portion of study participants (52.0%) were diagnosed with above condition for more than 5 years. Approximately 19.5% each fall into the categories of 1-3 years, and 3-5 years since diagnosis. The majorities (72.0%) were taking less than 3 pills per day and only 5.5% took more than 5 pills daily. Out of pocket expenditure pertaining to medication expenses was assessed. It was found that 29.0% participants were spending between 200-400 INR on medicines while 27.0% had expense of more than 600 INR. Majority (83.5%) participants were adhered to regular follow-up visits as well as lifestyle modification after diagnosis of disease ***(Table 2)***.

Table 1. Demographic Profile of Study Participants (n=200).

Variables	n	%
Age Group (Years)		
18 - 30	4	2.0
31 - 45	27	13.5
46 - 60	93	46.5
61 - 75	65	32.5
More than 75	11	5.5
Gender		
Female	96	48.0
Male	104	52.0
Education		
Primary	31	15.5
Secondary	65	32.5
Higher secondary	36	18.0
Graduate	41	20.5
Post graduate	27	13.5
Occupation		
Employed	88	44.0
Unemployed	112	56.0
Type of family		
Joint	112	56.0
Nuclear	81	40.5
Three generations	7	3.5
Socio Economic Class		
Upper	94	47.0
Upper Middle	57	28.5
Middle	24	12.0
Lower Middle	13	6.5
Lower	12	6.0

Overall around 107 (53.5%) participants were having low adherence to treatment. For diabetes mellitus, a higher percentage of individuals exhibited low adherence (67.5%), with none reported high adherence. In the case of hypertension, low adherence was seen in 51.2% cases, while 3.5% had high

adherence to treatment. Individuals with both diabetes mellitus and hypertension had a balanced distribution (48.6% each) between low and medium adherence, with a smaller percentage showing high adherence (2.7%). The Chi-square test was applied to evaluate the association between disease type and adherence levels. However, it was not statistically significant (p-value = 0.305, ***Table 3)***.

Table 2. Profile Related to Disease and its Management Among Study Group (n=200).

Variables	n	%
Type of disease		
Hypertension	86	43.0
Diabetes mellitus	40	20.0
Both	74	37.0
Duration since diagnosis of disease		
Less than 1 year	18	9.0
1-3 year	39	19.5
3-5 year	39	19.5
More than 5 year	104	52.0
Number of pills per day		
Less than 3	144	72.0
3 to 5	45	22.5
More than 5	11	5.5
Expense incurred for purchase of medicine (INR)		
<200	44	22.0
200-400	58	29.0
400-600	44	22.0
>600	54	27.0
Regular Follow up visit		
Yes	167	83.5
No	33	16.5
Life style modification after diagnosis of disease		
Yes	167	83.5
No	33	16.5
Total	**200**	**100**

On assessment of possible reasons behind low adherence, it was found that a significant portion of individuals (41.1%) were not adhered to their treatment plan because they perceived no signs or symptoms, potentially underestimating the importance of continued medication. Forgetfulness was also a common reason for low adherence among 24.2% participants ***(Table 4)***.

Discussion

Current study evaluated the adherence to treatment among patients with Diabetes, Hypertension as well as patients having both of these comorbidities. Total 200 patients were interviewed using pretested proforma including morisky medication adherence scale. The study population predominantly comprised individuals aged 46-60 years (46.5%), with a balanced gender distribution (48.0% females, 52.0% males). Secondary education was the most common (32.5%), followed by graduate (20.5%), and majority belonged to joint families (56.0%). Hypertension affected 43.0%, diabetes mellitus 20.0%, and 37.0% had both conditions. A significant portion (52.0%) had been diagnosed for over 5 years. Most participants (72.0%) consumed less than 3 pills daily, with 29.0% spending 200-400 INR on medicines. The majority (83.5%) adhered to follow-up visits and lifestyle modifications.

Table 3. Adherence to Treatment Among Patients (n=200).

Disease	Adherence to Treatment			Chi square (p value)
	Low	Medium	High	
Diabetes mellitus (n=40)	27 (67.5 %)	13 (32.5 %)	0 (0.0 %)	4.83 (0.305)
Hypertension (n=86)	44(51.2 %)	39 (45.3 %)	3 (3.5 %)	
Both (n=74)	36 (48.6%)	36 (48.6 %)	2(2.7 %)	

Table 4. Reasons Mentioned by Participant for low Adherence to Treatment (n=107).

Reasons for low adherence*	n	%
No signs and symptoms	44	41.1
Forgetfulness	26	24.2
Non availability of medicine	22	20.5
High cost of medicines	19	17.7
Side effects	12	11.2

Patients diagnosed with Diabetes Mellitus, 67.5% demonstrated low adherence to treatment, while among those diagnosed with Hypertension, 51.2% exhibited low adherence. Those having both the illnesses, 48.6% had low adherence to treatment. In the study conducted by Balasubramanian et al among hypertensive patients of rural Kerala, 41.3% had high adherence, while the remaining 58.7% had either medium or low adherence.[12] Treatment adherence for hypertension was 82% in study conducted by Rao et al.[13] One of the meta-analysis conducted by Pokharel et al reported that half of the hypertensive population of Nepal were non-adherent to their anti-hypertensive medications.[14]

In current study, 67.5% of diabetic patients reported low adherence to treatment. Similar finding were observed in the study conducted by Sahoo et al with 65.8% of diabetic patients attending tertiary care hospital of Bhubaneswar, India with poor adherence to treatment.[15] Contrary to these findings Rao et al reported in their study that 83.6% diabetic patients were

compliant to treatment.[13] In current study hypertensive patients had better adherence to treatment as compared to Diabetic patients, whereas Sweileh et al noted that diabetic patients had better overall rate of compliance than hypertensive patients in their study.[16] Difference in adherence rates observed in various studies could be due to variation in the methods utilized for assessment of adherence. Although adherence levels varied for diabetes mellitus and hypertension, the association between disease type and adherence was not statistically significant in the current study (p-value = 0.305). It's important to note that while these statistics provide insights into the relationship between disease type and adherence, a non-significant result does not imply the absence of a relationship as it may be influenced by the sample size.

Current study evaluated the reasons behind low adherence among the study participants. Lack of symptoms perception (41.1%) and forgetfulness (24.2%) were the commonest reasons mentioned by the study cohort. Similar finding was present in the study conducted by Pokharel et al who mentioned forgetfulness, carelessness and cost of medications as the primary reasons for non-adherence to treatment.[14] Rao et al identified various factors contributing to low treatment adherence, with the most prevalent reasons including the cost of medications and the asymptomatic nature of the disease.[13] Lack of symptoms in the disease can impede the patient's motivation for treatment since there are no tangible benefits experienced by the patient.

The current study concluded that overall treatment adherence was low among the study population affecting with diabetes and/or hypertension. The study highlights the need for targeted interventions to address low adherence, considering factors such as perception and forgetfulness. This research contributes to the existing literature on adherence to medication in chronic diseases, offering a basis for future interventions and public health initiatives.

Summary – Accelerating Translation

A Cross Sectional Study was conducted on Adherence to Medication among Patients with Hypertension and/or Diabetes Attending One of the Tertiary Care Institutes of Ahmedabad City of India. Total 200 patients were interviewed in the study to identify level of adherence to treatment among them. Pretested and predesigned proforma including Morisky medication Adherence scale was used for data collection. It was observed that patients having Diabetes, Hypertension as well as patients with both of these conditions were having poor adherence to treatment with percentage of low adherence 67.5, 51.2 and 48.6%, respectively. On evaluating the reasons for low adherence it was found that patients were ignoring the disease condition due to absence of any symptoms. Forgetfulness in taking medications was also mentioned by one fourth of patients. The study highlights the need for targeted intervention towards increasing adherence to medication among patients with chronic illnesses like hypertension and diabetes.

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