

ASSESSMENT OF KNOWLEDGE AMONG NURSES REGARDING DIABETES MELLITUS WORKING IN TERTIARY CARE HOSPITALS OF PESHAWAR

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Abstract

Background: Diabetes Mellitus (DM) is a growing global health concern, with significant implications for both patients and healthcare systems. Effective management requires comprehensive knowledge, particularly among nurses who play a critical role in patient education, medication administration, and complication prevention. In regions like Peshawar, Pakistan, where diabetes prevalence is rising, assessing the knowledge level of nursing professionals is essential for improving care outcomes.

Aim: This study aims to assess the knowledge of nurses working in tertiary care hospitals of Peshawar regarding Diabetes Mellitus.

Methods: A descriptive cross-sectional study was conducted in the endocrinology and medical wards of three tertiary care hospitals in Peshawar: Lady Reading Hospital, Khyber Teaching Hospital, and Hayatabad Medical Complex. A total sample of 100 registered nurses was selected using a convenience sampling technique. Data were collected through a validated questionnaire (Cronbach's alpha = 0.7) and analyzed using SPSS version 22.0, with descriptive statistics and Pearson correlation tests employed to evaluate knowledge levels and demographic associations.

Results: The majority of participants held a BSN degree and were stationed at LRH. While overall knowledge scores were moderately high (mean = 38.10, $p < 0.001$), significant gaps were identified in key areas such as diagnostic criteria, hypoglycemia management, exercise importance, and dietary guidelines. No statistically significant correlation was found between demographic variables and knowledge levels ($p > 0.05$), indicating that knowledge gaps were widespread across all subgroups.

Conclusion: Although nurses demonstrated a basic understanding of diabetes, critical knowledge deficits persist—particularly in dietary management, insulin administration, and complication recognition. These findings highlight the urgent need for targeted, ongoing professional education and training programs to enhance nursing competencies in diabetes care and ensure safer, more effective patient outcomes.

INTRODUCTION

The increasing prevalence of diabetes worldwide has significantly expanded the responsibilities of nurses in patient care and education. With over 415 million diagnosed cases globally, projected to rise to 642 million by 2040, particularly affecting low/middle-income countries like Saudi Arabia, effective management is crucial to mitigate complications and associated chronic diseases. Diabetes self-care involves dietary management, medication adherence, and blood glucose monitoring, all requiring patients to be well-informed. Nurses play a vital role in guiding patients through education and counseling for self-care practices. Studies have highlighted insufficient knowledge in medication management, including insulin treatment, and a lack of awareness regarding associated complications. (Alotaibi, Gholizadeh, Al-Ganmi, & Perry, 2017)

Moreover managing diabetes mellitus (DM) is intricate, requiring expertise from both healthcare providers and patients. Currently affecting approximately 8.3% of the global population, with rising rates worldwide, DM is characterized by high blood sugar levels due to issues with insulin secretion or action. It encompasses three main types: type 1, which is an autoimmune disease causing a complete lack of insulin; type 2, marked by a gradual decline in insulin secretion alongside insulin resistance; and gestational diabetes, occurring during pregnancy. Diabetes is associated with various complications, including chronic kidney disease, vision impairment, amputations, and cardiovascular issues. (Alotaibi, Al-Ganmi, Gholizadeh, & Perry, 2016)

Studies, including the National Diabetes Inpatient Audit 2017, highlight a significant proportion of patients experiencing medication errors related to insulin. These errors often stem from insufficient knowledge among healthcare professionals regarding safe insulin administration, including dosage, route, timing, and preparation, interactions with comorbidities, storage, and transportation. Such inadequacies contribute to medication errors and patient harm, making insulin one of the most commonly associated drugs with such errors and resulting patient harm. (R. Singh, Thilagawathi, Mansoor, & Verma, 2020)

Diabetes mellitus (DM) is a metabolic disorder characterized by chronic hyperglycemia, affecting a

significant portion of the global population and projected to increase further due to factors like sedentary lifestyles and dietary changes. Pakistan is particularly impacted, with a substantial number of individuals affected by DM and an expected rise in cases, making it one of the leading countries in DM prevalence. The associated complications, especially foot problems, pose significant health challenges, leading to mortality, amputations, and hospital admissions. Factors such as angioplasty, mechanical stress, and neuropathy contribute to foot ulcer development, underscoring the importance of regular screening for diabetic patients. Preventing foot complications is crucial as they are largely preventable, with poor foot care practices and knowledge being significant risk factors. (Haq, Durrani, Nasim, & Riaz, 2017)

The initial classification of diabetes by WHO in 1980 underwent revisions in 1985, distinguishing primary from secondary diabetes, with primary diabetes being the main focus. It encompasses various clinical stages and etiological types, emphasizing the heterogeneous nature of the condition. The recent classification identifies four types of diabetes: type 1, type 2, "other specific types," and gestational diabetes, omitting terms like IDDM and NIDDM. Type 1 diabetes, previously known as insulin-dependent diabetes, typically affects children and young adults, often characterized by autoimmune processes leading to beta-cell destruction and necessitating insulin treatment. Type 2 diabetes, formerly termed non-insulin-dependent diabetes, involves insulin resistance, often seen in older adults with risk factors including obesity and sedentary lifestyle, predisposing to vascular and neurological complications (Kumar, R., Saha, P., Kumar, Y., Sahana, S., Dubey, A., & Prakash, O., 2020).

Type 1 diabetes (T1D) results from a complex interaction of genetic, epigenetic, and environmental factors. Advances in genetic research have revealed the heterogeneity of childhood diabetes, identifying key genetic variants such as those in the HLA gene. Genome-wide studies have uncovered additional genetic loci, though further exploration is needed. T1D exhibits high heritability and a significant concordance rate in twins, underscoring the interplay between genetics and environment. Epigenetic

changes, including DNA methylation and microRNA dysregulation, contribute to altered gene expression in T1D, emphasizing the multifaceted nature of its development. (Stankov, Benc, & Draskovic, 2013)

Type 1 diabetes mellitus (T1DM) constitutes a small portion of diabetes cases, characterized by the immune system's destruction of insulin-producing cells in the pancreas. On the other hand, Type 2 diabetes mellitus (T2DM) represents the majority of cases, featuring reduced responsiveness to insulin, often linked to factors like obesity and age. Gestational diabetes mellitus (GDM) emerges during pregnancy and poses risks for both mothers and babies, increasing the likelihood of future diabetes. Monogenic diabetes results from specific genetic mutations, while secondary diabetes arises from other health conditions or medication use, emphasizing the diverse origins of diabetes (Goyal et al, 2018)

The South East Asia region is projected to witness a surge in the number of patients with type 2 diabetes (T2 DM) by 2030 if preventive measures are not implemented. Additionally, non-diabetic individuals exhibited average awareness of diabetes risk factors, underscoring the need for targeted education to improve population-wide awareness. Knowledge is fundamental for individuals and communities to prevent, treat, and control chronic diseases like diabetes. (Odili & Eke, 2010)

There's growing evidence suggesting that chronic lack of sleep can raise the risk of type 2 diabetes and obesity. Restless sleep reduces insulin sensitivity and glucose tolerance, increasing cortisol levels which impairs insulin function. Adequate sleep is vital for overall health and performance, with insufficient sleep linked to weight gain. Melatonin deficiency is associated with metabolic dysregulation and decreased immunity, potentially increasing the risk of various health issues including diabetes and cancer. Understanding the importance of optimal sleep duration and quality is crucial for managing type 2 diabetes, highlighting the need for effective treatment options and targeted therapies based on neuroimaging research (von Deneen, 2022 & Azizah, 2022)

1.3 Rationale

Nurses play a central role in the management and care of patients with diabetes. Their knowledge directly

impacts the quality of care provided to diabetic patients. Diabetes management involves various medications, insulin administration, blood glucose monitoring, and dietary considerations. Lack of knowledge among nurses can lead to medication errors, mismanagement of insulin doses, and failure to recognize and respond to complications promptly, posing risks to patient safety.

1.4 Objective of this study

To assess the knowledge of nurse of tertiary care hospitals of Peshawar regarding diabetes Mellitus.

1.5 Research Question

What is the the knowledge of nurse of tertiary care hospitals of Peshawar regarding diabetes Mellitus?

Operational Definition

Diabetes Mellitus: Diabetes Mellitus is a chronic condition characterized by high blood glucose levels due to insufficient insulin production or action. It is diagnosed when fasting plasma glucose is ≥ 126 mg/dL, 2-hour OGTT plasma glucose is ≥ 200 mg/dL, HbA1c is $\geq 6.5\%$, or random plasma glucose is ≥ 200 mg/dL with symptoms. It includes Type 1, Type 2, gestational diabetes, and other specific types.

Childhood diabetes: Childhood diabetes, often Type 1 Diabetes Mellitus, is a chronic condition marked by high blood glucose due to autoimmune destruction of pancreatic beta cells. It is diagnosed with fasting plasma glucose ≥ 126 mg/dL, 2-hour OGTT plasma glucose ≥ 200 mg/dL, HbA1c $\geq 6.5\%$, or random plasma glucose ≥ 200 mg/dL with symptoms. It requires lifelong insulin therapy and regular blood glucose monitoring.

Metabolic dysregulation: Metabolic dysregulation is a condition characterized by abnormalities in metabolic processes, leading to imbalances in glucose, lipid, and protein metabolism. It is often identified by insulin resistance, elevated blood glucose, abnormal lipid levels, and increased inflammatory markers. This condition is associated with obesity, type 2 diabetes, and cardiovascular diseases.

1.6 Significance of the Study

The significance of a study assessing nurses' knowledge about diabetes lies in its potential to

address several critical aspects of healthcare by assessing nurses' diabetes knowledge can directly improve patient outcomes and quality of care, potentially reducing healthcare costs. It empowers the nursing profession, promotes interdisciplinary collaboration, and informs policies and practices. Additionally, it helps address health disparities by identifying gaps and targeting interventions for underserved populations.

METHADODOLOGY

3.1 INTRODUCTION

It is a crucial section of a research paper, thesis, or any academic or scientific document. It outlines the approach and techniques that will be used to gather and analyze data, conduct experiments, or address research questions. The methodology introduction provides a clear and concise overview of the steps you will take to achieve your research objectives. This section helps readers understand the reliability and

3.5 Sampling Technique

Convenient sampling technique was used for data collection.

3.6 Sample Selection

3.6.1 Inclusion criteria

The included participant of the study will be the Registered Nursing officer of endocrinology and Medical ward only and having more than one-year experience.

3.6.2 Exclusion Criteria

The exclusion criteria for this study was those RN Officers who are not willing to participate and RN Officers of the other wards and those who have less than one-year experience.

3.7 Data Collection Tool

Adopted questionnaire (5 Likert scale) cronbach's alpha 0.7 has been used for data collection, including

validity of your research and allows them to assess the rigor of your methods.

3.2 Study Design

Descriptive Crossectional study

3.3 Study Settings

It is the setting where study was conducted. The study was carried out in the endocrinology and Medical wards of tertiary care hospital Peshawar (lady reading hospital, Khyber teaching Hospital and Hayatabad Medical Complex Peshawar.

3.4 Sample Size

In this study, the overall population comprises 135, the sample size of 100 was determined using Rao soft software. This sample size breaks down into 50 from LRH, 25 from KTH, and 25 from HMC Peshawar. The margin of error is set at 5%, and the confidence interval is 95%.

two section. Section A consist of demographic data while section B comprised of 09 items to assess knowledge among Nurses regarding Diabetes Mellitus working in tertiary care hospitals of Peshawar

3.8 Ethical Consideration

Approval from Graduate committee of the college
Approval from administration of study setting
Informed consent
Data collection through validated tools

3.9 Data Analysis

We will utilize Statistical Package for Social Sciences (SPSS) version 22.0 to perform data analysis. In the realm of descriptive statistics, we will compute the average and standard deviation for continuous variables like age. For categorical variables, we will determine frequencies and percentages.

Results

Age of the respondent

The mean age is approximately 30, indicating that the average age in the sample is around 30 years old. The median age being 30 means that half of the individuals are younger than or equal to 30, and half are older. The mode, 29, is the most frequently occurring age, which aligns with the frequency distribution showing 29 years as the highest frequency. A standard deviation of 1.94 indicates that the ages typically deviate from the mean by about 1.94 years, suggesting a relatively clustered age distribution around the mean. Fig 4.1

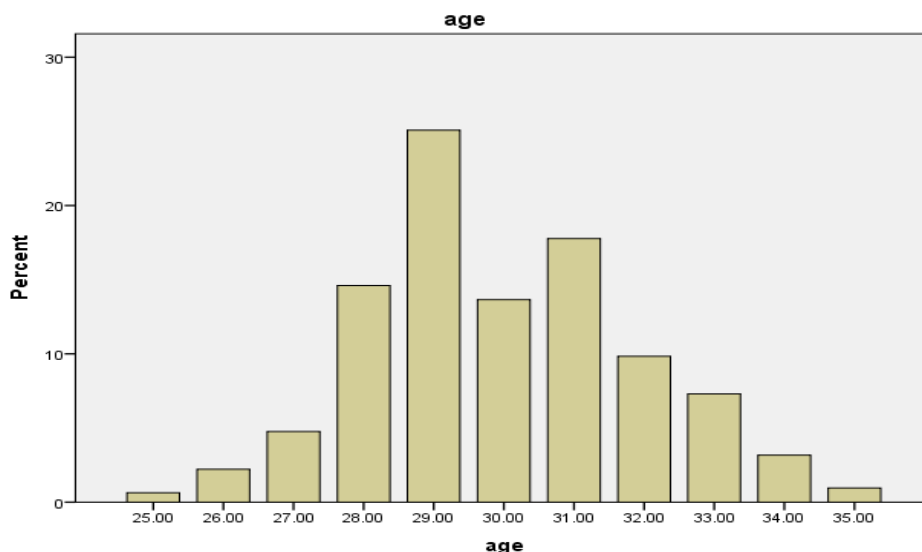


Fig 4.1

Gender Respondent

The gender distribution shows that the majority of the sample is male (52.38%), followed by female (47.62%). The mode of the dataset is **male**, as it is the most frequently occurring category. This distribution provides a clear picture of the gender composition in the sample, which can be useful for understanding demographic breakdowns in further analyses. Fig 4.2

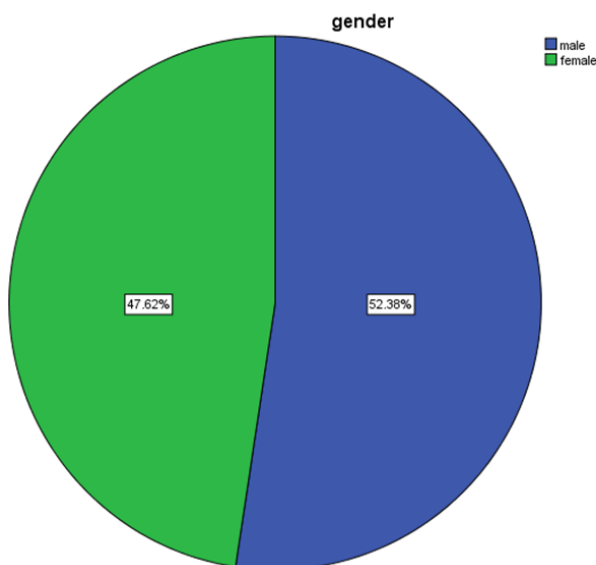


Fig 4.2

Marital Status of the Respondents

The marital status distribution shows that the majority of the sample is unmarried (61.0%), followed by married (39.0%). The mode of the dataset is **unmarried**, as it is the most frequently occurring category. This distribution provides a clear picture of the marital status composition in the sample, which can be useful for understanding demographic breakdowns in further analyses.

Fig 4.3

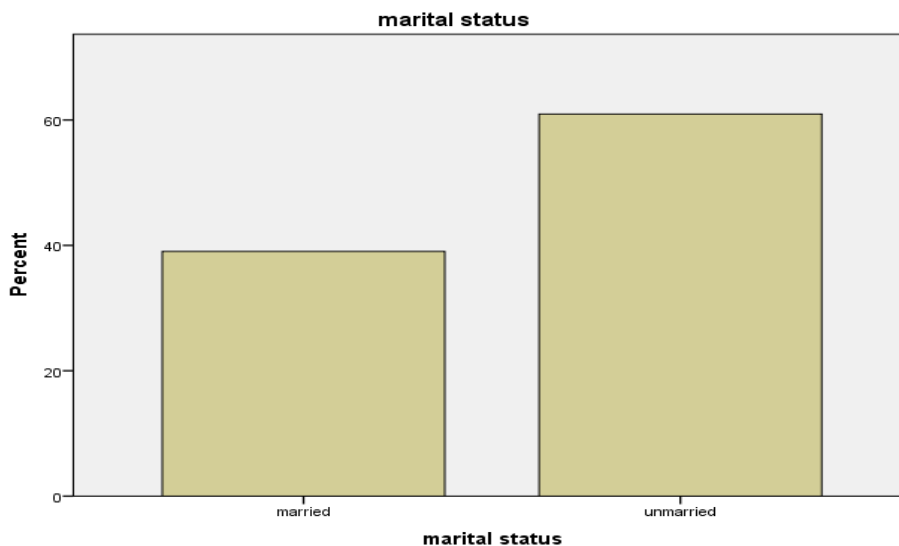


Fig 4.3

Education Of the respondents

The education distribution shows that the majority of the sample has a BSN (78.7%), followed by General Nursing (20.0%), and a small portion with an MSN (1.3%). The mode of the dataset is **BSN**, as it is the most frequently occurring category. This distribution provides a clear picture of the education composition in the sample, which can be useful for understanding demographic breakdowns in further analyses. Fig 4.4

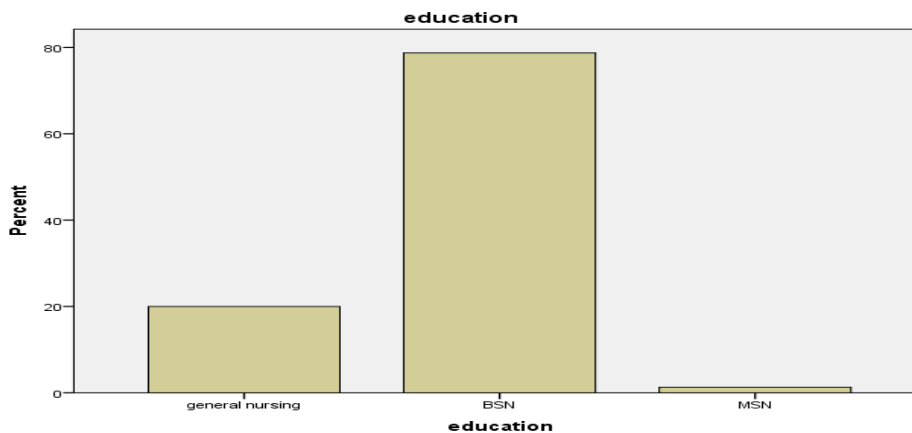


Fig 4.4

Hospitals of the Respondents

The duty placement hospital distribution shows that the majority of the sample is placed at LRH (43.2%), followed by KTH (30.8%), and HMC (26.0%). The mode of the dataset is **LRH**, as it is the most frequently occurring category.

This distribution provides a clear picture of the duty placement composition in the sample, which can be useful for understanding demographic breakdowns in further analyses. Fig 4.5

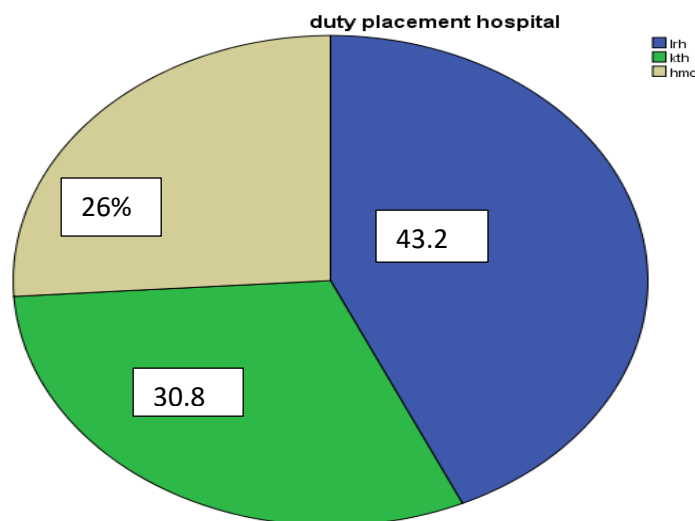


Fig 4.5

Assessing The Level of knowledge among Nurses

The analysis of the statistical data regarding the knowledge and attitudes of nurses towards diabetes reveals several insights. The mean values for the statements range from 1.63 to 2.50, with the majority being close to 2.0, which typically represents "disagreement" or "neutral" on a Likert scale. The standard deviations range from 0.54 to 0.82, indicating some variability in responses but not extreme. Most of the median values are 2.0, suggesting that the central tendency of responses is around disagreement or neutrality. Additionally, the mode for nearly all statements is 2.0, reinforcing the idea that the most common response is disagreement. This data suggests that there is a significant portion of the nurse respondents who do not have adequate knowledge about various aspects of diabetes management and its dietary implications, as their responses do not indicate strong agreement with key diabetic management principles. Therefore, it appears that there is a need

for improved education and training among nurses regarding diabetes to ensure they can provide the best care for diabetic patients. Let's prioritize each of the item one by one.

Diabetes patients should not exclude any nutrient from their diet.

The majority of respondents (88.6%) believe that excluding nutrients is not recommended for diabetes patients. This indicates that many people either hold the view that a balanced diet including all nutrients is essential for managing diabetes, or they may have concerns about the potential negative effects of nutrient exclusion. Only 11.4% of respondents are neutral on this issue, meaning they do not have a strong opinion either way. The cumulative percent for "Strongly Disagree" and "Disagree" shows that nearly 89% of the respondents are in agreement that excluding any nutrients is not advisable. Fig 4.6

Diabetes patients should not exclude any nutrient from their diet.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	STRONGLY DIS AGREE	153	48.6	48.6	48.6
	DISAGREE	126	40.0	40.0	88.6
	NEUTRAL	36	11.4	11.4	100.0
	Total	315	100.0	100.0	

Fig 4.6

Diabetic diet is calculated based on carbohydrates, proteins, and fats

The high percentage of respondents who **disagree** or **strongly disagree** suggests that there may be a view that a diabetic diet involves more complex considerations than just the macronutrient composition. This could include factors like glycemic index, portion sizes, and individual nutritional needs, which are not captured by a simple calculation of carbohydrates, proteins, and fats. Only 2.2% of respondents **agree** with the statement, indicating that the idea of calculating a diabetic diet strictly based on these macronutrients is not widely supported. Fig 4.7

A diabetic diet is calculated based on carbohydrates, proteins, and fats

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	STRONGLY DIS AGREE	51	16.2	16.2	16.2
	DISAGREE	230	73.0	73.0	89.2
	NEUTRAL	27	8.6	8.6	97.8
	AGREE	7	2.2	2.2	100.0
	Total	315	100.0	100.0	

Fig 4.7

Is you have enough Knowledge about Diabetes Mellitus

The high percentage of respondents who **disagree** or **strongly disagree** indicates a widespread perception of inadequate knowledge about Diabetes Mellitus. This could reflect a need for more education or resources regarding the disease. Only 4.4% of respondents **agree** with the statement, indicating that a very small portion of the population feels confident about their knowledge of Diabetes Mellitus. Fig 4.8

Is you have enough Knowledge about Diabetes Mellitus

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	STRONGLY DIS AGREE	87	27.6	27.6	27.6
	DISAGREE	145	46.0	46.0	73.7
	NEUTRAL	69	21.9	21.9	95.6
	AGREE	14	4.4	4.4	100.0
	Total	315	100.0	100.0	

Fig 4.8

The total amount of carbohydrates is more important than the type of carbohydrate in managing diabetes.

The significant percentage of respondents who **disagree** or **strongly disagree** indicates a belief in the importance of the type of carbohydrate (e.g., glycemic index) in addition to the total amount when managing diabetes. This reflects an understanding that not all carbohydrates have the same impact on blood glucose levels. Only 2.2% of respondents **agree** with the statement, indicating that very few people believe the total amount of carbohydrates is more important than their type. Fig 4.9

The total amount of carbohydrates is more important than the type of carbohydrate in managing diabetes.					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	STRONGLY DIS AGREE	26	8.3	8.3	8.3
	DISAGREE	158	50.2	50.2	58.4
	NEUTRAL	124	39.4	39.4	97.8
	AGREE	7	2.2	2.2	100.0
	Total	315	100.0	100.0	

Fig 4.9

Exercise plays an important role in the prevention and management of diabetes.

The relatively high percentage of respondents who **disagree** or **strongly disagree** suggests a lack of consensus or belief in the importance of exercise for diabetes management. This might reflect varying levels of awareness or differing opinions on the role of physical activity. The neutral responses (39.0%) suggest that many people are unsure about the role of exercise in diabetes management or may not have strong opinions on the topic. Fig 4.10

Exercise plays an important role in the prevention and management of diabetes.					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	STRONGLY DIS AGREE	23	7.3	7.3	7.3
	DISAGREE	141	44.8	44.8	52.1
	NEUTRAL	123	39.0	39.0	91.1
	AGREE	28	8.9	8.9	100.0
	Total	315	100.0	100.0	

Fig 4.10

The diagnostic standard for HbA1C in Diabetes is normal when less than 5.7%, Pre-Diabetes 5.7-6.4%, and Diabetes when greater than 6.5%.

The high percentage of respondents who **disagree** or **strongly disagree** indicates that there may be a general lack of agreement or belief in the accuracy of the stated diagnostic thresholds for HbA1C. It could also suggest a potential misunderstanding or misinformation about the standard diagnostic criteria. A relatively small percentage of respondents (7.0%) **agree** with the statement, indicating that only a few people believe the diagnostic standards for HbA1C are as stated. Fig 4.11

The diagnostic standard for HbA1C in Diabetes is normal when less than 5.7%, Pre-Diabetes 5.7-6.4%, and Diabetes when greater than 6.5%.

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid STRONGLY DIS AGREE	18	5.7	5.7	5.7
DISAGREE	165	52.4	52.4	58.1
NEUTRAL	110	34.9	34.9	93.0
AGREE	22	7.0	7.0	100.0
Total	315	100.0	100.0	

Fig 4.11

Diabetes is indicated by Fasting Plasma Glucose (FPG) of 6.1–6.9 mmol/dl

The significant percentage of respondents who **disagree** or **strongly disagree** suggests that the provided FPG range is not widely accepted as indicative of diabetes. According to standard medical guidelines, diabetes is typically diagnosed with an FPG level of 7.0 mmol/dl or higher, so this response may reflect awareness of the correct diagnostic criteria. Only 8.6% of respondents **agree** with the statement, indicating that a small proportion of people believe this FPG range is indicative of diabetes. Fig 4.12

Diabetes is indicated by Fasting Plasma Glucose (FPG) of 6.1–6.9 mmol/dl

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid STRONGLY DIS AGREE	23	7.3	7.3	7.3
DISAGREE	165	52.4	52.4	59.7
NEUTRAL	100	31.7	31.7	91.4
AGREE	27	8.6	8.6	100.0
Total	315	100.0	100.0	

Fig 4.12

Exercise plays an important role in the prevention and management of diabetes

The high percentage of respondents who **disagree** or **strongly disagree** implies that there is a prevalent belief or perception that exercise is not crucial for diabetes management. This could indicate a lack of awareness or understanding of the benefits of physical activity in diabetes prevention and control. A relatively small percentage of respondents (10.8%) **agree** with the statement, suggesting that only a minority recognizes the importance of exercise in diabetes management. Fig 4.13

Exercise plays an important role in the prevention and management of diabetes

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid STRONGLY DIS AGREE	9	2.9	2.9	2.9
DISAGREE	181	57.5	57.5	60.3
NEUTRAL	91	28.9	28.9	89.2
AGREE	34	10.8	10.8	100.0
Total	315	100.0	100.0	

Fig4.13

Symptomatic hypoglycemia could be treated using 3–4 cubes of sugar

A majority of respondents (55.3%) either **disagree** or **strongly disagree** with the statement. This suggests that most people do not believe that 3–4 cubes of sugar is an adequate treatment for symptomatic hypoglycemia. The high percentage of respondents who **disagree** or **strongly disagree** indicates that there is a general belief that treating symptomatic hypoglycemia might require more or different forms of treatment than just 3–4 cubes of sugar. This could reflect an awareness of more comprehensive or appropriate treatment strategies. Only 6.0% of respondents **agree** with the statement, suggesting that a small minority believes that 3–4 cubes of sugar is sufficient for treating symptomatic hypoglycemia. Fig 4.14

Symptomatic hypoglycemia could be treated using 3–4 cubes of sugar

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid STRONGLY DIS AGREE	27	8.6	8.6	8.6
DISAGREE	147	46.7	46.7	55.2
NEUTRAL	122	38.7	38.7	94.0
AGREE	19	6.0	6.0	100.0
Total	315	100.0	100.0	

Fig 4.14

Obesity and diabetes are closely related.

A significant majority of respondents (72.7%) either **disagree** or **strongly disagree** with the statement, indicating that most people do not believe there is a close relationship between obesity and diabetes. The high percentage of respondents who **disagree** or **strongly disagree** suggests a strong perception or belief that obesity is not closely related to diabetes. This could indicate a lack of awareness about the well-established link between obesity and an increased risk of developing diabetes. Only 4.1% of respondents **agree** with the statement, reflecting that a very small proportion of people recognize a close relationship between obesity and diabetes. Fig 4.15

Obesity and diabetes are closely related.

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid STRONGLY DIS AGREE	14	4.4	4.4	4.4
DISAGREE	215	68.3	68.3	72.7
NEUTRAL	73	23.2	23.2	95.9
AGREE	13	4.1	4.1	100.0
Total	315	100.0	100.0	

Fig 4.15

Diabetes patient should consume fruits

A majority of respondents (58.1%) either **disagree** or **strongly disagree** with the statement, suggesting that many people believe diabetes patients should not consume fruits, or that they should be cautious about their fruit intake. The high percentage of respondents who **disagree** or **strongly disagree** might reflect concerns about the sugar content in fruits and its impact on blood glucose levels in diabetes patients. There may be a belief that fruits could negatively affect blood sugar control. Only 4.8% of respondents **agree** with the statement, indicating that a small minority supports the idea of fruit consumption for diabetes patients. Fig 4.16

Diabetes patient should consume fruits

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	STRONGLY DIS AGREE	29	9.2	9.2	9.2
	DISAGREE	154	48.9	48.9	58.1
	NEUTRAL	117	37.1	37.1	95.2
	AGREE	15	4.8	4.8	100.0
	Total	315	100.0	100.0	

Fig 4.16

Diabetes patients should consume alcohol with meal

A significant majority of respondents (70.7%) either **disagree** or **strongly disagree** with the statement, suggesting that most people believe diabetes patients should not consume alcohol with meals. The high percentage of respondents who **disagree** or **strongly disagree** reflects a strong belief that alcohol consumption is not advisable for diabetes patients, even when taken with meals. This could be due to concerns about alcohol's impact on blood sugar levels and overall health. Only 6.7% of respondents **agree** with the statement, indicating that a small minority supports the idea of diabetes patients consuming alcohol with meals. Fig 4.17

Diabetes patients should consume alcohol with meal

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	STRONGLY DIS AGREE	14	4.4	4.4	4.4
	DISAGREE	209	66.3	66.3	70.8
	NEUTRAL	71	22.5	22.5	93.3
	AGREE	21	6.7	6.7	100.0
	Total	315	100.0	100.0	

Fig 4.17

Cholesterol should be restricted to 300 mg daily for diabetes

A significant majority of respondents (60.5%) either **disagree** or **strongly disagree** with the statement, indicating that most people do not believe that cholesterol should be restricted to 300 mg daily for diabetes patients. The high percentage of respondents who **disagree** or **strongly disagree** suggests that there is a prevalent belief that the 300 mg daily restriction on cholesterol is either unnecessary or not widely supported. This could reflect differing opinions on dietary guidelines or the perception that such restrictions may not be crucial for diabetes management. Only 4.8% of respondents **agree** with the statement, indicating that a small minority supports the idea of restricting cholesterol to 300 mg daily for diabetes patients. Fig 4.18

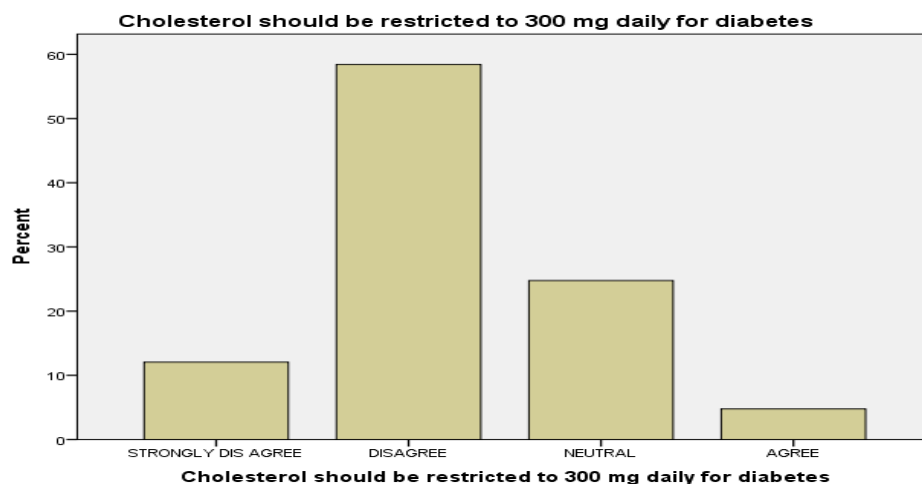


Fig 4.18

Diabetes patients should eat balanced diet

A significant majority of respondents (66.7%) either **disagree** or **strongly disagree** with the statement, suggesting that many people do not believe that diabetes patients should eat a balanced diet. The high percentage of respondents who **disagree** or **strongly disagree** implies that there may be a lack of understanding or belief in the importance of a balanced diet for diabetes management. This could reflect misconceptions about dietary requirements for diabetes patients or a preference for other dietary approaches. Only 5.7% of respondents **agree** with the statement, indicating that a small minority supports the idea of diabetes patients eating a balanced diet. Fig 4.19

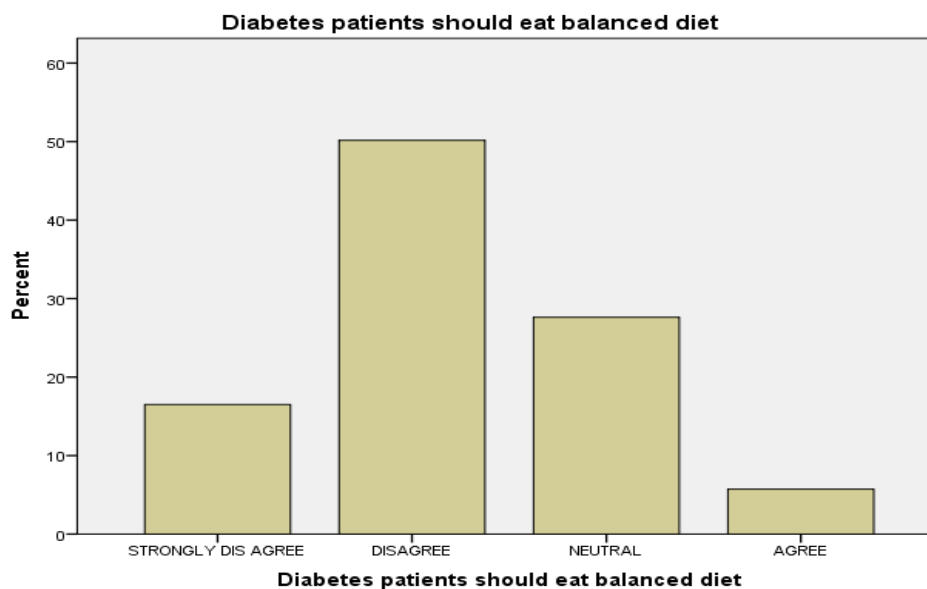


Fig 4.19

Is you have enough Knowledge about Insulin administration

A majority of respondents (51.4%) either **disagree** or **strongly disagree** with the statement, indicating that they do not believe they have enough knowledge about insulin administration. The high percentage of respondents who **disagree** or **strongly disagree** suggests that many people feel they lack sufficient knowledge about how to administer insulin. This could point to a need for more education and resources on this topic. A notable percentage of

respondents (24.1%) agree with the statement, indicating that almost a quarter of the respondents feel confident in their knowledge of insulin administration. Fig 4.20

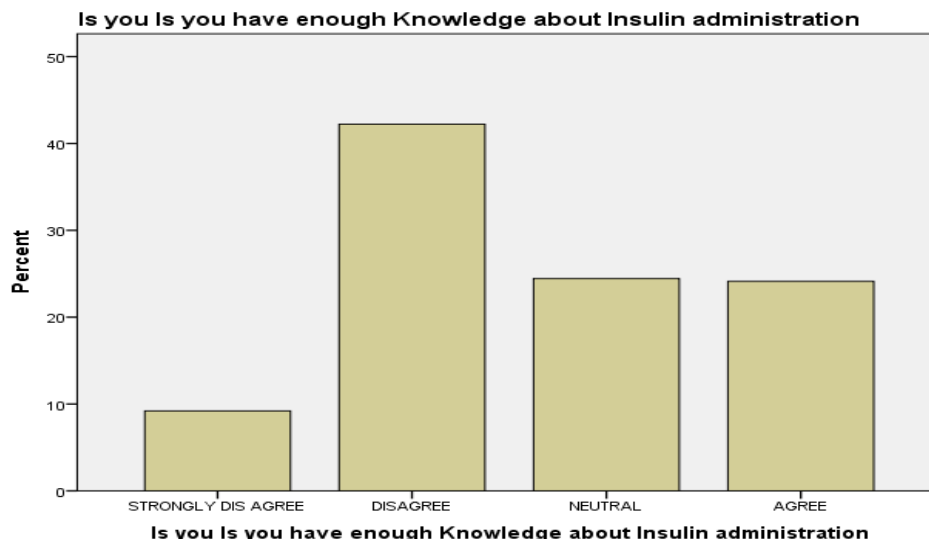


Fig 4.20

The majority of respondents (88.6%) believe that diabetes patients should not exclude any nutrient from their diet, highlighting the importance of a balanced diet. However, a high percentage disagree that a diabetic diet can be calculated based solely on carbohydrates, proteins, and fats, suggesting more complex dietary considerations. Most respondents also perceive their knowledge about Diabetes Mellitus and insulin administration as inadequate, indicating a need for better education. Many believe the type of carbohydrate is crucial in managing diabetes, while exercise's role is not widely recognized. Diagnostic criteria for HbA1C and FPG levels are also not well understood, with many disagreeing with the stated thresholds. The adequacy of 3-4 cubes of sugar for treating hypoglycemia is largely dismissed. Additionally, a significant number of respondents do not recognize the relationship between obesity and diabetes or the benefits of fruit consumption and alcohol restriction for diabetes patients. Furthermore, the majority are skeptical about restricting cholesterol to 300 mg daily and question the necessity of a balanced diet for diabetes management.

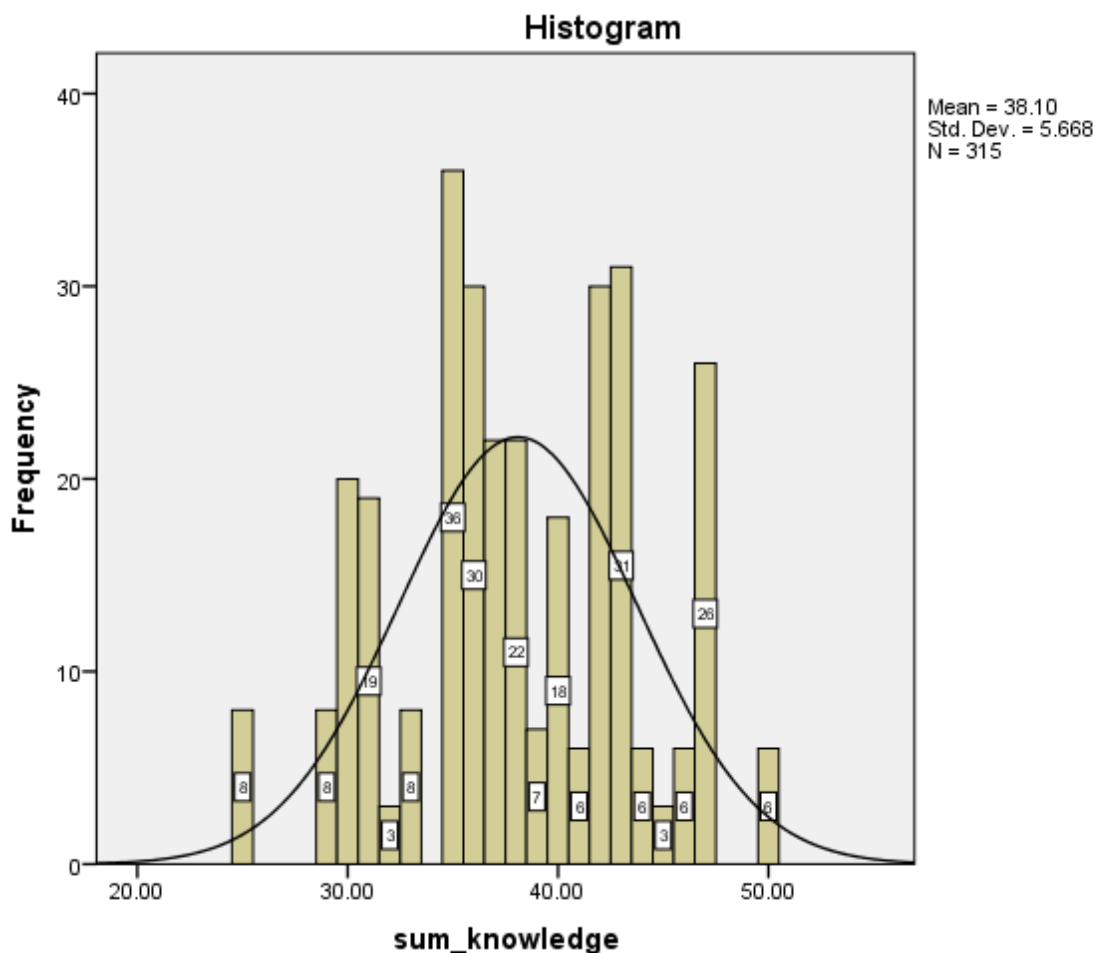
One-Sample Test						
	Test Value = 0					
				Mean Difference	95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)		Lower	Upper
sum knowledge	119.291	314	.000	38.09524	37.4669	38.7236

The one-sample t-test revealed a statistically significant difference in the mean knowledge score ($t(314)=119.291$, $p < 0.001$). The mean difference from the test value (0) is 38.10, with a 95% confidence interval ranging from 37.47 to 38.72. This indicates that the mean knowledge score is significantly greater than zero, suggesting a high level of knowledge among the participants.

Correlations between knowledge and demographic data		
	sum knowledge	demo_1

sum knowledge	Pearson Correlation	1	.092
	Sig. (2-tailed)		.105
	N	315	315
demo_1	Pearson Correlation	.092	1
	Sig. (2-tailed)	.105	
	N	315	315

The Pearson correlation between sum knowledge and demo_1 is $r=0.092$, with a p-value of 0.105. This indicates a weak positive correlation that is not statistically significant, suggesting that there is no meaningful relationship between the sum of knowledge and the demographic variable demo_1.



Frequency Distribution of sum_knowledge:
 The distribution of knowledge scores shows a range from 25.00 to 50.00.
 The most frequent score is 35.00, occurring in 36 cases (11.4% of the sample).

The knowledge scores are distributed with a higher concentration around 30.00 to 44.00, with percentages ranging from 1.0% to 11.4%.

The cumulative percentage reaches 100.0% at a score of 50.00, indicating complete data coverage across the range of scores.

Summary of the result

The analysis of the survey data reveals several key findings about the demographic characteristics, educational background, and knowledge levels among nurses regarding diabetes management.

Demographics:

- **Age:** The average age of respondents is around 30 years, with a median of 30 and a mode of 29. The standard deviation of 1.94 suggests a relatively clustered age distribution around the mean.
- **Gender:** The sample consists of 52.38% males and 47.62% females, indicating a slight male predominance.
- **Marital Status:** A majority of respondents are unmarried (61.0%), with married individuals comprising 39.0%.
- **Education:** The majority hold a Bachelor of Science in Nursing (BSN) degree (78.7%), followed by General Nursing diplomas (20.0%), and a small proportion with a Master of Science in Nursing (1.3%).
- **Hospital Placement:** Most respondents are stationed at LRH (43.2%), followed by KTH (30.8%) and HMC (26.0%).

Knowledge Assessment: The statistical analysis indicates a high mean knowledge score (38.10), significantly greater than zero ($t(314) = 119.291$, $p < 0.001$), suggesting a general level of knowledge among respondents. However, the Pearson correlation between knowledge scores and demographic data ($r = 0.092$, $p = 0.105$) reveals no significant relationship, implying that demographic factors do not strongly influence knowledge levels.

Key Findings on Diabetes Knowledge:

- **Nutrient Exclusion:** Most respondents (88.6%) agree that diabetes patients should not exclude any nutrients from their diet.
- **Diabetic Diet Calculation:** There is a strong disagreement with the notion that diabetic diets are based solely on macronutrient calculations,

reflecting a more complex understanding of dietary needs.

- **Knowledge Adequacy:** A high percentage of respondents feel they lack sufficient knowledge about Diabetes Mellitus and insulin administration, highlighting a need for improved education.
- **Role of Exercise:** Exercise is not widely recognized for its importance in diabetes management, with many respondents expressing skepticism.
- **Diagnostic Criteria:** There is a general misunderstanding of diagnostic criteria for HbA1C and FPG levels, with many disagreeing with standard thresholds.
- **Hypoglycemia Treatment:** Most respondents disagree that 3–4 cubes of sugar are adequate for treating symptomatic hypoglycemia, suggesting a more comprehensive view of treatment is needed.
- **Obesity and Diabetes:** A significant number of respondents do not acknowledge the close relationship between obesity and diabetes, indicating potential gaps in understanding.
- **Dietary Restrictions:** The majority disagree with restricting cholesterol intake to 300 mg daily and question the necessity of a balanced diet for diabetes management.

Overall, these findings suggest that while some knowledge is present, there are significant gaps in understanding critical aspects of diabetes management among nurses. Enhanced educational interventions are necessary to address these gaps and improve care quality for diabetic patients.

Discussion

In this study nurses' knowledge and attitudes towards diabetes management reveals several insights. Most respondents (88.6%) emphasize the importance of a balanced diet without excluding any nutrient. However, many disagree that a diabetic diet can be calculated solely based on carbohydrates, proteins, and fats, indicating more complex dietary considerations. Respondents also feel inadequately

informed about Diabetes Mellitus and insulin administration, highlighting a need for better education. Many believe the type of carbohydrate is critical in managing diabetes, while the role of exercise is not widely acknowledged. There is confusion about the diagnostic criteria for HbA1C and FPG levels, and the adequacy of 3-4 cubes of sugar for treating hypoglycemia is largely dismissed. Additionally, many do not recognize the link between obesity and diabetes or the benefits of fruit consumption and alcohol restriction for diabetes patients. The majority are skeptical about restricting cholesterol to 300 mg daily and question the necessity of a balanced diet for diabetes management. The mean values for responses range from 1.63 to 2.50, with most around 2.0, indicating disagreement or neutrality on a Likert scale. Standard deviations range from 0.54 to 0.82, showing some variability but not extreme. Median and mode values of 2.0 suggest that disagreement is the most common response. This indicates a significant portion of nurse respondents lack adequate knowledge about diabetes management, underscoring the need for improved education and training to ensure better care for diabetic patients.

In contrast In Palestine, diabetes mellitus is a rapidly increasing health issue. This study assessed the knowledge, attitude, and practices of patients with regarding their condition. It also explored the relationships between these factors and the patients' sociodemographic and clinical characteristics, and identified predictors of higher knowledge, positive attitudes, and good practices. The cross-sectional study took place in primary healthcare facilities across the West Bank, Palestine, from October 2018 to January 2019. An interviewer-administered questionnaire was used to evaluate the knowledge, attitudes, and practices of T2DM patients. Out of 300 invited patients, 220 (73.3%) participated. The median age was 57 years, with a median of 7 years since diagnosis. Median fasting blood glucose was 150 mg/dL, postprandial glucose was 230 mg/dL, HbA1c was 7.8%, and BMI was 28.8 kg/m². Median scores were 6.0/13.0 for knowledge, 3.0/4.0 for attitude, and 3.0/5.0 for practice. Higher knowledge scores were strongly associated with having a university education ($p = 0.001$), and attending an educational program on diabetes was moderately associated with higher practice scores ($p = 0.026$). The study highlights

the need (Shawahna, Samaro, & Ahmad, 2021; S. Singh, Jajoo, Shukla, & Acharya, 2020).

Another study was conducted on public knowledge and awareness of diabetes mellitus (DM) among the Saudi Arabian population, we adhered to the PRISMA guidelines for this systematic review. In February 2018, we conducted literature searches using PubMed, Scopus, BIOSIS Citation Index, and Web of Science with the keywords: "Knowledge" OR "Awareness" AND "Diabetes Mellitus" AND "Saudi Arabia." Relevant studies were selected and synthesized narratively from the screened records. Most studies identified a significant lack of public awareness regarding the risk factors and complications associated with DM. Additionally, medical students and healthcare workers displayed insufficient knowledge about the disease's epidemiology and proper insulin injection techniques. This review underscores the urgent need to enhance DM knowledge and awareness among the Saudi population. Strategies to improve understanding of DM should be integrated into existing healthcare systems and processes to better educate patients, families, and communities about this chronic disease (Alanazi et al., 2018; Khamaiseh & Alshloul, 2019).

Similarly another study was conducted Between October 2016 and June 2017, 348 patients were approached for a study, with 142 ultimately randomized into intervention and control groups of 72 each. The 24-week follow-up saw 4.2% dropout, predominantly from the control group. Baseline characteristics were similar across groups, indicating effective randomization, though lower-income individuals were more likely to withdraw. Participants averaged 54.2 years old, 65.5% were female, and 58.5% had an HbA1c $\geq 9\%$. Two-way ANOVA with repeated measures showed significant improvements in the intervention group for HbA1c, systolic and diastolic blood pressure, efficacy expectation, outcome expectation, and diabetes self-management behaviors. Quality of life scores also showed a significant interaction effect over time. Despite no significant differences in lipid profiles except triglycerides, the study underscored the intervention's effectiveness in improving glycemic control and highlighted the importance of addressing

socioeconomic factors to enhance study retention and outcomes (Azami et al., 2018).

Moreover another study was done in Pakistan Low knowledge about diabetes risk factors, combined with high disease prevalence, is common in low-resource countries. This study assessed diabetes-related knowledge, attitudes, and practices among the general population in Punjab, Pakistan. Conducted between January and March 2017, the cross-sectional study surveyed 2,019 adults aged 18–90 years across five districts through face-to-face interviews using a semi-structured questionnaire. Knowledge scores ranged from 0 to 9, with scores of 6 or higher indicating adequate awareness. Descriptive statistics, chi-square tests, and linear and binary logistic regression were used for analysis. The average respondent age was 32.92 ± 11.4 years. Of the respondents, 85.9% had heard of diabetes, and 30.1% were aware of the glucose tolerance test. Notably, 2.3% had zero diabetes knowledge, 11.3% scored a perfect 9, and 47.4% had adequate awareness. Significant factors associated with higher knowledge scores included being female ($\beta = 0.37$, 95% CI: 0.16, 0.05; $p = 0.001$), socioeconomic status ($\beta = 0.24$, 95% CI: 0.12, 0.36; $p < 0.001$), having diabetes ($\beta = 0.82$, 95% CI: 0.53, 1.10; $p < 0.001$), and higher education levels ($\beta = 0.25$, 95% CI: 0.17, 0.33; $p < 0.001$). Respondents with higher socioeconomic status had significantly more positive attitudes toward diabetes than those with lower status (adjusted odds ratio 1.57, 95% CI: 1.12, 2.24). Among those diagnosed with diabetes, only 8.7% (30/343) had never undergone blood glucose screening since their diagnosis. The study concludes that public knowledge of diabetes risk factors, management, and care is low in Pakistan, highlighting the need for targeted national education programs to improve understanding of diabetes prevention and treatment (Gillani et al., 2018).

Conclusion

The study reveals significant gaps in the general population's knowledge and attitudes toward diabetes management in Punjab, Pakistan. A substantial majority of respondents misunderstand essential aspects of a diabetic diet, the importance of specific nutrients, and the criteria for diagnosing and managing diabetes. Many do not recognize the critical roles of carbohydrate types, exercise, and obesity in

diabetes management. There is also confusion regarding the appropriate treatment for hypoglycemia and the benefits of fruit consumption, alcohol restriction, and cholesterol management.

Recommendations

Implement national-level public education programs to enhance understanding of diabetes prevention, management, and treatment. These programs should emphasize the importance of a balanced diet, the role of different nutrients, and the necessity of regular exercise. Train healthcare providers to offer clear, consistent, and practical dietary advice to diabetes patients. This training should include information on the significance of various types of carbohydrates and the role of physical activity in diabetes management.

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