

# Quality of Indicators for Effectiveness of Care in Diabetes in Tertiary Care Hospital

N Junior Sundresh<sup>1</sup>, T Santhy<sup>2</sup>, A J Bensam<sup>3</sup>, I Kinzal<sup>4</sup>

<sup>1</sup>Associate Professor, Department of Surgery, Rajah Muthiah Medical College, Annamalai University, Chithambaram, Tamil Nadu, India, <sup>2</sup>Student, Department of Management Studies, Annamalai University, Chithambaram, Tamil Nadu, India, <sup>3</sup>Director, Dr. Bensam Hospital, Nagercoil, Tamil Nadu, India, <sup>4</sup>District Epidemiologist, Directorate of Public Health, Nagercoil, Kanyakumari, Tamil Nadu, India

## Abstract

**Introduction:** Diabetes mellitus, commonly called diabetes, is a condition that makes many people worry about the quality and longevity of their life after being told that they have diabetes. About 18 million people in India are suspected to have diabetes.

**Aim:** The aim of this study to check the quality of care for diabetic patients and its effectiveness and to assess the extent of knowledge in patients regarding diabetes and its complications.

**Materials and Methods:** This cross-sectional study done in all type of diabetic patients who all diagnosed with diabetes at least 1 year before are eligible to participate in the study. The study methodology comprised an audit to assess the quality of care provided to the diabetic patients using the quality indicators for diabetes care.

**Results:** Fifty type 2 diabetes patients were enrolled in the study; 52% of patients are not monitoring the blood sugar level. Seventy percent of patients are not monitoring the glycated hemoglobin (HbA1c) value once in 6 months. Random blood sugar levels of poor knowledge patients were normal (110.83 mg/dl) when compared with good knowledge patients (130.52 mg/dl) which is abnormal. There is no difference in HbA1c and low-density lipoprotein level in respect to knowledge of the patients. Patients with poor knowledge of diabetes are better controlled their blood sugar level than patients known about diabetes.

**Conclusion:** Regular monitoring of diabetes patients is more important in achieving the goals. Hence, health-care provider must create local standards of care and clinical practice guidelines for the management of diabetes which are easily affordable and available.

**Key words:** Awareness, Diabetes, Knowledge, Quality indicators

## INTRODUCTION

Diabetes is a disorder of the chemical reactions that are necessary for proper utilization of carbohydrates, fats, and protein from the diet along with inadequate or lack of insulin. In other words, diabetes results when the body cannot use some foods because of inadequate production of insulin. Insulin is a hormone produced in the pancreas to regulate the amount of blood. Diabetes mellitus, commonly called diabetes, is a condition that makes many

people worry about the quality and longevity of their life after being told that they have diabetes. Anyone can get diabetes, but almost all of them can lead a full, active life with regular control of their diet and medicines. Global report of the WHO revealed that 422 million adults are living with diabetes.<sup>1</sup> In 2030, it may increase to very big number nearly 700 million.<sup>2</sup> Type 2 diabetes occupy 80-90% in that all cases. Type 2 diabetes is more common in developed and developing countries, which predicts that Asia may have large number of diabetic prevalence in 2030.<sup>3</sup> The increase in incidence in developing countries follows the trend of urbanization and lifestyle changes, including increasingly sedentary lifestyles, less physically demanding work, and the global nutrition transition, marked by increased intake of foods that are high energy-dense but nutrient-poor. The risk of getting type 2 diabetes has been widely found to be associated with lower socioeconomic position across countries.<sup>4</sup> According to the Indian Heart

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**Corresponding Author:** T Santhy, House No. 505/B7, Aseerwatham Nagar, Vetturimadam P.O. Nagercoil, Kanyakumari - 629 003, Tamil Nadu, India. Phone: +91-9894084552. E-mail: shanpraison@gmail.com

Association predicted in India by 2035, there would be around 109 million diabetes.<sup>5</sup> The high incidence is attributed to a combination of genetic susceptibility plus adoption of a high-calorie, low-activity lifestyle by India's growing middle class.<sup>6</sup>

### Aim

The aim of this study was to check the quality of care for diabetic patients and its effectiveness and to assess the extent of knowledge in patients regarding diabetes and its complications.

## MATERIALS AND METHODS

This cross-sectional study will be done in diabetic patients visiting outpatient department of the hospital over the period of 1 month. All type of diabetic patients who all diagnosed with diabetes at least 1 year before are eligible to participate in the study. The purpose of the study will be explained to the patients, and informed consent will be taken with each patient. Basic demographic details for all patients will be collected primarily. The study methodology comprised an audit to assess the quality of care provided to the diabetic patients using the quality indicators for diabetes care. The process indicators consist of basic tests that are required to be done in a patient with diabetes. The proximal outcome measures laid down criteria for HB1Ac, blood pressure (BP), lipid profile, foot examination in the context of evaluating the quality of care.

## RESULTS

In our study, 50 patients with type 2 diabetes were questioned and assessed for quality indicators. Figure 1 shows the distribution of study patients in gender. This shows that males 64% are more in our study group than females 36%.

Seventy-eight percent of patients in our study are aged between 30 and 60 years, and 22% of patients are more than 61 years. Forty-two percent of patients are in 51-60 years age group followed by 41-50 years (Figure 2).

Twenty percent of study patients have one or more person in family with diabetes. In our study, 50% of patients are doing clerical jobs such as accounts, salespeople, small-scale business, driving, and 14% are doing agriculture such as farming in their own land or working in farming-associated jobs. Thirty-two percent of patients are unemployed; most of them are females. Addiction, smoking, and alcohol play an important role in causing unwanted health problems and change in sugar level in blood. Eighteen percent of male patients were smoking cigarettes and 16% were drinking

alcohol. Fifty-four percent of patients are adherent to the treatment, and 46% are not adherent to the treatment. Fifty-seven percent of oral treatment patients are not taking medicine in correct time or missing the dose. Thirty-seven percent of patients in insulin therapy are non-adherent (Figure 3).

More than 50% of patients are not in regular in routine checkup, and 52% of patients are not monitoring the blood sugar level. Seventy percent of patients are not monitoring the glycated hemoglobin (HbA1c) value once in 6 months; it is more important to know the glycemic control of every 6 months that it may help in controlling the blood sugar. Seventy-eight percent of patients are not checking their foot regularly to prevent foot ulcer. In our study, 90% are not checking their eye to prevent diabetic retinopathy; more than 5 years of diabetes patients must check their eye every 6 months as per the study. Seventy-two percent of patients are felt hypoglycemic effect <1 in a week (Figure 4).

When comparing the knowledge of patients in gender, both genders have no difference in awareness of diabetes. There is difference understanding diabetes in patients went to school and colleges; patients went to school have good awareness of diabetes than patients went to colleges. Occupation of the patients does not have any role in awareness of diabetes (Table 1).

When comparing the quality indicators in relation to knowledge of the patients, BP of the patients in poor knowledge group had shown high BP level (103.92 map) when compared with patients in good knowledge (101.63 map) ( $P = 0.344$ ). Random blood sugar levels of poor knowledge patients were normal (110.83 mg/dl) when compared with good knowledge patients (130.52 mg/dl) which is abnormal. Shockingly, patients with good knowledge are not controlling their blood sugar level ( $P = 0.006$ ). When talking about HbA1c, there is no difference in HbA1c level in respect to knowledge of the patients; hence, all patients have no difference in HbA1c level. Low-density lipoprotein level also has shown no difference in knowledge group (Table 2).

## DISCUSSION

India is leading global diabetes epidemic; 50% of diabetes patients are living in three countries, China, India, followed by the United States.<sup>7</sup> This is evidence that diabetes is increasing in Indian Urban area. The conventional risk factors of urbanization, unhealthy eating habits and physical inactivity, coupled with inherent genetic attributes and differences in body composition, are propelling the increase in cases of diabetes. Accordingly, diabetes-related

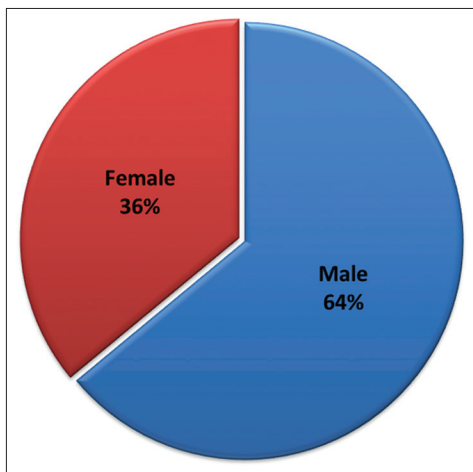
**Table 1: Association of variables in knowledge in essential concepts in diabetes**

Parameters	Category	Knowledge in essential concepts in diabetes						P
		Good %		Average %		Poor %		
Age groups (years)	30-60	20	40	10	20	9	18	0.323
	>61	3	6	5	10	3	6	
Gender	Male	17	34	9	18	6	12	0.349
	Female	6	12	6	12	6	12	
Education	School	20	40	15	30	7	14	0.012
	College	3	6	0	0	5	10	
Occupation	Agriculture	1	2	4	8	2	4	0.165
	Clerical	16	32	5	10	4	8	
	Professional	1	2	0	0	1	2	
	Unemployed	5	10	6	12	5	10	
Diabetes duration (years)	<5	5	10	2	4	1	2	0.504
	5-10	7	14	5	10	7	14	
	>10	11	22	8	16	4	8	

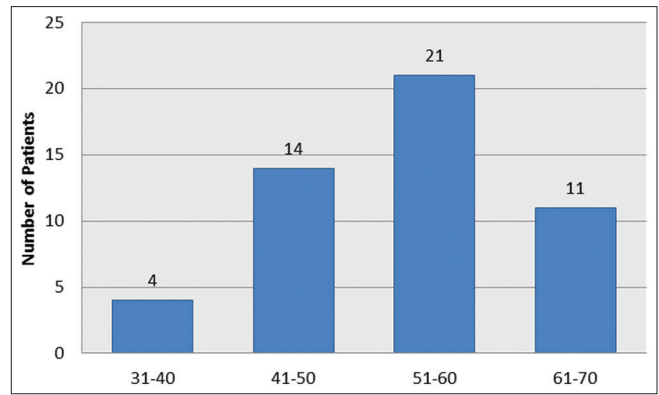
**Table 2: Association of knowledge scores with outcome indicators**

Quality indicators	Knowledge	Mean	SD	Minimum	Maximum	P
BP	Poor	103.92	1.88	100	106	0.344
	Average	102.73	4.28	93	106	
	Good	101.65	5.20	93	108	
RBS	Poor	110.83	11.10	98	138	0.006
	Average	132.80	22.61	96	172	
	Good	130.52	18.61	96	160	
HbA1c	Poor	7.30	0.70	6.4	8.6	0.078
	Average	8.04	0.81	6.8	9.6	
	Good	7.83	0.93	6.5	9.2	
LDL	Poor	125.17	11.98	98	146	0.363
	Average	132.07	18.56	98	165	
	Good	133.52	17.26	98	180	

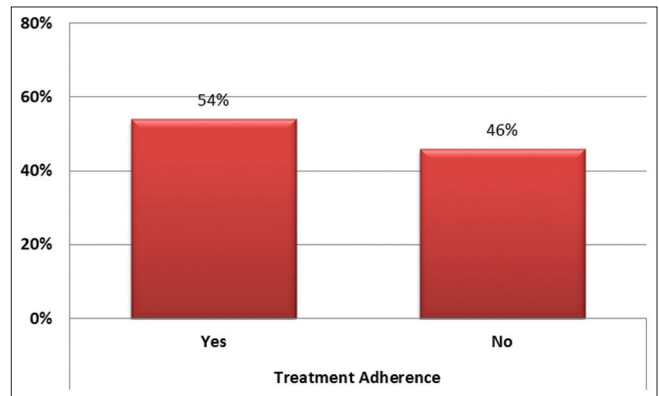
SD: Standard deviation, BP: Blood pressure, RBS: Random blood sugar, LDL: Low-density lipoprotein, HbA1c: Glycated hemoglobin



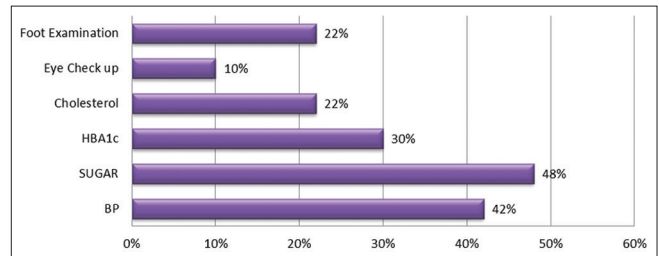
**Figure 1: Distribution of gender included in study**



**Figure 2: Distribution of patients in age group**



**Figure 3: Distribution of treatment adherence of study patients**



**Figure 4: Distribution of study patients underwent self-check up**

complications are also on the rise and contribute significantly to overall morbidity and mortality.<sup>8</sup> The low levels of education and poor awareness of the disease in the country are enhancing its impact on health of the population. While comprehensive data are not available, smaller studies have been performed in various states of India to study the prevalence of diabetes. Based on these studies, the highest prevalence reported is from Ernakulam in Kerala (19.5%) and the lowest from Kashmir Valley (6.1%). Most other areas have prevalence above 10%. While most prevalence studies in India have been regional, there has been a recent effort supported by the Indian Council of Medical Research (ICMR) to estimate the nationwide prevalence of diabetes (urban and rural). The first phase

of the ICMR-India study (involving three states and one union territory) has been completed. In this study, around 13,000 subjects were studied using a stratified multistage sampling design. The rural and urban population was equally represented. The prevalence rates of diabetes and pre-diabetes were assessed by measurement of fasting and 2 h post-glucose load capillary blood glucose. This study projects a likely national estimate of 62.4 million patients with diabetes and 77.2 million with pre-diabetes. Prevalence of diabetes was reported ranging from 5.3% to 13.6% in different areas in this study.<sup>9</sup> There is limited information on the incidence of diabetes in India. One such data source is the New Delhi Birth Cohort study, which reported an annual incidence of 1.0% for males and 0.5% for females, even though this population was in the fourth decade of life. In a longitudinal cohort from Chennai, the incidence of diabetes was calculated as 20.2 per 1000 person-years among subjects with prior normal glucose tolerance and 64.8 per 1000 person-years in those with pre-diabetes.<sup>10</sup>

## CONCLUSION

This study helps to health-care providers to know the quality of health of diabetes patients. This may reconsider their policy to achieve the management goals of a good quality care provided to the diabetes patients. Regular monitoring of diabetes patients is more important in achieving the goals. Hence, health-care provider must create local standards of care and clinical practice guidelines for the management of diabetes that are easily affordable and available. Patients must be alerted by awareness program

to increase the frequency of visiting health-care providers to monitor their health.

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