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Original Article

Assessment of Knowledge and Prevention of Complications among Diabetic Patients

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Abstract

Background: Diabetes mellitus is one of the most prevalent chronic diseases worldwide, associated with serious long-term complications affecting multiple organ systems. Knowledge and preventive practices play a crucial role in minimizing complications and improving patients' quality of life.

Aim: To assess the knowledge and prevention practices regarding complications of diabetes among diabetic patients before and after a Structured Teaching Programme (STP).

Methodology: A quasi-experimental, non-equivalent control group design was used among 30 adult diabetic patients in a selected hospital in Jaipur. Data were collected using a structured questionnaire on socio-demographic variables and a 16-item knowledge and prevention checklist.

Results: The mean pre-test knowledge score was 6.8, which improved to 12.4 in the post-test after implementation of the STP, indicating a significant increase ($p<0.001$). The study also revealed a positive association between knowledge level and demographic variables such as education and duration of diabetes.

Conclusion: The Structured Teaching Programme was effective in improving diabetic patients' knowledge and prevention practices regarding complications.

Keywords: Diabetes Mellitus, Knowledge, Prevention, Complications, Structured Teaching Programme, Patient Education

Introduction

Cerebral edema (CE) is the most severe complication of diabetic ketoacidosis (DKA) in children. There is no accurate knowledge of CE pathogenesis and its onset has been related to intravenous rehydration therapy during the initial treatment.[1]

Cerebral edema is the most frequent serious complication of diabetic ketoacidosis in children, occurring in 1% to 5% of DKA episodes. The rates of mortality and permanent neurologic morbidity from this complication are high. The pathophysiologic mechanisms underlying DKA-related cerebral edema are unclear. A number of past and more recent studies have investigated biochemical and therapeutic risk factors for the development of cerebral edema. This and other information suggests that the pathophysiology of DKA-related cerebral edema may involve cerebral ischemia.[2]

The most common of these is diabetic ketoacidosis (DKA), while cerebral edema is the most dangerous. In

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children with DKA, cerebral edema most often presents with clinical symptoms but may also appear in the so-called "subclinical" form. This manuscript provides an overview of research results available in PubMed and other available databases on the course of treatment of DKA in children with type 1 diabetes.[3]

The study was conducted by measuring ONSD ultrasonographically at baseline and during the course of therapy in patients with DKA. All participants were diagnosed and received therapy at our unit between May 2016 and June 2017. During treatment of children with DKA, it is possible to predict cerebral edema by measuring ONSD, and this may contribute to clinical management, especially fluid treatment.[4]

Medium-Chain Acyl-CoA Dehydrogenase Deficiency (MCADD) is the most common inherited metabolic disorder of β-oxidation. Patients with MCADD present with hypoketotic hypoglycemia, which may quickly progress to lethargy, coma, and death. Prognosis for MCADD patients is highly promising once a diagnosis has been established, though management strategies may vary depending on the severity of illness and the presence of comorbidities.[5]

A complicated interplay where each illness might worsen the other is highlighted by the well-documented bidirectional link between diabetes mellitus and periodontal disease in scholarly literature. This cyclical link emphasizes the value of integrated healthcare methods that optimize management tactics to enhance outcomes for individuals with diabetes by addressing both metabolic and dental health.[6]

Periodontal disease (PD) and type 1 diabetes mellitus (T1DM) are two chronic systemic diseases that are strongly connected. Children and adolescents are frequently diagnosed with type 1 diabetes, a chronic metabolic disease that results in hyperglycemia and long-term harm to many organs. This comprises the vascular system, which includes the periodontium, as well as the kidneys, heart, nerves, and eyes. The prevalence, progression, and treatment of diabetes are all impacted by Parkinson's disease (PD), a form of microvascular complication that is regarded as the sixth complication of diabetes.[7]

Approximately 460 million persons between the ages of 20 and 79 worldwide have diabetes mellitus, either diagnosed or undiagnosed, making it a serious health issue. Improved diabetes management and knowledge are desperately needed to lessen the disease's severe effects on health and its epidemiologic spread. Knowledge of the condition, which is impacted by an individual's attitudes about health and illness, has an impact on self-care management.[8]

A previous study of beliefs about health and illness in Zimbabweans with diabetes mellitus indicated limited knowledge about diabetes and the body, affecting self-care and health-care seeking behaviour. The aim of this study was to assess the level of diabetes knowledge in Zimbabwean adults with diabetes mellitus, to determine the main gaps in knowledge and identify the socio-demographic and diabetes-related determinants that predict diabetes awareness and self-care practices.[9]

Diabetes mellitus (DM) has increased globally, with a significant increase noted in African communities. Self-care health-related behavior is determined by beliefs about health and illness which are based on the person?s knowledge of diabetes. The present study aimed to assess patients' diabetes awareness and level of diabetes knowledge in Zimbabwean adults with diabetes attending an outpatient diabetes clinic at a main referral hospital.[10]

Objectives

1. To assess the knowledge and prevention of complications among diabetic patients before the Structured Teaching Programme (STP).
2. To assess the knowledge and prevention of complications among diabetic patients after the STP.
3. To evaluate the effectiveness of the STP.
4. To find the association between knowledge and prevention of complications with selected demographic variables.

Hypothesis

- **H_1:** There will be a significant difference in the mean pre-test and post-test knowledge scores of diabetic patients regarding prevention of complications after administration of STP.
- **H_2:** There will be a significant association between knowledge level and selected demographic variables such as age, education, and duration of diabetes.

Materials & Methods

Research Approach: Quantitative research approach.
Design: Quasi-experimental, non-equivalent control group design.

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Setting: A selected hospital in Jaipur.

Population: Adult patients diagnosed with Type 2 Diabetes Mellitus.

Sample Size: 30 diabetic patients.

Sampling Technique: Purposive sampling.

Tool Used: Structured questionnaire consisting of two parts:

- **Part I:** Socio-demographic data
- **Part II:** Knowledge & prevention of diabetic complications (16 items; max score = 16). **Scoring Interpretation:** 0–5 = Poor, 6–10 = Moderate, 11–16 = Good.

Data Collection Procedure:

Experimental Group: O_1 X O_2

Control Group: O_1 O_2

Data Analysis: Descriptive and inferential statistics (mean, SD, paired t-test, chi-square test).

Results

This section presents the findings of the study "Assessment of Knowledge and Prevention of Complications among Diabetic Patients", conducted among 30 diabetic patients in a selected hospital at Jaipur. Data were analyzed using descriptive and inferential statistics to evaluate the effectiveness of the Structured Teaching Programme (STP).

Table 1: Frequency and Percentage Distribution of Demographic Variables (n = 30)

S. No.	Demographic Variables	Category	Frequency (f)	Percentage (%)
1	**Age (years)**	[illegible]	3	10
		31–45	7	23.3
		46–60	12	40
		61 & above	8	26.7
2	**Gender**	Male	18	60
		Female	12	40
3	**Marital Status**	Single	5	16.7
		Married	20	66.7
		Widowed/Divorced	5	16.6
4	**Education**	No formal education	4	13.3
		Primary	8	26.7
		Secondary	10	33.3
		Graduate & above	8	26.7
5	**Occupation**	Unemployed	6	20
		Daily wage worker	7	23.3
		Private job	8	26.7
		Government employee	4	13.3
		Self-employed	5	16.7
6	**Residence**	Rural	17	56.7
		Urban	13	43.3
7	**Family History of Diabetes**	Yes	19	63.3
		No	11	36.7
8	**Duration of Diabetes**	< 1 year	4	13.3
		1–5 years	14	46.7
		6–10 years	8	26.7
		> 10 years	4	13.3
9	**Type of Diabetes**	Type 1	0	0
		Type 2	30	100
10	**Current Treatment**	Oral medication	12	40
		Insulin	8	26.7
		Both	6	20
		Diet & lifestyle only	4	13.3

Interpretation:

The majority of participants were aged **46–60 years (40%)**, **male (60%)**, **married (66.7%)**, and **residing in rural areas (56.7%)**. Most had **Type 2 Diabetes (100%)**, with **1–5 years duration (46.7%)** and **family history of diabetes (63.3%)**.

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Table 2: Distribution of Knowledge Levels before and after Structured Teaching Programme (n = 30)

Knowledge Level	Pre-Test		Post-Test	
	Frequency (f)	Percentage (%)	Frequency (f)	Percentage (%)
Poor (0–5)	10	33.3	0	0
Moderate (6–10)	15	50	8	26.7
Good (11–16)	5	16.7	22	73.3
Total	**30**	**100**	**30**	**100**

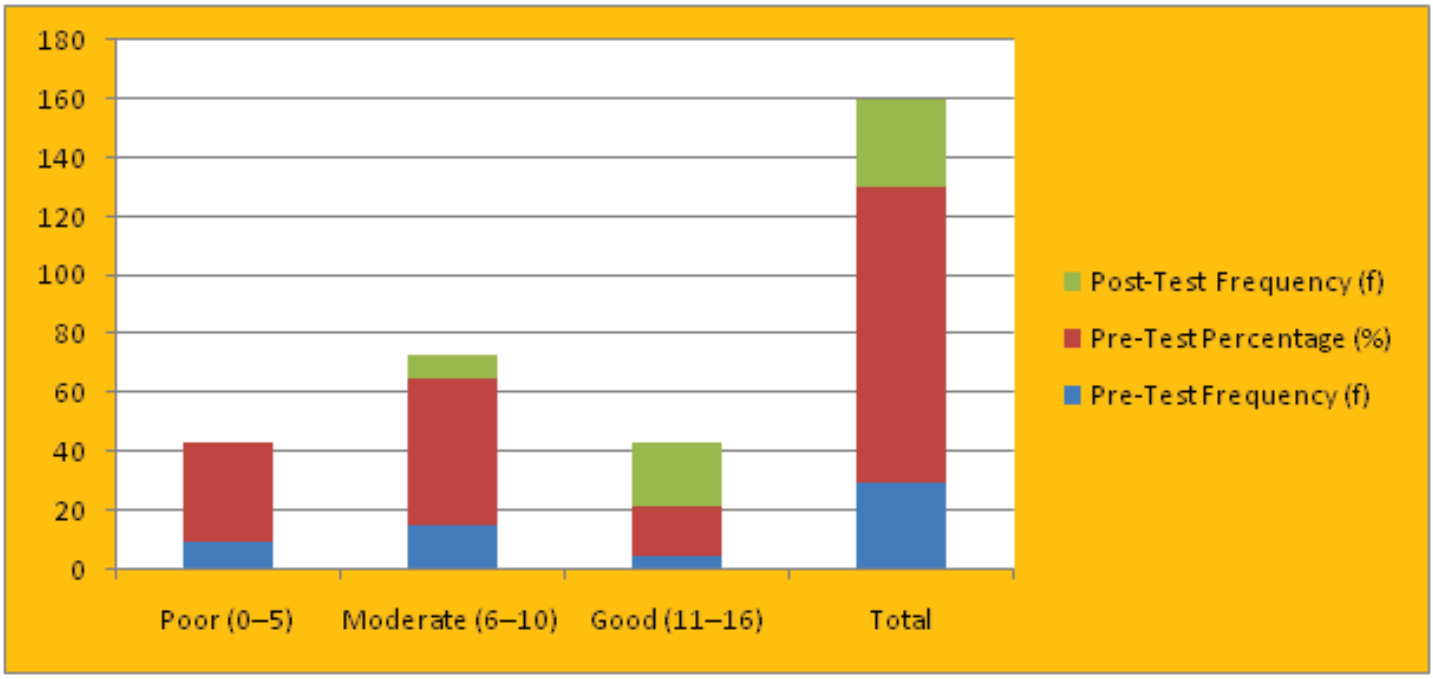

Figure 01: Knowledge Levels before and after Structured Teaching Programme (n = 30)

Interpretation:
Before the STP, **33.3%** of diabetic patients had poor knowledge and only **16.7%** had good knowledge. After the STP, **73.3%** achieved good knowledge, showing a substantial improvement in awareness and preventive practices.

Table 3: Comparison of Pre-test and Post-test Knowledge Scores (n = 30)

Variable	Mean	SD	Mean Difference	t-value	p-value
Pre-Test	6.80	1.90			
Post-Test	12.40	1.80	5.60	10.21	<0.001*

Interpretation:

The **mean knowledge score** increased from **6.8 to 12.4** after the STP, with a **mean difference of 5.6**. The **t-value (10.21)** and **p < 0.001** indicate a statistically significant improvement. Hence, the **Structured Teaching Programme was highly effective**.

Table 4: Association between Knowledge Scores and Selected Demographic Variables (n = 30)

Demographic Variable		df	p-value	Significance
Age	2.11	3	0.14	NS
Gender	0.82	1	0.36	NS
Education	8.22	3	0.01	**S**
Duration of Diabetes	6.54	3	0.03	**S**
Family History	1.98	1	0.16	NS

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Interpretation:

Education and duration of diabetes were significantly associated with knowledge levels, suggesting that higher education and longer disease experience contribute to better awareness and prevention practices.

Discussion

The findings revealed that most diabetic patients had inadequate knowledge about the disease and its complications prior to the teaching programme. The post-test results demonstrated a substantial improvement in knowledge levels following the STP. The improvement in scores underscores the importance of structured education as an effective intervention to enhance self-care and prevent complications. Similar findings were reported in studies by Sharma et al. (2022) and Singh & Patel (2021), who emphasized the role of health education in diabetes management.

Conclusion

The study concludes that the Structured Teaching Programme significantly improved the knowledge and preventive practices of diabetic patients regarding complications. Continuous education and follow-up are crucial to sustain these improvements and enhance the overall quality of diabetic care.

Recommendations

1. Regular diabetic education sessions should be incorporated into hospital outpatient departments.
2. Similar studies can be conducted on larger samples to validate the findings.
3. Awareness campaigns and community-based health education programmes should be initiated.
4. Nurses should play an active role in educating patients and families about diabetes management.
5. Periodic assessments should be carried out to evaluate patient adherence to preventive practices.
6. Training modules for healthcare workers should include updated guidelines on diabetic complication prevention.

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Conflicts of interests: There is no conflict of interest

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