Medication Adherence among Diabetic Patients in a Hospital, Rupandehi, Nepal

Sachi Prajoo[1], Deepa Aryal[1], Anupama Pradhan Thaiba[1], Nira Neupane[1], Melina Gyawali[1]
[1]Crimson College of Technology, Butwal, Nepal

Correspondence: Ms. Sachi Prajoo
Lecturer, Crimson College of Technology
Butwal, Nepal
Email: sachiprajoo@gmail.com

ABSTRACT

Introduction: Diabetes mellitus is a chronic metabolic disease that is manageable by proper adherence to anti diabetic medications, resulting in glycemic control, complications prevention and a better prognosis of the patients**.** The aim of the study was to find out the medication adherence among diabetic patients in a hospital, Rupandehi.

Methods: A Hospital-based descriptive cross-sectional study was conducted to find out medication adherence among 313 diabetic patients selected through a non-probability purposive sampling method. Data was collected by using a semi-structured interview schedule and was analyzed by using descriptive statistics (frequency and percentage) and inferential statistics (chi-square) with Statistical Package for Social Sciences software (SPSS) version 20.0. The total duration of the study was from March 1, 2024 to September 1, 2024.

Results: The findings of the study showed that 38.3% of the diabetic patients were adherent to anti-diabetic medications. There is a statistically significant association between the level of medication adherence with co-morbidity conditions (p=0.024) and medication expenses (p=0.013).

Conclusions: Based on the study findings, it is concluded that less than half of the respondents were adherent to anti-diabetic medications. It is recommended that nurses and doctors working in the medicine department conduct an awareness program, including counseling sessions regarding diabetes mellitus, the importance of adherence to anti-diabetic medications and participation in the government health insurance program to reduce medication expenses.

Keywords: *Medication adherence, Diabetic Mellitus, Patient Compliance, Disease Management*

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INTRODUCTION

Diabetes mellitus (DM) is a common endocrine disease that is caused due to lack of insulin production by the pancreas or insulin resistance by body leading to microvascular and macrovascular problems including hyperglycemia. In adults, Type II diabetes mellitus is common which is also known as insulin-independent diabetes. The aim of its management is to control blood glucose and complications prevention (Hinkle et al., 2021).

According to the International Diabetes Federation in South-East Asia, about 106.9 million people were living with diabetes in 2024, which is expected to increase 185 million by 2050. Also, 1 in 7 adults are living with diabetes live in low and middle income countries and it accounts for 12 billion diabetes treatment related expenditure, while diabetes related death is 374,000 in 2024. Nepal has the fourth highest number of diabetic adults in the South East Asia region accounting 1.3 million in 2024 which is expected to increase by 2.4 million in 2050 (International Diabetes Federation [IDF], 2025).

Diabetes mellitus requires lifelong treatment with anti-diabetic medications and regular follow-up. Medication adherence improves glycemic control, which in turn prevents complications, results in a better prognosis which leads to a decrease in co-morbidity and mortality. Further, it is cost-effective as it reduces the frequency of hospitalization and costs associated with complications (Hinkle et al., 2021). So, the objective of the study was to find out the medication adherence among diabetic patients and to find out the association between levels of adherence with selected variables.

METHODS

Study design: A descriptive cross-sectional study was used in this study.

Study site and duration: The study was conducted in the medical ward and the medicine outpatient department of Universal College of Medical Science and Teaching Hospital (UCMS-TH), Siddharthnagar-1. Rupandehi, Province-5, Nepal, between March 1 to September 1, 2024.

Sample collection: Non probability purposive sampling technique was used to select the sample. All men and women aged 20 years or above, diagnosed with Type II diabetes mellitus and have been on treatment for at least a minimum of three months admitted in medical ward and who have visited medicine outpatient department for the treatment were included in the study while diabetic patients who are unable to communicate because of neurological or psychiatric illness and severely ill patients, pregnant women and with incomplete medical records were excluded from this study.

Total sample size was 313 diabetic patients which was determined by using the Cochran formula $n= Z^2p\ q/\ d^2$.

Data was collected through a semi-structured interview schedule by using the standard instrument General Medication Adherence Scale (GMAS). The research instrument was divided into two parts;

Part I related to Personal Information and

Part II GMAS questionnaire

It is a self-assessment tool consisting of 11 items comprising three sections; the first section consists of five items assessing the patient's behavior-related non-adherence; questions 1–5, and the second section includes four items assessing the additional disease and pill burden-related non-adherence (ADPB); questions 6–9. The last section consists of two items evaluating the patients' cost-related non-adherence (CRNA); questions 10–11. The responses of the 11-item GMAS are recorded on a four-point Likert scale from 0 (always) to 3 (never). The 11-item GMAS score ranges from 0 to 33. The patient's score is categorized as adherent if the total score is greater than 27 and non-adherent if the total score is less than 26 (Naqvi et al., 2020). The validated Nepali version of the tool was freely accessible and was adopted for data collection (Shrestha et al., 2021).

Ethical and administrative approval was obtained from the concerned authorities before data collection. Written informed consent was obtained from each respondent by clarifying the objectives of the study.

Data analysis: Descriptive statistics such as frequency and percentage were calculated and to find association between level of medication adherence and personal information of respondents was measured by chi-square test with 95% confidence interval.

RESULTS

Table 1. Respondents' Personal Information

N=313

Variables	Frequency	Percent
Age (in completed years)		
21-39	33	10.5
40-59	146	46.6
60 and above	134	42.8
Gender		
Male	160	51.1
Female	153	48.9
Marital status		
Married	241	77.0
Widow/widower	24	7.7
Divorced	48	15.3
Educational level (n=210)		
Informal education	104	49.5
Basic education	64	30.5
Secondary	24	11.4
Above secondary	18	8.6
Occupation		
Non-employed	160	51.1
Service	74	23.6
Self-employed	56	17.9
Labour	23	7.3
Family History		
Yes	204	65.2
No	109	34.8
Duration of DM		
1-15	289	92.3
16-30	24	7.7
Comorbidity		
Yes	245	78.3
No	68	21.7

Variables	Frequency	Percent
Medication Expenses		
Yes	239	76.4
No	74	23.6

Table 1 shows personal information of the respondents where 46.6% were from age group 40-59 years, more than half (51.1%) were male, majority (77%) were married, 67.1% were able to read and write, 51.1% were unemployed. Almost all (92.3%) had 1-15 years history of diabetes mellitus, most (78.3%) were suffering from many co-morbid disease conditions like hypertension (54.2%), cholesterol (25.3%), hypothyroidism (11.4%), pneumonia (12.2%), ischemic heart disease (12.6%), COPD (9.8%), stroke ((.4%), anemia (8.2%), and BPH (3.3%). Regarding medical expenses, most (76.4%) had different source of expenses like family income (65.7%), self-income (60.2%), insurance (33.4%), old age allowance (14.6%), rent (15.5%), family property (21.7%) and pension (3.3%).

Table 2. Medication Adherence with Respect to GMAS Measuring Items

N=313

Items	Adherence response level n(%)			
	Always	**Mostly**	**Sometimes**	**Never**
Do you have difficulty in remembering to take your medications?	25(8)	62(19.8)	143(45.7)	83(26.5)
Do you forget to take your medication due to your busy schedule, travelling, meeting, events at home, party, marriage, religious celebrations, etc.?	13(4.2)	49(15.7)	140(44.7)	111(35.5)
Do you discontinue your medication when you feel well?	21(6.7)	38(12.1)	128(40.9)	126(40.3)
Do you stop taking medications when you feel adverse	18(5.8)	38(12.1)	98(31.3)	159(50.8)

Items	Adherence response level n(%)			
	Always	Mostly	Sometimes	Never
effects such as gastric discomfort, etc.?				
Do you stop taking medications without informing the doctor?	13 (4.2)	45(14.4)	107(34.2)	147(47)
Do you discontinue your medicines due to other medicines that you have to take for your additional disease?	16(5.1)	38(12.1)	120(38.3)	139(44.4)
Do you find it is a hassle to remember your medications due to medication regime complexity?	16(5.1)	40(12.8)	116(37.1)	141(45)
During the last month, had there been any occasion when you missed your medicines due to progression of disease and addition of new medicines?	17(5.4)	41(13.1)	113(36.1)	142(45.4)
Do you alter medication regimen, dose and frequency by yourself?	15(4.8)	36(11.5)	107(34.2)	155(49.5)
Do you discontinue these medications because they are not worth of the money you spent on them?	8(2.6)	24(7.7)	108(34.5)	173(55.3)
Do you find it difficult to buy your medicines because they are expensive?	6(1.9)	25(8.0)	94(30.0)	188(60.1)

Table no. 2 shows medication adherence with respect to GMAS measuring items where 26.5% never find difficulty in remembering medication intake, 35.5% never forget to take medication due to busy schedule, 40.3% never discontinue medication while feeling unwell, more than half (50.8%) never stop medication due to its adverse effects while

47% never stop taking medications without informing doctor. Similarly, 44.4% never discontinue taking anti diabetic medicine due to other medicine use, 45% never find hassle to remember medications due to complex regimen, 45.4% never missed his/her medicines intake in the last month due to disease progression and additional new medicine, 49.5% never alter medication regimen, dose and frequency by themselves, more than half (55.3%) have never discontinue taking medications as its worth of money they have spent on them as well as 60.1% of respondents never find difficulty to buy medicine.

Table 3. Overall Medication Adherence Among Respondents

n=313

Variables	**Frequency**	**Percentage**
Non Adherent	193	61.7
Adherent	120	38.3
Total	**313**	**100**

Table 3 shows majority (61.7%) of the respondents were non-adherent to anti-diabetic medications.

Table 4. Association between Level of Medication Adherence and Personal Information

n=313

Variables	**Level of Medication adherence**		χ^2	***p* value**
	Non Adherent n(%)	**Adherent n(%)**		
Age				
21-39	21 (63.6)	12 (36.4)	0.883	0.643
40-59	86 (58.9)	60(41.1)		
60 and above	86(64.2)	48(35.8)		
Gender				
Male	96(60.0)	64(40.0)	0.382	0.562
Female	97(63.4)	56(36.6)		

Variables	Level of Medication adherence		χ^2	*p* value
	Non Adherent n(%)	Adherent n(%)		
Marital Status				
Married	143(59.3)	98(40.7)	2.514	0.285
Widow/widower	16(66.7)	8(33.3)		
Divorced	34(70.8)	14(29.2)		
Educational Status				
Literate	137(65.2)	73(34.8)	3.453	0.065
Illiterate	56(54.4)	47(45.6)		
Occupation				
Unemployed	96(60.0)	64(40.0)	0.382	0.562
Employed	97(63.4)	56(36.6)		
Family History				
Yes	123 (60.3)	81(39.7)	0.463	0.543
No	70(64.2)	39(35.8)		
Co-morbidity				
Yes	143(58.4)	102(41.6)	5.176	0.024#
No	50(73.5)	18(26.5)		
Medical expenses				
Yes	138(57.7)	101(42.3)	6.574	0.013#
No	55(74.3)	19(25.7)		
Duration of DM				
1-15	178(61.16)	111(38.4)	0.008	1.000
16-30	15(62.5)	9(37.5)		

Table 4 shows there is a statistically significant association between level of medication adherence with co-morbidity conditions (p=0.024) and medication expenses (p=0.013).

DISCUSSION

Patient adherence to anti-diabetic medication is essential in preventing the undesirable complications of diabetes and reducing the utilization of healthcare resources. According to the findings of this study, 38.3% of the respondents were adherent to the anti-diabetic medication which is inconsistent with the study conducted in Jazan Province, Saudi Arabia which shows 66% of respondents were adherent to medications (Khardali et al., 2024). Also, the finding is inconsistent with a study conducted in Morocco, North Africa which shows 90.30% were high adherent to medication (Maryam et al., 2023). The variations in the results might be due to differences in sample size and setting.

The study showed that there was a statistically significant association between respondents' level of medication adherence with co-morbid condition (p=0.024). The finding is consistent with the study conducted in Jazan Province, Saudi Arabia which shows that there is statistically significant association between level of medication adherence with co-morbidities (p=0.001) (Khardali et al., 2024). While the finding is inconsistent with the study conducted in Biratnagar, Nepal which showed that there is a statistically significant association between the level of medication adherence with co-morbidities (p=0.393) (Shah et al., 2024). The study also showed that there was a statistically significant association between respondents' level of medication adherence and medication expenses (p=0.013).

The study showed that there was no statistically significant association between respondents' level of medication adherence with educational status which is consistent with the study conducted in Khobar City, Saudi Arabia that revealed both educated and uneducated patients had an equal chance of being adherent to medication of DM (Alqarni et al., 2019).

This study also showed that there was no statistically significant association between respondents' level of medication adherence with age, gender and employment status which is inconsistent with the study conducted in Chongqing, China which shows that level of adherence is associated with age (p=0.028), gender (p=0.020) and employment status (p=0.011). This difference in the result might be due to sample size (Huang et al., 2021).

The study was conducted in a single setting so the results of this study might not represent the total population. Recall bias might also be one of the major limitations of the study.

Conclusion

Based on the study findings, it is concluded that among 313 diabetic patients, only 38.3% were adherent to their anti-diabetic medications. There is a statistically significant association between the level of medication adherence with co-morbidity conditions and medication expenses. Hence, medication adherence is important for glycemic control and reduction in the onset or progress of the complications so the concerned nurses and doctors working in the medicine department of the hospital is recommended to conduct awareness programs and counseling sessions for diabetic patients regarding diabetes mellitus and its management.

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Author's Contributions:

Sachi Prajoo: Conceptualization, analysis, investigations, original draft, review and editing; Deepa Aryal: Literature review, analysis, review and editing; Anupama Pradhan Thaiba: Literature review, analysis, original draft, review and editing; Nira Neupane: Literature review, analysis; Melina Gyawali: Conceptualization, methodology, review and editing.

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