



(RESEARCH ARTICLE)



Awareness of Diabetes Mellitus: A cross sectional study

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Abstract

Introduction: Diabetes Mellitus is a silent killer disease. More efforts have been devoted to educate the public about diabetes. Nevertheless, the effect of such efforts has however to be properly appraised. It is important to identify areas of knowledge that might require additional educational efforts.

Methodology: A cross-sectional study was conducted to evaluate the general public's knowledge of diabetes. The respondents were required to answer 45 questions from a pre-tested questionnaire divided into five main sections, namely, general knowledge, risk factors, symptoms and complications, treatment, and management, and monitoring. One score was awarded for correct responses and zero score was given for wrong or unsure responses. The maximum score was 41. Data was collected from a total of 330 subjects.

Results and Discussion: It was found that the samples had highest score, 83.3% in diabetic monitoring and lowest score, 62.3% in diabetic risk factors. The mean score obtained by the respondents was 66.1% of the maximum possible total scores (i.e. 27.1 points out of 41). The "correct answer" percentages for the individual questions from each section ranges from 20.1 to 81.3% (General knowledge), 29.4 to 88.8% (Risk factors), 45.8 to 79.5% (Symptoms and complications), 32.8 to 84.7% (Treatment and management), and 55.8 to 91.1% (Monitoring).

Conclusion: The public as represented by the samples in this study is generally well informed about diabetes except for a few areas. Investigation of these areas would have a noteworthy allegation for future public education programme. Health care professionals should be more active in publicizing health information about diabetes.

Keywords: Diabetes Mellitus; Knowledge; Risk Factors; Symptoms; Complications; Treatment; Management; Monitoring

1. Introduction

Diabetes Mellitus (DM) is a chronic disease that occurs either when the pancreas does not produce enough insulin or when the body cannot effectively use the insulin it produces¹. The word diabetes is a Greek word meaning a siphon i.e., a tap. As patients with diabetes have polyuria and passes urine like a siphon, the 2nd century AD Greek physician, Aretus named the condition so. Diabetes was previously known as the disease of rich. But now there is no partiality between rich and poor. The chronic diabetic complications are macro-vascular diseases, (coronary artery, cerebrovascular and peripheral vascular diseases), micro vascular complications (kidney and eye diseases) and neuropathic complications (diseases of the nerves)².

In 2019, diabetes was the direct cause of 1.5 million deaths and 48% of all deaths due to diabetes occurred before the age of 70 years. Around 460 000 kidney disease deaths were caused by diabetes. Raised blood glucose causes around

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20% of cardiovascular deaths. Between 2000 and 2019, there was a 3% rise in age-standardized death rates due to diabetes. In lower-middle-income countries, the death rate from diabetes increased to 13%. Whereas, the probability of dying from any one of the four main non-communicable diseases (cardiovascular diseases, cancer, chronic respiratory diseases or diabetes) in the age between 30 and 70 years decreased by 22% globally between 2000 and 2019¹.

India is the 'Diabetic capital of world'. A close link exists between DM and cardiovascular disease (CVD), which is the most prevalent cause of morbidity and mortality in diabetic patients³. Diabetes-related complications such as cardiovascular diseases, kidney diseases, neuropathies, blindness, and lower-extremity amputations are a substantial reason for high disease and death rates among diabetics, and ends in a heavy financial problem on the US health care system⁴. In pregnancy, poorly controlled diabetes increases the risk of foetal death and other complications⁵. In the United States, the total cost of diagnosed diabetes in 2017 was \$327 billion. This included \$237 billion for direct medical costs⁶.

Knowledge of diabetes mellitus can assist in early detection of the disease and reduce the incidence of complications. Thus, considerable efforts had been put in to inform the public about diabetes. Although much effort has been devoted to educating the public about diabetes through various forms of media, the impact of such efforts has yet to be officially evaluated. It is not known how much the public actually knows about diabetes through the current programmes. An understanding of the level of public awareness is helpful for health educators to plan for future programmes. However, a literature search retrieved no article on the level of diabetes knowledge in the general population. Efforts in this area were directed towards measuring patients' knowledge.

This paper discusses the results of a cross-sectional study conducted to evaluate the general public's knowledge of diabetes mellitus. The main objective identifies areas of weakness and misconception that might require additional educational efforts. The results of the study would allow improvements of the current programmes to address areas of knowledge deficiency and misconceptions, thus achieving maximum efficiencies with the finite resources devoted to public education.

1.1. Statement of the problem

A cross-sectional study to assess the awareness on diabetes mellitus among people residing at a selected village, Kanyakumari district.

Objectives

To assess the public awareness on diabetes mellitus.

2. Methodology

A cross-sectional study was conducted to accomplish the objective of the study. The inclusion criteria were that subjects must be greater than 16 years of age and they must understand the instructions of the tool. Subjects were selected randomly by tossing a coin. The data was collected using pre-tested questionnaire with two parts, Part I has socio-demographic variables and Part II has a total of 41 questions with 'Yes', 'No' or 'Unsure' about the response. The questionnaire was in Tamil language. The tool was developed by the researcher after reviewing relevant literature and it was divided into five main sections, with each section focusing on different aspects of diabetes mellitus, namely, general knowledge about diabetes (9 questions), risk factors (4 questions), symptoms and complications (11 questions), treatment and management (13 questions), and monitoring (4 questions). One score was awarded for each correct response and zero for wrong or unsure responses. The maximum total score for sections one to five was 41. The data was collected after obtaining consent from the samples using the pretested questionnaire.

3. Results and discussion

Table 1 Socio-demographic variables

n = 330

S. No.	Characteristics	Frequency (N)	Percentage (%)
1.	Age		
	19 – 25 years	177	53.7
	26 – 35 years	49	14.8
	36 – 45 years	49	14.8
	46 – 55 years	36	10.9
	More than 55 years	19	5.8
2.	Gender		
	Male	151	45.8
	Female	179	54.2
3.	Income		
	No income	136	41.2
	< Rs. 5000	37	11.2
	Rs. 5000 – 25000	108	32.7
	Rs. 25001 – 50000	30	9.1
	> Rs. 50000	19	5.8
4.	Educational level		
	None	11	3.3
	Primary	28	8.6
	Secondary	117	35.4
	Degree	167	50.6
	Others	7	2.1
5.	Source of information		
	Friends and relatives	37	11.2
	Books, magazines and/or journals	56	17
	Health professionals	115	34.8
	Internet and World Wide Web	122	37

Data were collected from a total of 342 subjects. 12 subjects were omitted from the analysis due to incomplete and poor-quality data. Of the 330 samples, 53.7% were in the age group of 19 -25 years, 54.2% were females, 41.2% had no income and 50.6% had an education level of degree. It was found that most of the respondents has obtained information through the Internet and World Wide Web. Over the last decade, the use of the Internet has been increasing steadily. Given the large amount of medical information available on the Internet, it was surprising that the Internet was the least exploited source of information. This trend however might change as information technologies continue to grow exponentially. Based on overseas trends, the use of the Internet for medical information is expected to become more popular. Internet access is widely available in all tertiary institutions.

Awareness on diabetes mellitus**Table 2** Maximum possible score, mean, and standard deviation for each section

n = 330

S. No.	Section	Maximum possible score	Mean	Standard deviation
1.	General knowledge	9	56.4	2.31
2.	Risk factors	4	62.3	1.16
3.	Symptoms and complications	11	66.6	3.12
4.	Treatment and management	13	68.2	3.04
5.	Monitoring	4	83.3	0.86

It was found that the samples had the highest score, 83.3% in diabetic monitoring and the lowest score, 62.3% in diabetic risk factors.

Table 3 General knowledge on diabetes mellitus

n = 330

S. No.	Item	Correct %	Wrong %	Unsure %
1.	Is diabetes a condition of increased blood sugar?	81.3	6.5	12.2
2.	Is diabetes a condition of lack of insulin?	58.5	8.9	32.6
3.	Is diabetes a condition of the body not responding to insulin?	30.4	25.1	44.5
4.	Is diabetes contagious?	70.7	10.6	18.7
5.	How many types of diabetes are there?	20.1	13.9	66
6.	Is diabetes curable?	52	26.7	21.3
7.	Is insulin a hormone?	38.4	22.8	38.8
8.	Does insulin control blood sugar?	72.2	3.5	24.3
9.	Is insulin required for some diabetic patients?	66	6	28

Table 3 showed that majority of the subjects did not know that there are different types of diabetes. The absence of experience in diabetic patients and the absence of curiosity in issues unrelated to them may be the reasons for the low scores. The respondent's poor knowledge of the pathophysiology of diabetes showed up again in the other questions. Only one-third knew that diabetes could also be due to the body not responding to insulin. As high as one-fourth of the respondents thought that diabetes is curable. This misunderstanding may make the general public to be less cautious in taking preventive measures for diabetes. It is needed to highlight the social and economic influence of diabetes in future educational programs so that the public would have a better understanding of the magnitude of the disease.

Table 4 Knowledge on risk factors of diabetes

n = 330

S. No.	Item	Correct %	Wrong %	Unsure %
1.	Do you have family history of diabetes?	88.8	4.1	7.1
2.	Are you above 40 years of age?	57.6	20.9	21.5
3.	Are you obese?	65.7	14.8	19.5
4.	Are you pregnant?	29.4	37.3	33.3

This is the section where the respondents recorded the lowest scores, indicating that more effort should be put into educating the public about risk factors. A sedentary lifestyle and obesity are two important contributors to the increasing prevalence of diabetes. By educating individuals about their level of risk, it is hoped that high-risk individuals would be motivated to adopt a healthy lifestyle, undergo routine medical check-ups, and be active players in the

prevention of diabetes. The US Preventive Services Task Force recommends screening for prediabetes and type 2 diabetes in adults aged 35 to 70 years who have overweight or obesity. Clinicians should offer or refer patients with prediabetes to effective preventive interventions⁷. For those with low or intermediate estimated risk, risk-factor screenings are recommended at 5-year intervals; this interval is based on expert opinion rather than on direct research evidence⁸. The author urges the healthcare authorities to look into the feasibility of implementing routine screening of high-risk individuals as an important preventive measure.

Table 5 Knowledge on symptoms and complications of diabetes

n = 330

S. No.	Item	Correct %	Wrong %	Unsure %
	Symptoms			
1.	Are you having constant feeling of thirst?	65.3	8.3	26.4
2.	Are you having frequent urination?	59.8	11.4	28.8
3.	Are you having weight loss despite normal appetite?	59.2	13.5	27.3
4.	Are you having blurred vision?	55.5	13	31.5
5.	Are you having slow healing of cuts and wounds?	72.6	9.5	17.9
6.	Are you having tiredness and weakness?	79.5	4	16.5
	Complications			
1.	Are you having decaying limbs that require surgical removal?	71.6	9.2	19.2
2.	Are you having eye problems?	67.6	10.3	22.1
3.	Are you having kidney problems?	68.3	8.7	23
4.	Are you having blood pressure?	66.7	9.3	24
5.	Are you having loss of sensation in arms and legs?	45.8	14.6	39.6

The results showed that the samples had a good understanding of the symptoms and complications of diabetes. Early recognition of symptoms may aid in early detection of the disease, allowing for prompt treatment. The onset of Type 2 diabetes, the predominant form, is usually insidious. Many Type 2 diabetes patients were undiagnosed until they developed severe complications. At the same time, with knowledge of the severity of complications, the public would not take the symptoms lightly and would seek prompt medical attention. The symptoms of Type 2 diabetes are so mild that patients who are fortunate to be diagnosed early do not see a need for long-term therapy. Effective health education consequently improves knowledge, attitude, and practices (KAP) leading to better glycaemic control, and is widely accepted as an integral part of comprehensive diabetes care for affected individuals and their families in primary care settings.⁹

The respondents did very well in this section. Given that Type 2 diabetes is the more common form of diabetes, it is interesting to find that more people knew about insulin than oral hypoglycaemic agents. The concomitant use of insulin and oral hypoglycaemic agents in many Type 2 diabetics may account for this. One point of contention is that the percentage of the population who knew about insulin injection was even higher than those who knew that the lack of insulin is a cause of diabetes. This could be due to the repetitive use of “insulin” in the earlier section of the questionnaire, giving them a preconceived idea of its use in treatment.

In terms of knowledge about preventing complications of diabetes, few people knew diabetics should carry sweets and jelly beans for hypoglycaemic episodes, and the need for regular eye check-ups and proper foot care. This is congruent with the information obtained from the previous sections.

Table 6 Knowledge on treatment and management of diabetes

n = 330

S. No.	Item	Correct %	Wrong %	Unsure %
	Medications availability			
1.	Are insulin injections available for the control of diabetes?	83.4	2.4	14.2
2.	Are tablets and capsules available for the control of diabetes?	71	7.4	21.6
	Lifestyle and non-medical measures			
1.	Should diabetics carry sweets and jelly beans when they are out?	32.8	45.9	21.3
2.	Should diabetics exercise regularly?	84.7	4.1	11.2
3.	Should diabetics have good weight control?	83.8	3.5	12.7
4.	Should diabetics go for regular eye check-up?	57	13.8	29.2
5.	Should diabetics have a low fat and high fibre diet?	79.4	4	16.6
6.	Should diabetics care for their toes and feet?	50.6	18.7	30.7
	Things diabetics should not do			
1.	Can diabetics consume alcohol?	78.4	6.3	15.3
2.	Can diabetics donate blood?	58	16.8	25.2
3.	Can diabetics smoke?	75.1	8.4	16.5
4.	Can diabetics wear tight shoes?	44.3	21.9	33.8
5.	Can diabetics skip meals when busy?	62.3	15.3	22.4

It is encouraging to find that many respondents knew diabetics should not donate blood. It is unclear, however, if they know the reason behind it. It may be necessary to clarify that the real reason for discouraging blood donation is due to the danger of slow wound healing which increases the risk of infection in the diabetic patient. Otherwise, people might have the misconception that diabetes could be transmitted through blood products. But if healthy and diabetes is under control blood can be donated.¹⁰

Table 7 Knowledge of monitoring of diabetic conditions

n = 330

S. No.	Item	Correct %	Wrong %	Unsure %
1.	Should diabetics test for blood glucose?	89.9	2.2	7.9
2.	Should diabetics test for sugar in the urine?	88.3	4.6	7.1
3.	Should diabetics make regular visits to the eye doctor?	55.8	14.4	29.8
4.	Should diabetics go for regular medical check-ups?	91.1	2.8	6.1

The respondents performed best in this section. However, there is still a major area of concern about eye care. Once again, it was shown that the respondents did not know about the need for regular eye check-ups. This reveals the internal consistency of the responses.

4. Conclusion

The results of this study showed that the public as represented by the samples in this study is generally well informed about diabetes except for a few areas as mentioned. Therefore, it can be concluded that public education about diabetes had been reasonably successful in terms of passing on knowledge. However, it is not sure how strongly public education had encouraged people to adopt a different lifestyle to reduce their risk of developing diabetes. Future studies could look into this aspect. It is believed that the Internet will become an important source of healthcare information. The results of this study could contribute positively and meaningfully to the design of future educational programmes and

materials. Good educational programmes that challenge the areas of weaknesses or misconceptions can improve the level of public awareness of diabetes.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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