Original Research Article

Health literacy in type 2 Diabetes Mellitus Patients: A Questionnaire-based Study

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Abstract

Introduction: Health literacy related to diabetes mellitus can lower the likelihood of prolonged hospitalization, healthcare expenses, and poor health outcomes in diabetic patients. Thus, they can lead a good quality of life. Hence, we planned to assess the effect of diabetic health literacy on self-care and complications among rural and urban diabetic patients.

Methods: A cross-sectional study was conducted. Written informed consent was obtained. Patient's details were collected using pre-designed proforma. Questionnaire was validated with Cronbach's alpha 0.7 before administering it to patients. It consisted of 12 questions pertaining to diabetes mellitus, its treatment, and complications. Data were analyzed using descriptive statistics and unpaired t-test.

Results: Fifty patients each were from urban and rural regions. Mean age was 51.84±13.22years in urban and 54.16±11.80years in rural population. Health literacy related to diabetes mellitus among urban and rural participants was statistically insignificant with regard to normal blood glucose levels (BGL), frequency of their monitoring, diabetic diet and awareness of symptoms associated with high and low BGL. The urban individuals could tell the names of the medications($p=0.025$). Selfcare like compliance to treatment, exercise, and measures to reduce worsening of hypoglycaemia features were similar among urban and rural individuals but adherence to diet for diabetes was observed in patients from rural areas ($p=0.003$). Awareness regarding long term effects like diabetic foot, cardiovascular complications were similar in both urban and rural patients.

Conclusion: Health literacy related to diabetes in urban and rural patients was similar however those from rural regions were adherent to diabetic diet.

Keywords: Type 2 diabetes mellitus, Health literacy related to diabetes mellitus, Self-care for glycemic control in Urban and rural population, Adherence to medication in diabetes mellitus, Health literacy and complications due to diabetes mellitus.

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Introduction

Health literacy is an individual's ability to acquire, understand and act on suitable health information. In any healthcare system, patient involvement is essential in effectively managing disease, especially lifestyle-related diseases requiring self-care.[1] Low health literacy in patients suffering from chronic disease states may lead to poor disease control, complications necessitating prolonged hospitalization, high healthcare costs and adverse health outcomes.[2] Most prevalent chronic disorder is type 2 diabetes mellitus. This can be a good model for studying health literacy among patients, as this clinical condition requires self-care and a proper understanding of pharmacological and non-pharmacological therapy.[3]

Diabetes mellitus is a metabolic disorder influenced by environmental factors like living standards, urban migration and lifestyle changes. [4] Adequate health literacy among diabetic patients can benefit them in understanding the preventive measures and available treatment options. This knowledge may contribute to self-management through lifestyle modifications, dietary changes, following the medication instructions and adhering to treatment regimens for optimal control of blood glucose levels. These measures may reduce the development of diabetic complications requiring prolonged hospitalization.[5] There are a few Indian studies on health literacy among diabetic patients. However, these studies have not emphasized the exact association between health literacy and its effect on self-management among urban and rural diabetic patients. Hence this study was carried out to evaluate the effect of health literacy on the self-management of type 2 diabetes mellitus among urban and rural patients.

Objectives

1. To assess the effect of diabetic health literacy on self-care among rural and urban diabetic patients using a questionnaire
2. To assess the effect of health literacy on diabetic complications

Materials and Methods

A cross-sectional study was conducted in type 2 diabetes mellitus patients from August 2022 to January 2023. Patients visiting the tertiary care centre who were on oral antidiabetic drugs or insulin were contacted and assessed for diabetic health literacy and self-care using a questionnaire. Patients with a history of diabetes mellitus on treatment for more than one-year duration and of either gender aged 30 years and above from urban and rural areas were included in our study. Patients with a history of dementia, psychiatric disorders, visual and auditory impairment, and multi-organ failure were excluded. The following details were collected as per proforma: age, gender, address, educational qualification, marital status, occupation, income per month and medications for diabetes with their dosage schedule and compliance. Knowledge regarding diabetes mellitus, treatment, complications and other details were collected from the participants using a questionnaire consisting of 12 questions, which was explained to the patient in their language, and the responses were documented. Questionnaire was validated, and Cronbach's alpha value was 0.7.

Analysis & Statistical methods

Demographic details were assessed using descriptive statistics. Responses to the health literacy questionnaire were expressed as percentages. Unpaired t-test was used to compare the response provided by the urban and rural patients. P value <0.05 was considered statistically significant.

Results

A total of 100 type 2 diabetic patients from both urban and rural areas who were on oral antidiabetic drugs or insulin, consented to participate and met the inclusion criteria were assessed for diabetic health literacy and self-care concerning diabetic complications using a questionnaire. Fifty patients each were from urban and rural regions. (Figure 1)

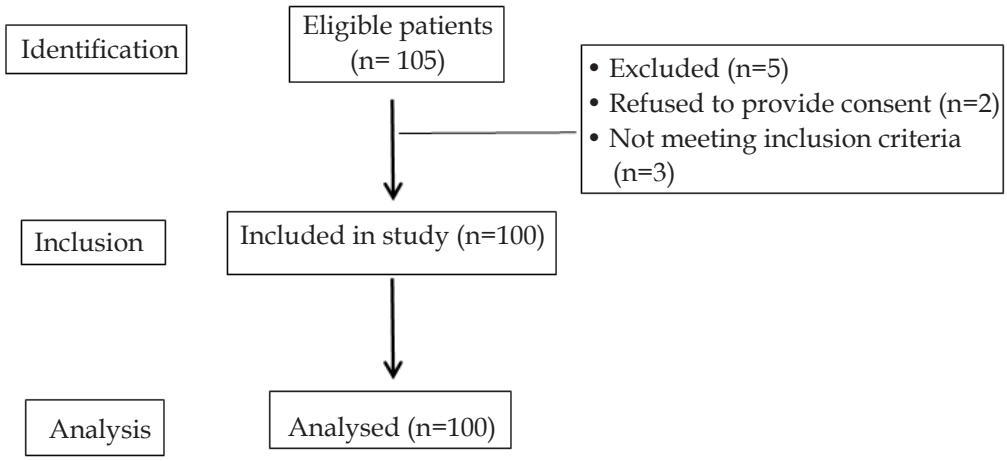

Figure 1: Study flow chart showing patient enrolment and analysis

Table 1: Baseline characteristics between urban and rural population

Parameters	Urban (n=50)	Rural (n=50)	P value
Age in years (Mean±SD)	51.84±13.21	54.16±11.79	0.35
Male/Female	31/19	31/19	---
Educational qualification			
Primary (1-7th)	16	18	0.51
Secondary (8-12th)	19	21	0.64
Graduate	12	11	0.13
Postgraduate	3	NIL	0.08
Duration of diabetes mellitus (years)			
<2	5	4	0.50
2-10	38	39	0.16
11-20	7	7	0.21

*p between groups – unpaired t test

Baseline characteristics were comparable between both urban and rural populations. Number of patients from urban and rural regions were similar with regard to educational qualifications, except that postgraduates were from urban regions only. Most patients had diabetes mellitus for 2-10 years living in urban and rural regions.

Table 2: Comparison of health literacy related to diabetes between urban and rural population

Questions	Urban (%) n =50	Rural (%) n=50	p value
1) What is the normal range of fasting and post-meal blood glucose level?	36	24	0.19
2) What symptoms are experienced when the blood glucose level is high?	52	50	0.84
3) Which medication/s is/are taken by you for diabetes?	50	30	0.02*
4) What diet should be followed by diabetic patients?	26	12	0.07
5) How frequently do you check your blood glucose level? Do you get it checked at home or visit a lab?	80	92	0.08

Continue.....

6) What is the normal range of HbA1c? How often should it be checked?	14	18	0.59
7) What are the symptoms experienced by you when your blood glucose level is low?	60	60	1.00
8) What is the source of information related to diabetes?	82	72	0.001*

*p between groups – unpaired t test

Health literacy related to diabetes among urban and rural participants was statistically insignificant for the responses related to normal range blood glucose levels (BGL), frequency of their monitoring, diet recommended for diabetes and awareness of symptoms associated with high and low BGL. Majority of individuals visited laboratory for estimation of blood glucose levels. Seven from urban and nine from rural regions had knowledge about normal HbA1c values and its frequency of measurement. The urban individuals were able to mention the names of the medications (p=0.025). The source of information concerning diabetes mellitus among urban patients was predominantly doctors.

Table 3: Comparison of self-care between urban and rural population

Questions	Urban (%) n=50	Rural (%) n=50	p-value
1) Were the patients following the frequency of taking diabetic medication/s as instructed?	74	76	0.82
2) Do you miss taking diabetic medication? If so, why? What measures do you follow when you miss?	88	78	0.18
3)Do you exercise? If yes, what are the details of exercise?	42	52	0.32
4) Do you follow the diabetic diet?	58	80	0.003*
5) What do you do to increase your blood glucose level if it is low?	60	60	1.00

*p between groups – unpaired t test

Compliance to treatment and exercise as per the instructions of the consulting physician was comparable between the patients from urban and rural regions. Patients from urban areas informed that they intentionally missed the medications to self assess if the blood glucose levels were within normal range. Based on the outcome, they would decide to either continue to follow the dosage schedule as per the instructions of their physician or miss the dose of the drug. However, rural patients would take the medication as soon as they remember if they have missed a dose. The most commonly followed exercise was walking for 30 minutes every day irrespective of the area of residing. Measure followed to reduce the worsening of hypoglycaemia features, were similar among urban and rural individuals which was to eat a candy carried by them always. Rural patients adopted diet advised to them by their physician (p=0.003). Patients from urban areas were taking medication for diabetes but did not follow diabetic diet.

Knowledge about complications associated with diabetes mellitus was assessed. Sixty percent from urban and 64% from rural areas responded that diabetes can affect kidneys and can cause stroke. Awareness that diabetic foot as a complication was observed in 30%(urban) and 34%(rural) patients and also had the knowledge that they have to regularly examine their feet for injuries. They had the information that the wounds heal slowly. They were aware that these complications can be delayed and minimized if the blood glucose levels are maintained

within the normal range by taking medications as instructed, following the diabetic diet and exercising regularly. Awareness regarding long-term effects like diabetic foot, and cardiovascular complications were comparable between urban and rural area patients.

Discussion

Self-care is important for control of blood glucose levels in diabetic patients. Self-care involves doing exercise consistently, adherence to diet recommended for diabetic patients, compliance to physician instructions for taking medication, regular monitoring of blood glucose levels and follow-up for consultation with specialists for evaluation of diabetic complications like retinopathy, neuropathy, diabetic foot and cardiovascular disorders. Health literacy related to diabetes is one of the impetus for self-care behaviour and treatment of the disease. It is the ability of the patients to have the skills and adeptness to obtain, comprehend, analyze, convey and specify the information related to diabetes both in the hospital setting and everyday activities.

The study was conducted to assess the effect of diabetic health literacy on self care and complications of diabetes mellitus between urban and rural patients. These variables have been studied by other researchers but none of them have compared the diabetic health literacy between two different populations. Age range of the patients was 39-66 years and majority of patients had history of diabetes mellitus for 2-10 years. Graduates were 26 and non-graduates 74, but their representation was similar for both urban and rural areas.

Questions assessing the literacy related to diabetes was comparable between both the populations, though the awareness of medication details and access to information related to diabetes mellitus were significantly higher among urban patients (Table 2). This may possibly be due to their exposure to media like radio, television, social media and internet accessiblilty. In another study, patients who are from urban areas had better health literacy level than those in rural areas.[6]

In our study, self-care with regard to medication adherence was observed in 76% individuals living in rural and 74% in urban regions, but exercise was followed only by 42%(urban) and 52%(rural) individuals. This indicates that patients from rural region were better compliant that urban patients. Even though the 26% of individuals from urban areas were aware of the diet recommended for diabetic patients, the compliance to the diabetic diet was statistically significant among patients living in rural areas (Table 3). A study assessed understanding of the prescription and drug label and the response to the same was lower in elderly and less educated patients. However, these individuals had control over their diet and were regularly taking medication. They were compliant to physical activity and exercised every day despite having low functional and communicative literacy.[2]

Studies have observed that high literacy had influenced towards improvement in self-care and acquiring knowledge related to diabetes, but the association between high literacy and glycemic control, self-monitoring of blood glucose levels, foot care, adherence to diet and medication was inconclusive.[7] This is reflected in our study, as there was no significant difference with relation to health literacy related to diabetes, compliance to medication and exercise (Table 2 and 3).

Adequate glycemic control in diabetes mellitus is dependant on adherence to medication and recommended diet. Several studies had observed that adherence to diet had provided better control of blood glucose level.[8] Hence educating patients about diabetes and also highlight the importance of compliance to medication, diet and exercise both in the hospital setting and at community will help to achieve control of blood glucose levels thus contributing towards prevention or delay in the onset of complications.

Conclusion

Health literacy about diabetes in urban and rural patients was similar, but those from rural areas adhered to diet advised for control of blood glucose levels.

Ethical clearance Taken from institutional ethics committee (Sri Devaraj Urs Medical College) Ref No. DMC/KLR/IEC/ 207/2023-24 dated 15.06.2023

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