



## “A STUDY ON MEDICATION ADHERENCE AMONG PATIENTS WITH TYPE 2 DIABETES MELLITUS ATTENDING GOVERNMENT HEALTH CARE FACILITIES OF RAIPUR DISTRICT”

<b>Dr Nasarin Parveen</b>	PG scholar, department of community medicine, Pt. J. N. M. MEDICAL COLLEGE, RAIPUR (Pt.J.N.M.) (C.G.).
<b>Dr Shubhra A Gupta</b>	Associate professor dept of community medicine Pt.J.N.M. Raipur (C.G).
<b>Dr Smita Verma</b>	Assistant professor, dept of community medicine Pt.J.N.M. Raipur (C.G).
<b>Dr Nirmal Verma</b>	professor, dept of community medicine Pt.J.N.M. Raipur (C.G).

**ABSTRACT** **Introduction:** Diabetes mellitus is a chronic progressive disorder characterized by high levels of blood glucose. Patient's role in medication adherence is inversely proportional to the severity & complication of diabetes. Adherence to medication is essential to obtain a therapeutic benefit for diabetes. Hence, this study has been conducted to assess medication adherence among patients with type 2 diabetes mellitus attending government healthcare facilities of the Raipur district. **Objective:** To find out the magnitude of adherence to prescribed medication among type 2 diabetic patients attending government health care facilities of Raipur district. **Material And Method:** A facility based cross-sectional study was conducted in government health care facilities selected by simple random sampling of Raipur district during November 2020 to November 2022. A total of 460 patients with more than 6 months duration of type-II Diabetes Mellitus were interviewed by using structured questionnaire after obtaining verbal consent from them. Medication adherence were assessed on Morisky medication adherence Scale (MMAS-8 scale) from the range of 0 to 8. If patients scored maximum 8 considered as high adherence, if patients scored 6-7 considered as moderate adherence, if patients scored of <6 considered as poor adherence. **Result:** Out of 460 study subjects, it was observed that about 21% were found highly adherent to medications, 28% moderately adherent and 51.1% were showing low adherence for diabetic medication. **Conclusion:** Overall medication adherence was very low in study subjects. It is clear that there is a serious need for healthcare professionals to address the problem of adherence to prescribed medications to individuals with diabetes mellitus.

**KEYWORDS :** Diabetic Mellitus, MMAS-8 scale. Medication Adherence, Raipur.

### INTRODUCTION

Diabetes mellitus is no longer a disease of predominantly rich community, the prevalence of diabetes is increasing everywhere. There are mainly two types of diabetes, type 1 or Insulin dependent and type 2 diabetes. Type 2 diabetes is called non-insulin-dependent or adult-onset. This results from the body's ineffective use of insulin. More than 95% of people with diabetes have type 2 diabetes. [1]

According to the World Health Organization (WHO), non-communicable diseases (NCDs) accounted for 74% of deaths globally in the year 2019. Out of this, diabetes accounted for 1.6 million premature deaths of people, that is death before reaching the age of 70 years. Thus, diabetes has become the 9th leading cause of global death. By the year 2035, nearly 592 million people are predicted to die of diabetes. [2]

As per International diabetes federation 2021, India accounts for 1 in 7 of all adults living with diabetes worldwide. Age adjusted prevalence of people with diabetes (20–79 years) in India is 9.6% which corresponds to 74.2 million people. (4) The burden of diabetes in India has been increasing steadily since 1990. The pace become faster since the year 2000. The prevalence of diabetes in India has risen from 7.1% in 2009 to 8.9% in 2019. [3]

Medication adherence has been defined by the International Society for Pharmacoeconomics and Outcomes Research as the "extent to which a patient acts in accordance with the prescribed interval and dose of a dosing regimen." [4]

Inadequate medication adherence is a major factor leading to poor and suboptimal glycaemic control among patients with DM, which catalyzes the magnitude of this problem and leads to the development of diabetic-related complications. This scenario potentiates the progression of the disease, hospitalization, pre-mature disability, and mortality. [5]

Hence, the present government health facility-based study was conducted to find the prevalence of adherence to diabetic medication. The finding of the study will be helpful in addressing barrier of medication adherence when developing programs for noncommunicable diseases at a patient level.

### AIM

To study Medication Adherence among patients with type 2 Diabetes

Mellitus attending Government Health Care Facilities of Raipur District.

### OBJECTIVES

To find out the magnitude of adherence to prescribed medication among type 2 diabetic patients attending government health care facilities of Raipur district.

### METHODOLOGY

- **Study Design:** Descriptive cross sectional observational study.
- **Study Area:** Government Health Care Facilities of Raipur district (Dharsiwa CHC, Abhanpur CHC, Gudhyari CHC, Khokhopara UPHC)
- **Study Duration:** November 2020 to November 2022. Collection of data has been done from April 2022-July 2022.
- **Study Subject:** Type 2 diabetic patient who were coming to government health care facilities.

### Inclusion Criteria:

1. Type 2 diabetic patient of more than 18 years of age who were ambulatory and put on antidiabetic medication for  $\geq 6$  months.
2. Type 2 diabetic patient willing to participate in the study.

### Exclusion Criteria:

1. Patients with type I diabetes mellitus.
2. Women with gestational diabetes mellitus.
3. Unconscious or seriously ill patients or patients having mental illness.
4. Who did not give consent to participate in the study or who have diagnosed of diabetes within 6 months.

**Sample Size:** 460 study subjects.

**Sampling method:** Simple random sampling method was used to select the study centre. Consecutive sampling technique was used to select the patients from government health centres and to collect data from them during data collection period.

**Study tools:** Pre-designed, pre-tested semi-structured questionnaire related to sociodemographic profile such as (age, gender, education

status, socioeconomic status) and diabetic morbidity characteristics (duration of diabetes, family history, comorbidity other than diabetes) and treatment profile (presentation and detection of diabetes, pattern of medication, history of hospitalization due to diabetic complication). MMAS-8 [6] structured questionnaire to assess medication adherence of patient. This was a eight -item scale, first seven questions are dichotomous (yes/no) questions, where “Yes” is scored as 0 & “No” as 1. Except for the question number 5 which is reverse that is, “Yes” is scored as 1 & “No” as 0. For item number 8, if the patients respond “never/rarely” the score is 1, if response all the time is chosen the score is 0. The responses to usually, sometimes and once in a while are rated respectively as 0.25, 0.50, 0.75. Thus, total score of the scale came out to be 8. pilot study was done and then final data collection was proceeded.

- High adherence - score of 8
- Moderate adherence - scores of 6-7
- Low adherence –scores <6

After categorization the different variables were expressed as percentages.

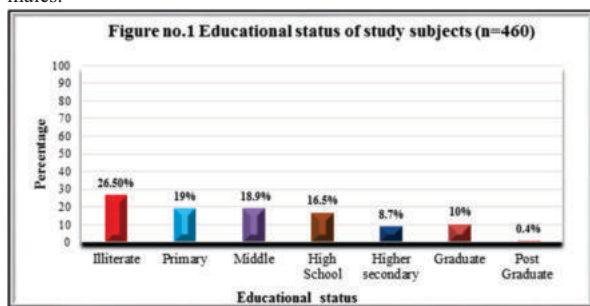
- **Study Technique:** The study was done by interview method.
- **Consent:** Informed verbal consent has taken from all the participants prior to the study. Confidentiality and anonymity of information of study subjects were maintained.

**RESULT AND OBSERVATION**

**Table No. 1: Age And Gender Wise Distribution Of Study Subjects (n=460)**

AGE GROUP (In Years)	GENDER				TOTAL	PERCENTAGE
	FEMALE		MALE			
	Frequency	Percentage	Frequency	Percentage		
≤40 Years	3	0.7	2	0.4	5	1.1
40-49	24	5.2	10	2.2	34	7.4
50-59	43	9.3	41	8.9	84	18.3
60-69	95	20.7	73	15.9	168	36.5
70-79	67	14.6	66	14.3	133	28.9
≥80	17	3.7	19	4.1	36	7.8
Total	249	54.1	211	45.8	460	100

It can be observed from the above table that, out of 460, majority 36.5% of study subjects belonged to age group 60-69 years, followed by 28.9 % from 70-79 years and 18.3% from 50-59 years. A lesser number of subjects i.e. 7.8% were from ≥80 and 7.4% were from 40-49 years. Only 1.1% were of 30- 39 years age. In the present study majority, 54.1% of the study population were females and 45.8% were males.



From the above figure it has been interpreted that, majority (26.5%) of the study subjects were illiterate, wherein 19.0% had completed their primary school education. Rest 18.9%, 16.5%, 8.7%, 10% and 0.4% were educated up to middle, high school, higher secondary, graduate and post graduate respectively.

**Table No.2: Socioeconomic Status Of Study Subjects (as Per Modified BG Prasad Scale) (n=460)**

SOCIOECONOMIC STATUS	FREQUENCY	PERCENTAGE
Upper	35	7.6
Upper middle	212	46.1
Middle	101	22.0
Lower middle	80	17.3
Lower	32	7.0

Total	460	100.0
-------	-----	-------

It has been observed from the above table that, the majority (46.1%) of study subjects belonged to upper middle class followed by the middle class (22.0%) and lower middle class (17.3%). Only (7.6%) and (7.0%) participants were belonging to upper class and lower class respectively.

**Table No. 3: Morbidity Characteristics And Treatment Profile Of The Study Subjects (n= 460)**

VARIABLES	FREQUENCY	PERCENTAGE
<b>DURATION OF DIABETES (In years)</b>		
6 months- 1 years	79	17.2
1-5 years	197	42.8
More than 5 years	184	40.0
<b>FAMILY HISTORY OF DIABETES</b>		
Present	232	50.4
Absent	228	49.5
<b>COMORBIDITY OTHER THAN DIABETES</b>		
Present	381	82.8
Absent	79	17.2
<b>IF PRESENT THEN TYPE OF COMORBIDITY (n=381)</b>		
Hypertension	323	84.7
Stroke	8	2.0
Cardiovascular disease	4	1.04
Any type of cancer	0	0
Multiple response	46	10.0
<b>PRESENTATION &amp; DETECTION OF DIABETES</b>		
Presented with symptoms	330	71.7
Detected incidentally	130	28.3
<b>PATTERN OF MEDICATION</b>		
Single drug	345	75.0
More than one anti-diabetic drug	115	25.0
<b>HISTORY OF HOSPITALIZATION DUE TO DIABETIC COMPLICATION</b>		
Present	67	14.6
Absent	393	85.4

Above table described that, 42.8% were diagnosed with diabetes between 1-5 years. 40.0% have diabetes >5 years. 17.2% subjects diagnosed with diabetes between 6 months to 1 year duration. Among 460 subjects, about half 50.4% subjects had family history of diabetes. Another important finding about diabetes status of study subject was majority, 82.8% of the study subjects were having comorbidity other than the diabetes which includes hypertension in 84.7%, history of stroke in 2%, & CVD in 1% subjects.

The majority of the study subjects 71.7% were diagnosed, when they suffered from symptoms of diabetes. It is also worth to note that about 28.3% of the diabetics were not having any symptoms or complaints and they were diagnosed incidentally.

Out of 460 study subjects, 75.0% were put on single drug, while 25.0% were prescribed more than one anti-diabetic drug for the treatment of diabetes. 14.6% had a history of hospitalization due to diabetic complications.

**MORISKY MEDICATION ADHERENCE SCALE**

**Table No.4: Distribution Of Study Subject According To Medication Adherence (n=460)**

QUESTIONS	Response	Frequency	Percentage
1   Do you sometimes forget to take your medications?	YES	202	43.9
	NO	258	56.0
2   Thinking over the past two weeks, were there any days when you did not take your medications other than the reason of forgetting?	YES	223	48.4
	NO	237	51.5
3   Have you ever cut back or stopped taking your medications without telling your doctor, because you felt worse when you took it?	YES	167	36.3
	NO	293	63.6

4	When you travel or leave home, do you sometimes forget to bring along your medications?	YES	105	22.8
		NO	355	77.1
5	Did you take your medications yesterday?	YES	414	90
		NO	46	10
6	When you feel like your health condition is under control, do you sometimes stop taking your medications?	YES	41	8.91
		NO	419	91.0
7	Do you ever feel hassled about sticking to your treatment plan due to inconvenience?	YES	4	0.86
		NO	456	99.1
8	How often do you have difficulty in remembering to take all your medications?	NEVER/RARELY	67	14.5
		ONCE IN A WHILE	346	75.2
		SOMETIME	25	5.43
		USUALLY	0	0
		ALL THE TIME	22	4.7

All the above questions except question number five. Answer of subjects as “NO” denote they are adherent to their medication and “YES” indicate they are not adherent for question number five “YES” denote adherence & vice versa for number.

The above table described variables related to medication adherence, 56% of study participants did not forget to take medication and 51.5% said that they forget to take medicine in the past two week. So there was no reason like forgetting above medicine. 63.3% said they never ever let back or stopped taking their medication in any condition, 77% said they always take their medicine while travelling or leaving home. Maximum proportion (more than 90%) of subjects admitted that, they never felt in problem sticking to the treatment plan due to inconvenience or stop taking treatment, when they felt their health condition is under control. 90% of study participants took medication on previous day.

Above table showed that 75.2% majority said they have once in a while or occasional have difficulty in remembering to taking all their medicine. Whereas 14.5% admitted they never feel so. This was a positive finding because medication adherence is one of important strategy to control diabetes. 5.43% said they sometime do so. But there were another 4.7% patients who admitted that they all the time felt difficulty.

**Table No.8 : Grading Of Adherence To Diabetic Medication (n=460)**

TOTAL SCORE	FREQUENCY	PERCENTAGE
Low	235	51.1
Moderate	129	28
High	96	20.9
Total	460	100.0

When categorization of medical adherence of diabetics was done, 51.1% of the study subjects were found to be with low medication adherence while, 28% had moderate adherence. Only 21% came under the category of high medication adherence. These subjects need to explore why this happened with them. They also required proper counselling so that they can stick to medication adherence.

**DISCUSSION**

The current study was conducted among type 2 diabetic patients coming to the government health care facilities of Raipur district from November 2020 to November 2022. The primary aim of the study was to assess the adherence to prescribed medication among type 2 diabetic patients attending government health care facilities of Raipur district. Total study subjects were 460.

After taking informed verbal consent from the study subjects their sociodemographic details and diabetic profile were collected. They were also interviewed by using validated structured MMAS-8 scale for assessment of adherence.

As per MMAS-8 scale, about 21% were found highly adherent to medications, 28% moderately adherent and 51.1% were showing low adherence for diabetic medication. **Srividya V et al.** [6] found that, adherence level was 16.67%, 60.67% and 22.66% for high, moderate, low adherence respectively in their study. **Arulmozhi et al.**[7]

conducted a study in Puducherry using MMAS-8 scale also reported Only 49.3% of the subjects adhered to anti-diabetic medications.

**CONCLUSION**

From the above finding it can be concluded that medication adherence was very low in study subjects. Once a person is diabetic, he remains for his whole life is a truth. Still his diabetic status i.e. Whether he/she is an old diabetic, having a genetic predisposition, comorbidity, hospitalization history, taking more than one drug etc, a person can live a healthy life if he/ she is taking the medication regularly, and living a healthy life style.

**REFERENCES**

- <https://www.who.int/news-room/fact-sheets/detail/diabetes>
- Tao Z, ShiA, Zhao J. Epidemiological perspectives of diabetes. *Cell Biochem Biophys* 2015;73:181-
- International Diabetes Federation. *IDF Diabetes Atlas*. 10th ed. Brussels, Belgium: International Diabetes Federation; 2021.
- Venkatesan M. Et al A Community- Based Study on Diabetes Medication Nonadherence and its Risk Factors in Rural Tamil Nadu Indian Journal of Community Medicine| Vol.43 | Issue 2 |April- June 2018.
- Araya EM, Gebrezgabihier HA, Tekulu GH, Alema NM, Getnet D, Gebru HT, et al. Medication non-adherence and associated factors among diabetic patients visiting general hospitals in the Eastern Zone of Tigray, Northern Ethiopia. *Patient Prefer Adherence* [Internet].2020;14:2071–83<https://www.dovepress.com/getfile.php?fileID=63058> [https://www.who.int/news-room/fact-sheets/detail/diabetes](https://www.who.int/news-room/fact-sheets/detail/diabeteshttps://www.who.int/news-room/fact-sheets/detail/diabetes)
- Srividya V. et al. Adherence to medications among adults with diabetes mellitus in the urban field practice area of a private medical college in Bangalore, Karnataka, India *Public Health Rev: Int J Public Health Res* 2019;6(5):200-6. Available from: [Internet] <http://dx.doi.org/10.17511/jphr.2019.15.04>
- SA, TM. Self care and medication adherence among type 2 diabetics in Puducherry, southern India: A hospital based study. *J Clin Diagn Res* [Internet]. 2014;8(4):UC01-3. Available from: