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Assessment of medication adherence and social influences among hospitalized diabetic patients

[1*]D Sai Harsha Vardhan, [2]Niladri Chakraborty, [3]Danial Esfandiari,
[4]Saroj Kumar Yadav, [5]Dr. Kannan G

[1]PharmD Intern, Acharya & BM Reddy College of Pharmacy, Bengaluru, India.

Abstract: **Achieving optimal medication-taking behavior is of central importance in diabetes resolution. It is the result of a healthy collaboration between the healthcare provider and the patient. Social support plays a role in diabetes-specific quality of life and self-care activities. It encompasses multiple dimensions that differentially influence specific diabetes health-related outcomes and behaviors. Certain social support interventions are known to affect self-care activities and outcomes in diabetic patients. Social influences dictate dietary as well as medication-taking behaviors. They are of central importance in diabetes care. Having adequate understanding of adherence and social influences is vital for improving outcomes. This study was performed to assess medication adherence and social influences in diabetes inpatients. A self-designed questionnaire was employed to assess medication adherence in patients previously diagnosed with DM, who were already on medication and to collect information related to social influences. The patients were identified from their case report forms. The patients previously diagnosed with DM or their carers were asked 5 questions for assessment of adherence to anti-diabetic medications prior to their admission to the hospital. For assessing social influences, the patients were asked 3 questions related to their family influences. Our findings emphasize on the need to conduct a serious intervention in drug use by improving patients' compliance to physicians' prescription. We encourage the use of novel techniques to mitigate the compliance problems in diabetic patients. 56% patients reported that one or more member(s) in their family apart from themselves had DM. 63.4% patients admitted that their family members were aware of their DM. 35.8% patients reported that their family members encouraged them to indulge in physical activity and diet control. It is necessary to counsel family members regarding the importance of early diagnosis of DM, the warning signs for DM and the need to indulge in regular exercise and diet control to prevent or mitigate DM.**

Keywords: **Self-care, medication adherence, diabetes mellitus, social influences, family influences.**

I. INTRODUCTION

Diabetes mellitus (DM) requires constant attention to diet, exercise, glucose monitoring and drug therapy to achieve good glycemic control. Adequate compliance with prescribed medication regimen is crucial in glycemic control. Better outcomes are only achieved if medications are taken according to the prescribed regimens. World Health Organization (WHO) has promoted the term "adherence" for use in chronic disorders as "the extent to which a person's behavior—taking medication, following diet, and/or executing lifestyle changes—corresponds with agreed recommendations from a health care provider".[1] A systematic review confirmed that several diabetic patients took less than the prescribed amount of medication, including both oral hypoglycemic agents and insulin.[2] Achieving optimal medication-taking behaviour is of central importance in diabetes resolution. It is the result of a healthy collaboration between the healthcare provider and the patient. Social support plays a role in diabetes-specific quality of life and self-care activities. It encompasses multiple dimensions that differentially influence specific diabetes health-related outcomes and behaviors.[3] Certain social support interventions are known to affect self-care activities and outcomes in diabetic patients.[4] Social influences dictate dietary as well as medication-taking behaviors. They are of central importance in diabetes care. Having adequate understanding of adherence and social influences is vital for improving outcomes. This study was performed to assess medication adherence and social influences in diabetes inpatients.

II. METHODOLOGY

This observational study was conducted in the in-patient wards of Department of General Medicine at the 500-bedded ESIC-MC PGIMSR & Model Hospital, Rajajinagar. Data was collected over a period of 3 months. Information relevant to the study was collected from all patients meeting inclusion and exclusion criteria admitted during the data collection period and documented.

STUDY CRITERIA

Inclusion criteria:

a) Patients presenting with uncontrolled DM and diabetic complications.

b) Patients admitted to the in-patient wards of Department of General Medicine.

c) ESIC card holders.

Exclusion criteria:

a) Pregnant women.

b) Out-patients and patients admitted to departments other than Dept. of General Medicine.

c) Patients who cannot respond verbally, unconscious patients and comatose patients.

SOURCE OF DATA

The data was collected from the in-patients of the Department of General Medicine. The different sources of data used were:

- Case report forms.
- Interactions with patients, carers, nurses and physicians.
- Medication charts/prescriptions.
- Laboratory reports.

STUDY MATERIALS

- Patient data collection form: Data was collected by using a self-designed data collection form. Details like unique identification number, demographic details, laboratory data, medication chart and other relevant data were captured.
- A self-designed questionnaire to assess medication adherence in patients previously diagnosed with DM, who were already on medication and to collect information related to social influences.

The patients were identified from their case report forms. The patients previously diagnosed with DM or their carers were asked 5 questions (Q1-Q5) for assessment of adherence to anti-diabetic medications prior to their admission to the hospital. For assessing social influences, the patients were asked 3 questions (Q1-Q3) related to their family.

III. RESULTS

Gender distribution:

In our hospital-based observational study conducted in DM in-patients, 136 in-patients with uncontrolled DM admitted to the Department of General Medicine were studied. Out of 136 study subjects, 51.5% (n=70) were females and 48.5% (n=66) were males.

Age distribution:

In our study, all subjects with uncontrolled DM admitted to the Department of General Medicine from January, 2018 to March, 2018 were included. The youngest subject was 22-year-old and the oldest subject was 88-year-old. The mean age of the study subjects was found to be 57.63±12.22 years. The study subjects were divided into 4 different age groups as *20-39*, *40-59*, *60-79* and *80-99 years* (TABLE I).

TABLE I: Age-group distribution of study patients.

Age-group	Number (n)	Percentage (%)
20 - 39 years	10	7.35
40 - 59 years	66	48.53
60 - 79 years	58	42.65
80 - 99 years	2	1.47

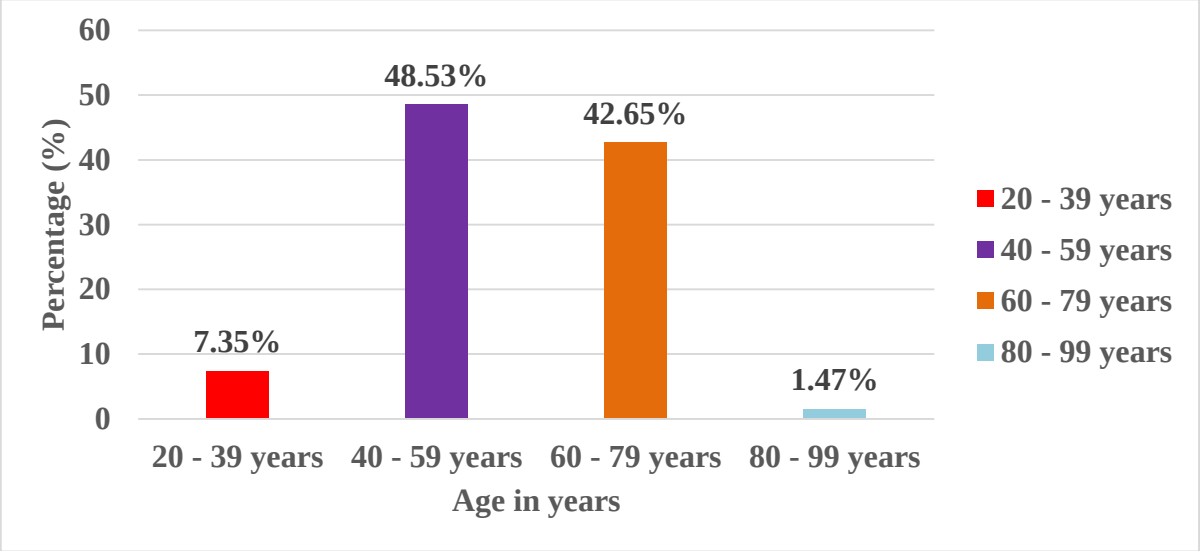

Fig. 1: Age-group distribution of study patients.

All patients had DM as a secondary diagnosis. Out of 136 study subjects studied, 92% (n=125) were known cases of T2DM, 5.1% (n=7) were newly diagnosed cases of T2DM and 2.9% (n=4) were known cases of T1DM.

Assessment of medication adherence and social influences:

I) Medication adherence in patients already on anti-diabetic medications prior to hospitalization:

A self-designed questionnaire was employed to assess the medication adherence among patients who were already taking anti-diabetic medications prior to hospital admission. Out of 136 study patients, 7 were newly diagnosed cases of DM, while the remaining were diagnosed before admission. The questionnaire had 5 close-ended (Yes/No) questions relevant to the assessment of a patient's compliance to anti-diabetic prescription. 129 patients answered the questions.

Q1: *How often do you forget to take your anti-diabetic medicines?* (TABLE II)

Q2: *Have you ever cut back or stopped taking your medication without telling your doctor, because you felt worse when you took it?* (TABLE III)

Q3: *When you feel like your DM is under control, do you sometimes stop taking your medicine?* (TABLE III)
Q4: *Did you take your medicine a day before your admission here?* (TABLE III)

Q5: *Do you ever feel hassled about sticking to your DM treatment plan?* (TABLE III)

Table II: How often do you forget to take your anti-diabetic medicines? (Q1).

Q1	Number (n)	Percentage (%)
Regularly	**20**	**15.7%**
Frequently	**20**	**15.7%**
Occasionally	**49**	**37.8%**
Rarely	**40**	**30.8%**

TABLE III: Percentages of 'Yes' and 'No' answers for questions Q2 to Q5 for assessment of anti-diabetic medication adherence.

Question no.	Yes (n)	No (n)	Yes%	No%
Q2	60	69	46.5%	53.5%
Q3	64	65	49.6%	50.4%
Q4	57	72	44.2%	55.8%
Q5	81	48	62.8%	37.2%

II) Social influences:

Familial influence on DM care was assessed by asking three close-ended (Yes/No) questions:

Q1: *Does anyone else have DM in your immediate family?*

Q2: *Are your immediate family members aware of your DM?*

Q3*: Do they encourage you to indulge in physical activity and diet control?*

TABLE IV: Percentages of 'Yes' and 'No' answers for questions Q1 to Q3 for assessment of social influences.

Question no.	Yes (n)	No (n)	Yes%	No%
Q1	76	60	56%	44%
Q2	86	50	63.4%	36.6%
Q3	49	87	35.8%	64.2%

IV. DISCUSSION

We assessed our patients' medication adherence and social influences to cater to our objective of improving their health outcomes by understanding the current challenges. 15.7%, 15.7% and 37.8% patients admitted to forgetting to take anti-diabetic medications regularly, frequently and occasionally, respectively. Only 30% patients admitted to forgetting to take anti-diabetic medications rarely. 46.5% patients admitted to cutting back or stopping to take their medication without telling their physicians, because they felt worse when they took the medications. 49.6% patients admitted to stopping to take their anti-diabetic medicines when they felt like their DM was under control. 44.2% patients took their medicines a day before their admission to hospital. 62.8% patients felt hassled about adhering to DM treatment plan regularly. Our findings emphasize on the need to conduct a serious intervention in drug use by improving patients' compliance to physicians' prescription. We encourage the use of novel techniques to mitigate the compliance problems in diabetic patients. 56% patients reported that one or more member(s) in their family apart from themselves had DM. 63.4% patients admitted that their family members were aware of their DM. 35.8% patients reported that their family members encouraged them to indulge in physical activity and diet control. It is necessary to counsel family members regarding the importance of early diagnosis of DM, the warning signs for DM and the need to indulge in regular exercise and diet control to prevent or mitigate DM.

V. CONCLUSION

Poor medication adherence was observed in patients diagnosed with DM prior to hospital. Stringent steps are needed to be adopted to address and mitigate the issue of inappropriate medication-taking behavior. Similar studies are needed to be performed across various Indian healthcare settings to establish more credible conclusions. The link between social influences and medication adherence has been clearly established. It is imperative that healthcare professionals and institutions work on advocating social support improvement strategies. Outreach programs must be organized for family members and friends of diabetic patients. The patients must be constantly informed the need of indulging in appropriate medication-taking practices. Their family members are required to be educated on diabetes diet, exercise, glycemic control, early signs of complications and diabetes pharmacotherapy. Elderly patients necessitate special care. We suggest personalized care plans for patients for optimal outcomes. Diabetes educational leaflets, online resources, newspaper campaigns, classroom advocacy and hospital outpatient counseling are among the viable means of outreach that could be adopted by healthcare professionals, institutions and caregivers.

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