Research Paper

A Study to Assess the Knowledge Regarding Warning Signs of Diabetes Mellitus among Adults at Selected Rural Area, Puducherry

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ABSTRACT:
Diabetes 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 produces. Insulin is a hormone that regulates blood glucose. The main objective of the study to assess the level of knowledge regarding warning signs of Diabetes Mellitus among adults. The research approach used for this study was quantitative research approach. A descriptive design was adopted for this present study. By using convenient sampling technique, 50 adults were selected for the present study. The present study reveals that majority 30 (60%) of them had moderate knowledge, 20 (40%) of them had inadequate knowledge. The study findings concluded that there is significance association between age, education status and occupational status level of knowledge regarding warning signs of Diabetes Mellitus among adults where p<0.05.
Keywords: *Diabetes mellitus, Knowledge, Warning signs*

I.   INTRODUCTION:

Diabetes 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 produces. Insulin is a hormone that regulates blood glucose. Hyperglycaemia, also called raised blood glucose or raised blood sugar, is a common effect of uncontrolled diabetes and over time leads to serious damage to many of the body's systems, especially the nerves and blood vessels.

Diabetes mellitus is a group of metabolic diseases whose common feature is an increase in the blood glucose level. It is one of the most common diseases, causing significant mortality and morbidity worldwide. The development of complications in diabetes is not related to hyperglycaemia alone. Studies suggest that the genesis of complications is related not only to glycaemic control but also to blood pressure and lipid control.

The major types of diabetes are type 1 and type 2, though other forms also exist. The most common treatment for type 1 is insulin replacement therapy (insulin injections), while anti-diabetic medications and lifestyle modifications can be used to manage type-2 Gestational diabetes, a form that arises during pregnancy in some women, normally resolves shortly after delivery. The classic symptoms of untreated diabetes are polyuria, thirst, and weight loss. Several other non-specific signs and symptoms may also occur, including fatigue, blurred vision, and genital itchiness due to Candida infection. About half of affected individuals may also be asymptomatic. Type 1 presents abruptly following a pre-clinical phase, while type 2 has a more insidious onset; patients may remain asymptomatic for many years.

Diabetes mellitus is diagnosed with a test for the glucose content in the blood, and is diagnosed by demonstrating any one of the following. Fasting plasma glucose level $\geq$ 7.0 mmol/L (126 mg/dL). For this test, blood is taken after a period of fasting, i.e. in the morning before breakfast, after the patient had sufficient time to fast overnight or at least 8 hours before the test. Plasma glucose $\geq$ 11.1 mmol/L (200 mg/dL) two hours after a 75-gram oral glucose load as in a glucose tolerance test (OGTT). Symptoms of high blood sugar and plasma glucose $\geq$ 11.1 mmol/L (200 mg/dL) either while fasting or not fasting Glycated haemoglobin (HbA1C) $\geq$ 48 mmol/mol ($\geq$ 6.5 DCCT %).

A per the WHO, people with fasting glucose levels from 6.1 to 6.9 mmol/L (110 to 125 mg/dL) are considered to have impaired fasting glucose. People with plasma glucose at or above 7.8 mmol/L (140 mg/dL), but not over 11.1 mmol/L (200 mg/dL), two hours after a 75 gram oral glucose load are considered to have impaired glucose tolerance. Of these two prediabetic states, the latter in particular is a major risk factor for

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progression to full-blown diabetes mellitus, as well as cardiovascular disease. The American Diabetes Association (ADA) since 2003 uses a slightly different range for impaired fasting glucose of 5.6 to 6.9 mmol/L (100 to 125 mg/dL).

Diabetic ketoacidosis is a medical emergency that occurs most commonly in type-1, but may also occur in type 2 if it has been longstanding or if the individual has significant β-cell dysfunction. Excessive production of ketone bodies leads to signs and symptoms including nausea, vomiting, abdominal pain, the smell of acetone in the breath, deep breathing known as Kussmaul breathing, and in severe cases decreased level of consciousness.

Hypoglycaemia is a recognised complication of insulin treatment used in diabetes. An acute presentation can include mild symptoms such as sweating, trembling, and palpitations, to more serious effects including impaired cognition, confusion, seizures, coma, and rarely death. Recurrent hypoglycaemic episodes may lower the glycaemic threshold at which symptoms occur, meaning mild symptoms may not appear before cognitive deterioration begins to occur.

The major long-term complications of diabetes relate to damage to blood vessels at both macrovascular and microvascular levels. Diabetes doubles the risk of cardiovascular disease, and about 75% of deaths in people with diabetes are due to coronary artery disease. Other macrovascular morbidities include stroke and peripheral artery disease.

Microvascular disease affects the eyes, kidneys, and nerves. Damage to the retina, known as diabetic retinopathy, is the most common cause of blindness in people of working age. The eyes can also be affected in other ways, including development of cataract and glaucoma. It is recommended that people with diabetes visit an optometrist or ophthalmologist once a year.

Diabetic nephropathy is a major cause of chronic kidney disease, accounting for over 50% of patients on dialysis in the United States. Diabetic neuropathy, damage to nerves, manifests in various ways, including sensory loss, neuropathic pain, and autonomic dysfunction (such as postural hypotension, diarrhoea, and erectile dysfunction). Loss of pain sensation predisposes to trauma that can lead to diabetic foot problems (such as ulceration), the most common cause of non-traumatic lower-limb amputation.

There is no known preventive measure for type 1 diabetes. However, islet autoimmunity and multiple antibodies can be a strong predictor of the onset of type 1 diabetes. Type 2 diabetes—which accounts for 85–90% of all cases worldwide—can often be prevented or delayed by maintaining a normal body weight, engaging in physical activity, and eating a healthy diet. Higher levels of physical activity (more than 90 minutes per day) reduce the risk of diabetes by 28%.

Dietary changes known to be effective in helping to prevent diabetes include maintaining a diet rich in whole grains and fibre, and choosing good fats, such as the polyunsaturated fats found in nuts, vegetable oils, and fish. Limiting sugary beverages and eating less red meat and other sources of saturated fat can also help prevent diabetes. Tobacco smoking is also associated with an increased risk of diabetes and its complications, so smoking cessation can be an important preventive measure as well. Diabetes management concentrates on keeping blood sugar levels close to normal, without causing low blood sugar. This can usually be accomplished with dietary changes, exercise, weight loss, and use of appropriate medications (insulin, oral medications.

NEED FOR THE STUDY

According to **WHO,** in 2014, 8.5% of adults aged 18 years and older had diabetes. 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. Another 460 000 kidney disease deaths were caused by diabetes, and raised blood glucose causes around 20% of cardiovascular deaths

Between 2000 and 2019, there was a 3% increase in age-standardized mortality rates from diabetes. In lower-middle-income countries, the mortality rate due to diabetes increased 13%. The estimated prevalence of DM in adult population of Ethiopia is 1.9% (4, 5). Moreover, another study reported a high prevalence of diabetes (8.9%) among young (age < 30 years) in Ethiopian Jews who have been to Israel for less than 4 years (6). WHO estimated the number of diabetic cases in Ethiopia to be 800,000 by the year 2000, and the number is expected to increase to 1.8 million by 2030.

The **World Health Organization (WHO)** has estimated that in 2030, Malaysia would have a total number of 2.48 million diabetics compared to 0.94 million in 2000 which is a 164%. This rising trend is mainly due to some factors such as growing population, aging, urbanization and increasing prevalence of obesity and physical inactivity among Malaysians.

In India, according to **National Family Health Survey of India (NFHS),** 2019–2021 states that it has been estimated diabetes prevalence to be 16.1% (15.9–16.1%). Among those with diabetes, 27.5% (27.1–27.9%) were aware, 21.5% (21.1–21.7%) were taking treatment and 7% (6.8–7.1%) had their diabetes under control. Across the states of India, the adjusted rates of awareness varied from 14.4% (12.1–16.8%) to 54.4% (40.3–68.4%), of treatment from 9.3% (7.5–11.1%) to 41.2% (39.9–42.6%), and of control from 2.7% (1.6–3.7%) to 11.9% (9.7–14.0%).

In Tamil Nadu, Sanjay Kumar Gupta et al. (2018) conducted a study on Prevalence and its Risk Factors in Rural Area. 1936 respondents comprising 1167 (60.27%) females and 769 (39.73%) males were studied. Majority 1203 (62.50%) were Hindus. 1220 (63%) had studied up to higher secondary. 1200 (62%) belonged to lower and lower-middle socio-economic class. A large number of the subjects 948 (50%) were below 35 years of age. Most of the respondents 1411 (73%) indulged in mild to moderate physical activity. 1715 (87.91%) had no family history of diabetes mellitus. 750 (39.64%) individuals were in the overweight category (>25 BMI). Out of these overweight persons, 64% had high diabetic risk score. It is observed that chances of high diabetic score increase with the increase in BMI. Prevalence of diabetes in studied population was 5.99%; out of these, 56% known cases of diabetes mellitus had high (>60) IDRS.

In Puducherry, Anil J Purty et al. (2018) conducted a study on Prevalence of diagnosed diabetes in an urban area of Puducherry. Among 643 individuals who had been diagnosed with diabetes. The prevalence of known diabetes was estimated to be 5.6% (5.31% in males and 6.1% in females). The age-sex specific prevalence was estimated using the 2001 Census data. There are about 48,876 known diabetics living in Puducherry. (1) Community-based health surveillance data comprise a useful tool to measure the prevalence of diagnosed cases of diabetes mellitus within the Indian context; 2) Diabetes mellitus is an important public health priority requiring urgent preventive action as there are about 97,752 persons in Puducherry who have either been diagnosed with diabetes or remain undiagnosed for the disease.

The investigator during clinical posting in ward most of the adults not aware of the warning signs of diabetes mellitus. This intends the investigator to conduct the study to assess the knowledge regarding warning signs of Diabetes Mellitus among adults at selected rural area, Puducherry.

STATEMENT OF THE PROBLEM
A study to assess the knowledge regarding warning signs of diabetes mellitus among adults at selected rural area, Puducherry

OBJECTIVES OF THE STUDY
- To assess the level of knowledge regarding warning signs of Diabetes Mellitus among adults.
- To associate the level of knowledge regarding warning signs of Diabetes Mellitus among adults with their selected demographic variables.

II.   RESEARCH METHODOLOGY:
A quantitative research approach and descriptive design was selected for the present study. The present study was on 50 adults who are residing in Vinayagampattu, Puducherry who meet the inclusion criteria. Using a convenient sampling technique the samples were selected for the present study. The tool consists of demographic variables and structured questionnaires. The data of the study was evaluated by using descriptive and inferential statistics.

MAJOR FINDING
Regarding the age in years, the majority 18 (36%) were in the age group of 30-40 years, 14(28%) were in the age group of 18-30 years and 12 (24%) were in the age group of 40-60 years. With regards to gender, majority 36 (72%) were female and 14 (28%) were male. In the aspect of religion majority, 42 (84%) were Hindu, 5 (10%) were Muslim and 2 (4%) were Christian. In the aspect of education status, the data shows majority 22 (44%) were diploma and 12 (24%) were Illiterate. In the aspect of occupation status majority, 23 (46%) were doing agriculture, 17 (34%) were working in private and 10 (20%) were unemployment. Regarding income per month, the data shows that the majority 20 (40%) come under Rs.10001 to Rs.20000 and 17 (34%) were come under Rs. 5001/- to Rs10000/-. With regards to marital status majority, 33 (66%) were married and 17 (34%) were unmarried. In the aspect of type of family, 28 (56%) were in nuclear family and 22 (44%) were joint family. With regards to number of children majority 21 (42%) had two children, 6 (12%) had once children and 8 (16%) had three or more than three children.

III.   RESULTS AND DISCUSSION
The study was conducted study to assess the knowledge regarding warning signs of Diabetes Mellitus among adults at selected rural area, Puducherry. The table 1 reveals the distribution of the level of knowledge regarding warning signs of Diabetes Mellitus among adults. The finding shows that majority 30 (60%) of them had moderate knowledge, 20 (40%) of them had inadequate knowledge.

The table 2 shows that the association of the level of knowledge regarding warning signs of Diabetes Mellitus among adults with their selected demographic variables. There is significance association between age, education status and occupational status level of knowledge regarding warning signs of Diabetes Mellitus among adults where $p<0.05$. There is no significance association between gender, religion, Family Income per month,

marital status, dietary pattern, type of family and number of children with level of knowledge regarding warning signs of Diabetes Mellitus among adults.

Table 1: Distribution of the level of knowledge regarding warning signs of Diabetes Mellitus among adults
N=50

S.NO	LEVEL OF KNOWLEDGE	FREQUENCY (n)	PERCENTAGE %
1.	Inadequate	20	40%
2.	Moderate	30	60%
3.	Adequate	0	0%

Figure 1: Percentage wise distribution of the level of knowledge regarding warning signs of Diabetes Mellitus among adults.

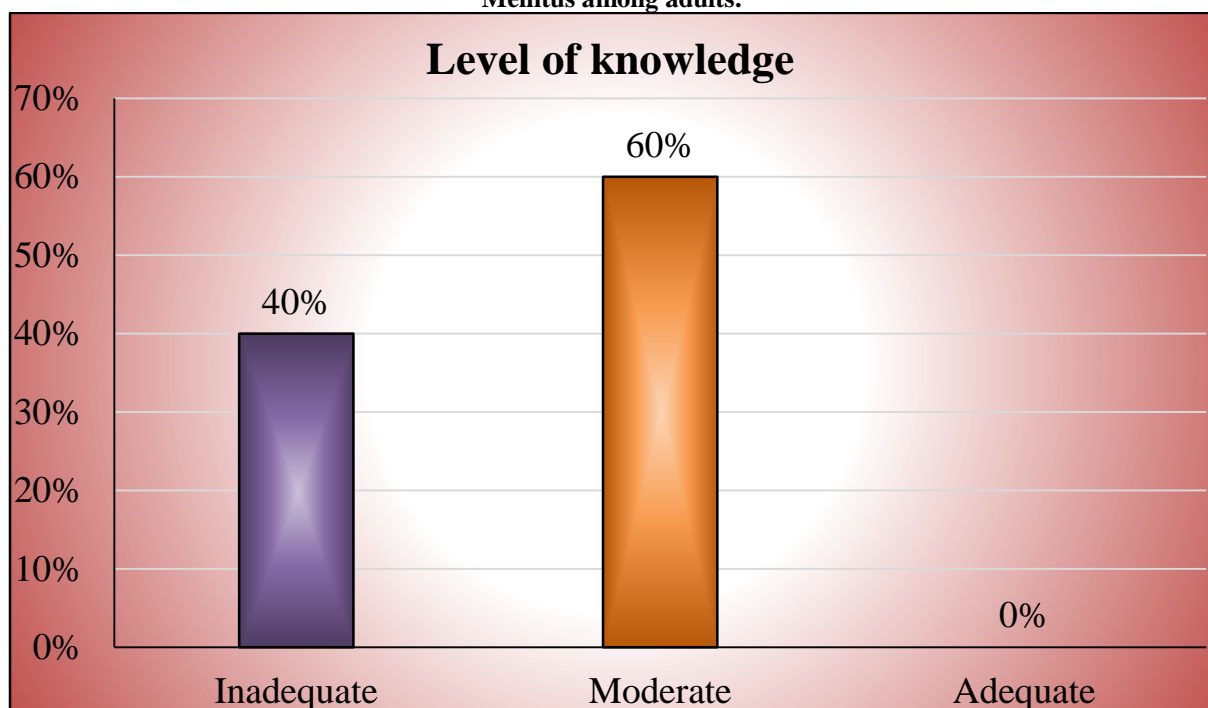**Table 2: Association of the level of knowledge regarding warning signs of Diabetes Mellitus among adults with their selected demographic variables   N=50**

S.No	Demographic variables	Inadequate		Moderate		Adequate		X^2 value
		N	%	N	%	N	%	
1	Age in years							$X^2 = 8.581$ P= 0.035 **(S)***
	a) 18- 30 years	10	20	4	8	0	0	
	b) 30- 40 years	6	12	12	24	0	0	
	c) 40 – 60 years	3	6	9	18	0	0	
	d) Above 60 years	1	2	5	10	0	0	
2.	Gender							$X^2 = 2.794$ p = 0.95 (NS)
	a) Male	3	6	11	22	0	0	
	b) Female	17	34	19	38	0	0	
3.	Religion							$X^2 = 2.143$ p = 0.543 (NS)
	a) Hindu	18	36	24	48	0	0	
	b) Muslim	2	4	3	6	0	0	
	c) Chirstian	0	0	2	4	0	0	
	d) Others	0	0	1	2	0	0	

4.	**Educational status**							
	a) Graduate	0	0	7	14	0	0	$X^2 = 39.541$ p = 0.000 (S)*
	b) Intermediate / Diploma	1	2	21	42	0	0	
	c) School	7	14	2	4	0	0	
	d) Illiterate	12	24	0	0	0	0	
5.	**Occupational Status**							
	a) Government	0	0	0	0	0	0	$X^2 = 30.859$ p = 0.000 (S)*
	b) Private	6	12	11	22	17	34	
	c) Agriculture	9	18	14	28	23	46	
	d) Unemployment	5	10	5	10	10	20	
6.	**Marital Status**							
	a) Married	13	26	20	40	0	0	$X^2 = 0.15$ p = 0.903 (NS)
	b) Unmarried	7	14	10	20	0	0	
	c) Widow	0	0	0	0	0	0	
	d) Divorced	0	0	0	0	0	0	
7.	**Family income per month**							
	a) Rs. 20001 & above	4	8	9	18	0	0	$X^2 = 1.452$ p = 0.484 (NS)
	b) Rs.10001 – 20000	10	20	10	20	0	0	
	c) Rs. 5001 – 10,000	6	12	11	22	0	0	
	d) Less than Rs. 5000/-	0	0	0	0	0	0	
8.	**Dietary pattern**							
	a) Vegetarian	2	4	6	12	0	0	$X^2 = 0.893$ p = 0.345 (NS)
	b) Non – Vegetarian	18	36	24	48	0	0	
9.	**Type of family**							
	a) Nuclear	12	24	16	32	0	0	$X^2 = 0.216$ p = 0.642 (NS)
	b) Joint	8	16	14	28	0	0	
	c) Extended	0	0	0	0	0	0	
10.	**Occupation**							
	a) 1	2	4	4	8	0	0	$X^2 = 2.108$ p = 0.550 (NS)
	b) 2	8	16	13	26	0	0	
	c) 3 and above	5	10	3	6	0	0	
	d) None	5	10	10	20	0	0	

*p<0.05 - Significant; p<0.01 - Highly Significant K= constant

IV.   CONCLUSION:

The present study assessed the knowledge regarding warning signs of Diabetes Mellitus among adults at selected rural area, Puducherry. The study findings concluded that there is significance association between age, education status and occupational status level of knowledge regarding warning signs of Diabetes Mellitus among adults where p<0.05.

V.   RECOMMENDATIONS:

- Same study can be conducted with large samples.
- Same study can be conducted in hospital settings.

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