

# Exploring Nursing Proficiency in Diabetes Management and Patient Support in Saudi Arabia

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## ABSTRACT

This study investigates the knowledge, attitudes, and practices (KAP) of nurses in Saudi Arabia regarding diabetes management. With diabetes rates rising globally, including significant prevalence in Saudi Arabia, nurses play a critical role in patient care and education. This research assesses nurses' KAP levels through a survey of 236 participants, analyzing their familiarity with diabetes-related pathophysiology, diagnostic criteria, and management practices. The findings indicate high general knowledge, especially in medication protocols and blood glucose monitoring. While nurses generally hold positive attitudes toward diabetes care, some lack motivation for extended patient interaction and ongoing education. Practical adherence to protocols is high. These results suggest that enhanced training, especially in patient-centered care and complication management, could improve care outcomes. This study highlights the importance of targeted education to empower nurses, ultimately enhancing diabetes care quality and patient outcomes in Saudi Arabia.

**KEYWORDS:** Nursing Proficiency, Diabetes Management, Patient Support, Saudi Arabia Healthcare, Nursing Skills.

## 1. Introduction

Diabetes mellitus (DM), which is defined by persistent hyperglycemia due to problems with insulin secretion, action, or both, is a serious worldwide public health concern (Rachdaoui, 2020; Soomro & Jabbar, 2024). According to the International Diabetes Federation (IDF), around 537 million persons had diabetes in 2021, and by 2030, the number is predicted to increase to 643 million (Hossain et al., 2024; Kumar et al., 2024). The prevalence of diabetes mellitus (DM) among Saudi Arabians aged 15 and older was 8.5%.

This chronic metabolic disease, which affects people from all socioeconomic backgrounds and presents increasing challenges globally, is characterized by either insufficient insulin production or the body's inability to use insulin efficiently (Butt et al., 2023). It is regarded as one of the primary causes of disease and death globally; concerning, diabetes was responsible for about 5 million deaths in people aged 20 to 79 in 2015 (Bommer et al., 2017; Ogurtsova et al., 2017). Numerous outcomes, such as cerebrovascular diseases, renal failure, vision impairment, cardiovascular disorders, and limb amputations, can be linked to the elevated death rates (Dal Canto et al., 2019; Lazzarini et al., 2018). The global trend toward more sedentary lives and societal shifts that promote unhealthy eating patterns and lower levels of physical activity exacerbate these detrimental effects. In order to lower the incidence of DM and improve public health outcomes, it is imperative that the elimination of these risk factors be given top priority (Schulze & Hu, 2005).

Since nurses are frequently the primary caregivers and actively participate in patient education and care, they are essential to the management of diabetes (Sørensen et al., 2020). It is becoming more widely acknowledged that good diabetes control requires holistic management, which includes a thorough, multifaceted approach to care. Finding gaps in the current healthcare system and creating focused educational and training initiatives require evaluating nurses' knowledge of holistic diabetes management (McGill et al., 2007).

Nurses are in a better position than other healthcare professionals to educate and care for patients with diabetes because they spend the most time with patients in the healthcare setting. Furthermore, nurses are typically in a better position than other medical specialists, including doctors and physicians, to advise patients on the best care practices and different illness management strategies. Compared to other medical professionals, nurses are better listeners and know more about patients with diabetes, according to Lou et al. (2014). This implies that they should have a more positive attitude and be more dedicated to helping patients with diabetes than other medical professionals. The attitude of nurses has a significant impact on how patients are treated and how their illnesses are managed (Lou et al., 2014).

According to research, nurses have the worst attitudes and perceptions regarding the care of patients with diabetes. For example, nurses' judgments about the severity of the illness influence their choices to enhance patient care and management. When it comes to specialist care for specific diseases, nurses' attitudes are crucial (Blaser & Berset, 2019). They will provide lower-quality treatment and be less interested about providing care services if they believe a condition to be less serious. Nurses' attitudes and perceptions of the significance of diabetes are lower since the majority of them

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To provide patients with diabetes with high-quality treatment, specific training is required to teach them the daily self-care management and monitoring tasks. This aids in learning about the several lifestyle adjustments that diabetic people should undertake to reduce the issues that come with their condition. Nurses who have undergone specific training in the treatment and monitoring of patients with diabetes exhibit a more positive attitude and perception of their patients than nurses who have not, according to Odili and Oparah (2012). This is a result of their improved comprehension of these patients' demands and their familiarity with the care activities they need. Therefore, whether nurses have received specific training on diabetes has a significant impact on their attitudes and perceptions on the care of patients with diabetes (Odili: Attitudes of Health Care Professionals toward... - Google Scholar, n.d.).

Nurses' perceives regarding daily blood glucose management are another factor that influences how they treat patients with diabetes. Since diabetes is caused by elevated blood sugar levels relative to insulin levels, it is crucial for patients with the disease to regularly check their blood glucose levels. This can have a significant impact on their health. The care of patients with diabetes is viewed and viewed favourably by nurses who respect the necessity of regular blood glucose control. For nurses who don't perceive the benefit of regularly monitoring blood glucose levels, the situation is the opposite. Blood glucose control is important to nurses, who recognize the necessity to provide this care to patients and have no problem doing so (Bisheya, El-Mijbri, Beshyah, & Sherif, 2011). Individuals with a bad attitude and perception may not want to provide such care services to patients with diabetes if they do not understand the need of controlling blood glucose levels on a regular basis (Bisheya et al., 2022).

Another aspect that affects nurses' attitudes and perceptions regarding care for patients with diabetes is their understanding of the disease's effects on patients. They provide high-quality services and have favourable attitudes regarding providing care and daily patient monitoring if they believe the consequences on patients are significant. This is since nurses' attitudes and the degree of care they provide to patients are influenced by the severity of a sickness; patients with less serious illnesses receive less attention and care than those with more serious illnesses.

Enhancing nurses' abilities has been linked to better patient outcomes, direct care, and assistance with self-management strategies in the treatment of diabetes, according to studies (Farzaei et al., 2023; Qasim et al., 2020). On the other hand, little data about the KAP among Saudi Arabian nurses with reference to the comprehensive treatment of DM is currently available ("Assessment of Nurses' Knowledge, Attitude and Practice Regarding Nutritional Care Management of Diabetic Patients in Benha University Hospital," 2024).

According to a few studies, nurses' knowledge of diabetes treatment varies, and this variation is frequently linked to variations in educational attainment, local healthcare regulations, and the resources that are accessible (Alkubati et al., 2023; Farzaei et al., 2023; Wang et al., 2020). Understanding these discrepancies is essential for creating

focused educational initiatives, financial support, and legislative measures meant to improve comprehensive diabetes treatment (Wang et al., 2020). Furthermore, ongoing professional development and training are critical for nursing staff due to the quick changes in diabetes treatment regimens and the incorporation of technology advancements in patient care (Yin et al., 2021).

### Study problem

Diabetes mellitus is associated with a wide range of complications that can be classified into two main categories: and microangiopathy and large vessel disease, or microvascular and macrovascular disease. The microvascular disease includes diabetic neuropathy, nephropathy and retinopathy while macrovascular comprises coronary artery diseases, cerebrovascular accidents and peripheral vascular disease.

Diabetic individuals are prone to microvascular disease and can experience considerable amounts of morbidity due to these diseases. Diabetic neuropathy presents in up to 50% of people in with the disease and hyperglycemia is a major predisposing factor (Deshpande et al., 2008). This condition presents with such complications as loss of sensation, muscle weakness and pain, resulting in foot ulceration and an elevated level of lower limb amputations (Forbes & Cooper, 2013).

Diabetic nephropathy is one other difficult to manage microvascular complications that affects the kidneys and can culminate to end stage renal disease. Nephropathy as a complication of diabetes has also declined in the past decades with increased substantive glycemic control and hypertension; however, it remains a major unaddressed problem today (Papatheodorou et al., 2018). Diabetic nephropathy leads to increased risk of developing more complications among them cardiovascular diseases among patients with diabetes (Papatheodorou et al., 2018).

Diabetes related retinopathy is a common complication of prolonged diabetes and can culminate in blindness if the condition is not well controlled. The evidences further suggest that diabetic retinopathy is closely associated with duration of diabetes and glycemic control. Screening for eye health should be ordered commonly in patients with diabetes to avoid blindness (Papatheodorou et al., 2018).

Macroangiopathy develops due to affection of large blood vessels, which contributes to most of cardiovascular morbi-mortality in diabetic subjects. Cardiac disease is also a major cause of mortality among diabetic clients. The cardiovascular disease risk factors for this population include high blood pressure, high cholesterol and smoking (Tomic et al., 2022).

Macrovascular diseases and stroke are another complication of diabetes mellitus that has been established in diabetic patients. Cohort analysis also reveals that patients with diabetes have a higher risk of suffering a stroke than people without diabetes. Such epidemiological changes increase the risk of cardiovascular diseases in diabetic patients and require constant screening of cardiovascular health in diabetic patients (Iradukunda et al., 2021).

Diabetic patients also suffer from peripheral artery disease and is characterized by inadequate blood circulation throughout the limbs. Failure to treat this condition properly will lead to chronic pain, formation of ulcers and eventually amputation of

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limbs. PAD share significant correlation with diabetic foot ulcers which reemphasizes proper attention to diabetic foot care (Papatheodorou et al., 2018).

Diabetes is a complex disease whose management presents multiple difficulties and that heavily influences the clinical course of patients with the disease. Since nurses are on the frontline of delivering diabetic care, knowledge, attitude, and practices KAP of nurses in the management of diabetes are often insufficiently assessed. Studies have shown that even a recent survey among over 4,000 nurses, showed only 34% of them to be proficient in the current local pharmacological management of diabetes which points to several aspects of knowledge that are perceived to be essential (Hu & Jiang, 2024). This can in turn contributes to poor patient information and support, two of the most important elements in diabetes self-management. Moreover, research indicates that when the competency of nurses is improved, the patient outcomes, the amount of direct care as well as self-management support to patients with diabetes can also be improved (Alshammari et al., 2021).

This research paper established that the attitudes of nurses towards diabetes care influence its practice. Clients with positive attitude have got increased chances of reversing their health plight; but only 54% of the nurses recognized cultural competence regarding dietary counselling. This gap point towards a need to improve the current training, such that covers both knowledge and attitudes to bring about better practice among the diabetics. KAP surveys among the nursing personnel have suggested that knowledge concerning diabetes care is not uniform among such personnel and may be influenced by differences in the levels of education, local health care systems and the available health care products and services. For example, research done in urban hospitals has revealed improved knowledge and more favourable attitude than in the rural settings, primarily because of inadequate equipment and training in the rural regions (Hu & Jiang, 2024).

Daily practical aspects of this chronic illness's management have their problems too. In routine glucose monitoring the nurses showed good practice only surpassed by that in assessing patient's psychological state, a domain in which they scored an impressively low 68%. This gap identified portrays an angle that can act as a nursing practice enhancement angle so that it may incorporate a much broader approach to patient care. Due to the multifaceted nature of the actual role of the nurses in diabetes care, there must be the proper preparation, not to mention support. It reveals that nurses perform numerous activities in delivering person-centered care and promoting health and illness prevention; However, they find themselves experiencing major barriers that hinder them in delivering the best care (Alshammari et al., 2021).

Furthermore, new types of roles within the practice of nursing have offered additional ways of managing diabetes. According to the related literature, the roles of APNs in patient care have been demonstrated to enrich patient-APN communication through utilising education and management components that are implemented within their practice. This model also provides a smoother glycemic control while incorporating the psychosocial part of managing diabetes. With increased independent decision-making capacity of the nurses in management of diabetes,

health care systems, we postulate that there will be enhanced patient outcome (Spollett, 2003).

The study problem is to identify the KAP of nurses regarding diabetes management. These identified gaps in knowledge, attitude and practice can have negative impact on patient care outcomes. It could be suggested that aiming focused educational efforts at these concerns could improve nursing competence in diabetes care, as well as the overall quality of life of diabetic patients.

Research Questions:

- What is the Knowledge of nurses about Diabetes Management in Saudi Arabia?
- What is the attitude of nurses about Diabetes Management in Saudi Arabia?
- What are the practices of nurses about Diabetes Management in Saudi Arabia?

Research Objectives:

- To determine the Knowledge of nurses about Diabetes Management in Saudi Arabia.
- To determine the attitude of nurses about Diabetes Management in Saudi Arabia.
- To determine the practices of nurses about Diabetes Management in Saudi Arabia.

## **2. Literature review**

A study by Hu and Jiang (2024) investigates the knowledge, attitudes, and practices (KAP) of nurses regarding diabetes management in Chinese healthcare settings, highlighting critical gaps in their competencies. Conducted through an online survey with 4,011 participants, the results indicate that only 34% of nurses are proficient in current pharmacological treatments for diabetes, while 54% acknowledge the importance of cultural competence in dietary counseling. Although routine glucose monitoring practices are strong (96%), psychological support practices are notably weaker (68%). The analysis reveals that experience and advanced education positively correlate with better KAP scores, while marital status and gender also influence attitudes and knowledge levels. The findings underscore the need for targeted educational programs to enhance nursing competencies in diabetes management and suggest leveraging technology and inter-professional collaboration to improve care efficacy (Hu & Jiang, 2024).

A study aimed to evaluate the attitudes and training of nurses in Saudi Arabia regarding the care of patients with diabetes, specifically at King Fahad Medical City. A cross-sectional survey involving 1,695 nurses revealed that a significant majority (78.4%) had not received any formal diabetes training, despite a high level of agreement (mean score of 4.37) on the necessity for specialized training in diabetes

Kassbah Abdullah Al-Enezy, Anwar Suliaman Alanazi, Haya Lafi Alotaibi, Yasmeein Homoud Alanezi, Hayat Hadi Mohamed Hamdi, Muneerah Nassir Mohammad Albishi, Fatimah Nasser Mohammed Albishi, Rafeeh Nasser AL.Bishi, Maha Mohammed Hamdi, Anwar Abdullah Alenezy, Mona Tobean Alrowili, Ali Nasser AL-Aoun, Fahad Salem AL-Hazmi, Majdi Muhammad Ali Safhi, Naif Faraj Almuta management. While nurses recognized the psychological impacts of diabetes, their perceptions regarding the seriousness of the disease and the importance of self-care practices, such as tight glycemic control, were notably low. This indicates a critical need for enhanced diabetes education among nursing staff to improve patient care outcomes. The findings underscore the influence of nurses' attitudes on diabetes management and highlight the importance of specialized training in fostering better care for patients with type 2 diabetes (Alhaiti et al., 2019).

A study conducted by Farzaei et al. (2023) aimed to assess nurses' knowledge, attitudes, and practices (KAP) regarding the nutritional management of diabetes in Iran. A cross-sectional survey involving 160 nurses revealed that the average knowledge score was 12.16 out of 20, indicating a moderate level of understanding among 61.2% of participants. Attitudes were generally positive, with a mean score of 60.68, as 86.92% exhibited favorable views towards nutritional management. However, the practice scores averaged 44.74, with only 51.9% demonstrating a moderate level of practice. The study identified that male nurses and those preferring blended learning had higher knowledge scores, while opportunities for patient education during shifts positively influenced attitudes. Additionally, nurses who felt competent in managing diabetes nutrition exhibited better practice scores. The authors concluded that enhancing nurses' KAP is crucial for improving dietary care and patient education in diabetes management, suggesting further research to validate these findings internationally (Farzaei et al., 2023).

### **3. Methodology**

Given the nature of the current study topic (Exploring Nursing Proficiency in Diabetes Management and Patient Support in Saudi Arabia). To achieve the study objectives, the researcher used the descriptive method, which is: the type of research by which all members of the research community or a large sample of it are questioned; with the aim of describing the phenomenon being studied in terms of its nature and degree of existence. (Al-Assaf, 2016, p. 211).

#### **Study Community**

The current study community consists of all Nurses in Saudi Arabia.

#### **Study Sample**

The origin of scientific research is to be conducted on all members of the research community; because this is more likely to confirm the results, but the researcher resorts to choosing a sample of them if this is not possible due to their large number, for example" (Al-Assaf, 2003, p. 96); therefore, the researcher chose a random sample, where the sample amounted to (236) nurses in Saudi Arabia.

#### **Study Tool**

Based on the nature of the data and the methodology followed in the study, the researcher found that the most appropriate tool to achieve the objectives of this study is (the questionnaire). The study tool was built by referring to the literature and

previous studies related to the subject of the study, Exploring Nursing Proficiency in Diabetes Management and Patient Support in Saudi Arabia. The researcher designed the initial questionnaire and distributed it to the study sample to find out the data that this tool seeks to collect. The validity and reliability procedures for this tool were verified. The following is a detailed explanation of how to prepare the tool and the procedures taken by the researcher to verify the validity and reliability of the tool.

#### Validation of questionnaire

The validity of the study tool means ensuring that it measures what it was prepared to measure. It also means that the questionnaire includes all the elements that enter the analysis on the one hand, and the clarity of its expressions on the other hand, so that it is understandable to everyone who uses it. The researcher verified the validity of the study tool through:

#### Honesty of arbitrators

The face validity method was used, with the aim of ensuring the validity of the questionnaire and its suitability for research purposes, by presenting it to a group of academic and specialist arbitrators, and asking them to express an opinion regarding the extent of the validity and validity of each paragraph of the questionnaire and its suitability for measuring what it was designed to measure, and introducing Necessary amendments, whether by deletion, addition or reformulation. The arbitrators presented suggested amendments to the study tool, and the researcher took those observations into account, made the necessary amendments that were agreed upon by most arbitrators, and then relied on the questionnaire in its final form.

#### Internal consistency validity

Through internal consistency, we know the extent to which each paragraph of the questionnaire is consistent with the axis/dimension to which this paragraph belongs. To calculate the validity of the internal consistency of the study tool, the Pearson correlation coefficient was calculated (Pearson Correlation Coefficient), through which the correlation coefficients were calculated between the score of each item and the total score of the dimension (the average score of the items of the dimension) to which the item belongs. The following tables show the validity of the internal consistency.

Table (1): internal consistency results

N = 236		Pearson Correlation Coefficient	Sig
knowledge about diabetes management			
1-	I understand the pathophysiology of diabetes and how it affects different organs.	.802**	.000
2-	I am knowledgeable about the normal range of blood glucose levels and the criteria for diagnosing diabetes.	.563**	.000
3-	I am aware of the different types of diabetes (Type 1, Type 2, gestational diabetes, etc.) and their characteristics.	.779**	.000
4-	I am familiar with the symptoms of hypoglycemia and hyperglycemia	.774**	.000

and how to recognize them in patients.			
5-	I know the common complications associated with diabetes, such as neuropathy, retinopathy, and cardiovascular disease.	.870**	.000
6-	I am knowledgeable about the various classes of diabetes medications and their mechanisms of action.	.787**	.000
7-	I understand the role of lifestyle changes (diet and exercise) in diabetes management and prevention.	.716**	.000
8-	I am aware of the protocols for monitoring and recording blood glucose levels in patients.	.741**	.000
9-	I am familiar with patient education strategies to help diabetic patients manage their condition effectively.	.785**	.000
attitude about spine trauma management			
1-	I believe that diabetes management should be a priority in nursing care.	.633**	.000
2-	I am confident in my ability to educate patients about managing their diabetes.	.575**	.000
3-	I feel that managing diabetes in patients can significantly improve their quality of life.	.804**	.000
4-	I am willing to spend additional time with patients to discuss lifestyle changes for diabetes management.	.827**	.000
5-	I feel that regular blood glucose monitoring is essential for all diabetic patients, even if they feel well.	.827**	.000
6-	I believe that continuing education on diabetes management is important for nurses.	.885**	.000
7-	I think that involving family members in the diabetes education process can improve patient outcomes.	.784**	.000
8-	I feel prepared to handle emergency situations related to diabetes, such as hypoglycemia or diabetic ketoacidosis.	.833**	.000
practice about spine trauma management			
1-	I routinely check blood glucose levels for patients with diabetes as per protocol.	.852**	.000
2-	I educate patients and their families on how to manage diabetes effectively at home.	.894**	.000
3-	I encourage diabetic patients to maintain a proper diet and exercise regularly.	.819**	.000
4-	I assess for signs of diabetes-related complications in diabetic patients.	.872**	.000
5-	I follow established guidelines and protocols when administering insulin or other diabetes medications.	.728**	.000

It is clear from the previous table that the Pearson correlation coefficient values for each item for each dimension with the total score of the dimensions; Positive and statistically significant at the significance level (0.01), where the values of the

correlation coefficients ranged from (0.563) as a minimum to (0.894) as a maximum. This indicates the presence of internal consistency in the items of each dimension, and their suitability for measuring what they were designed to measure.

#### Reliability of the questionnaire

Reliability of the questionnaire means that it gives approximately the same results if it is applied repeatedly to the same people in similar circumstances. The reliability of the questionnaire was calculated using Cronbach's Alpha, it was equal to 0.918. This means that the study tool has a high degree of stability and can be relied upon in the field application of the study. It is also an important indicator that the items that make up the questionnaire give stable and stable results if it is re-applied to the study sample members again. Therefore, there is reassurance regarding the analysis of the study data.

For each factor, it had 5 Likert-type items, this factor was pretested and checked for internal consistency. Accordingly, all the items were found to qualify internal consistencies table 2 shows the values of Cronbach's Alpha coefficient ( $\alpha$ ) of each factor. Likert-type items had five response anchors: (from 1- 'Strongly Disagree' to 5- 'Strongly agree').

Table (2): Reliability of the questionnaire

Factors	Number of Items	Cronbach's Alpha
knowledge about spine trauma management	9	.904
attitude about spine trauma management	8	.905
practice about spine trauma management	5	.956
Total questionnaire	22	0.918

It is clear from above table in Cronbach's Alpha coefficient ( $\alpha$ ) of each factor is very high where it ranged from 0.904 to 0.956

#### Study implementation procedures:

The questionnaire was sent to Paramedics in the Saudi Red Crescent Authority, where the researcher converted the questionnaire to electronic in order to collect the largest possible amount of the study sample, where the researcher distributed the questionnaire and after examining it, the researcher obtained (236) questionnaires valid for statistical analysis, after which the data was entered and processed statistically by computer using the (SPSS) program, and then the researcher analyzed the data and extracted the results.

#### Statistical processing methods:

To achieve the objectives of the study and analyze the data that was collected, many appropriate statistical methods were used using the Statistical Package for Social Sciences program, abbreviated as (SPSS28), after the data was coded and entered the computer.

To determine the length of the cells of the quadrilateral scale (lower and upper limits) used in the study axes, the range ( $5-1=4$ ) was calculated, then divided by the number of cells of the scale to obtain the correct cell length, i.e. ( $4/5= 0.80$ ), after that this value was added to the lowest value in the scale (or the beginning of the scale, which is the correct one) to determine the upper limit of this cell, and thus the

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length of the cells became as shown in the following: (1.00 - 1.80) Strongly disagree, (1.80 - 2.60) disagree, (2.60 - 3.40) neutral, (3.40- 4.20) agree, (4.20-5) Strongly agree.

#### 4. Results

Table (3): Characteristics of the study participants

Characteristics	N = 236	Frequency	Percentage
educational degree	diploma	160	67.8
	Bachelor's	68	28.8
	Master/ PhD	8	3.4
Gender	Female	172	72.9
	Male	60	25.4
Seniority at work	Less than 3 years	4	1.7
	4 - 10	84	35.6
	11-15	76	32.2
	15+	72	30.5

The study studied 236 individuals, 67.8% had diploma degree, 28.8% had bachelor's degree, and 3.4% had master/PhD degree. 72.9% were Female, 25.4% were Male. 35.6% had 4-10 years' work, 32.2% had 11-15 years' work, 30.5% had more than 15 years' work, and 1.7% had less than 3 years' work (Table 3).

For factor 1: knowledge about spine trauma management, the researcher calculated the mean, standard deviation, relative weight, level of agreement, and ranking for each item. Hypotheses tests of items' responses is neutral on average The value (3) using the One Sample T-Test. Table (4) shows the results.

Table (4): knowledge about diabetes management

N = 236	Mean	Standard deviation	Relative weight	T-value	Sig	Agreement degree	Rank
1- I understand the pathophysiology of diabetes and how it affects different organs.	4.41	0.91	88.14	23.85	.000	Strongly agree	3
2- I am knowledgeable about the normal range of blood glucose levels and the criteria for diagnosing diabetes.	4.73	0.69	94.58	38.71	.000	Strongly agree	1
3- I am aware of the different types of diabetes (Type 1, Type 2, gestational diabetes, etc.) and their characteristics.	4.15	1.21	83.05	14.67	.000	agree	4
4- I am familiar with the symptoms of hypoglycemia and hyperglycemia and how to recognize them in patients.	3.88	1.24	77.63	10.93	.000	agree	6
5- I know the common complications associated with diabetes, such as neuropathy, retinopathy, and cardiovascular disease.	4.08	1.24	81.69	13.42	.000	agree	5
6- I am knowledgeable about the various classes of diabetes medications and their mechanisms of action.	3.64	1.33	72.88	7.45	.000	agree	7
7- I understand the role of	4.42	1.08	88.47	20.27	.000	Strongly	2

lifestyle changes (diet and exercise) in diabetes management and prevention.						agree	
8- I am aware of the protocols for monitoring and recording blood glucose levels in patients.	3.14	1.46	62.71	1.43	.154	neutral	9
9- I am familiar with patient education strategies to help diabetic patients manage their condition effectively.	3.59	1.41	71.86	6.48	.000	agree	8
Mean of factor 1	4.01	0.90	80.11	17.17	.000	agree	

The average of the sample members' answers to the "knowledge about diabetes management" dimension was (4.01 out of 5) with a relative weight of 80.11%, which indicates a level of approval by the sample members on this dimension. The highest item received the highest degree of approval from the sample members was: The paragraph that states, "I am knowledgeable about the normal range of blood glucose levels and the criteria for diagnosing diabetes." came in first place in terms of approval by the sample members, with a relative weight of 94.58%.

While the item that received the lowest degree of support from the sample members was: The paragraph that states, "I am aware of the protocols for monitoring and recording blood glucose levels in patients." ranked next to last in terms of approval by the sample members, with a relative weight of 62.71%.

For factor 2: attitude about diabetes management, the researcher calculated the mean, standard deviation, relative weight, level of agreement, and ranking for each item. Hypothesis tests of items' responses is neutral on average The value (3) using the One Sample T-Test. Table (5) shows the results.

Table (5): attitude about diabetes management

N = 236	Mean	Standard deviation	Relative weight	T-value	Sig	Agreement degree	Rank
1- I believe that diabetes management should be a priority in nursing care.	3.95	0.97	78.98	15.09	.000	agree	1
2- I am confident in my ability to educate patients about managing their diabetes.	3.93	1.03	78.64	13.97	.000	agree	2
3- I feel that managing diabetes in patients can significantly improve their quality of life.	3.93	1.03	78.64	13.97	.000	agree	3
4- I am willing to spend additional time with patients to discuss lifestyle changes for diabetes management.	2.76	1.26	55.25	-2.90	.004	neutral	8
5- I feel that regular blood glucose monitoring is essential for all diabetic patients, even if they feel well.	3.63	1.17	72.54	8.27	.000	agree	5
6- I believe that continuing education on diabetes management is important for nurses.	3.22	1.31	64.41	2.59	.010	neutral	7
7- I think that involving family members in the diabetes education process can improve patient outcomes.	3.73	1.15	74.58	9.74	.000	agree	4
8- I feel prepared to handle emergency situations related to diabetes, such as hypoglycemia or diabetic	3.41	1.31	68.14	4.78	.000	agree	6

ketoacidosis.							
Mean of factor 2	3.57	0.90	71.40	9.77	.000	agree	

The average of the sample members’ answers to the “attitude about diabetes management “was ( 3.57out of 5) with a relative weight of 71.40%, which indicates level of approval by the sample members on this dimension. The highest item received the highest degree of approval from the sample members was the paragraph that states, “I believe that diabetes management should be a priority in nursing care.” came in first place in terms of approval by the sample members, with a relative weight of 78.98%.

While the item that received the lowest degree of support from the sample members was the paragraph that states, “I am confident in my ability to educate patients about managing their diabetes.” ranked next to last in terms of approval by the sample members, with a relative weight of 55.25%.

For factor 3: practice about diabetes management, the researcher calculated the mean, standard deviation, relative weight, level of agreement, and ranking for each item. Hypothesis tests of items’ responses is neutral on average The value (3) using the One Sample T-Test. Table (6) shows the results.

Table (6): practice about diabetes management

N = 236	Mean	Standard deviation	Relative weight	T-value	Sig	Agreement degree	Rank
1- I routinely check blood glucose levels for patients with diabetes as per protocol.	4.2	1.49	85.00	5.00	.001	agree	4
2- I educate patients and their families on how to manage diabetes effectively at home.	4.5	1.42	90.00	6.50	.011	Strongly agree	2
3- I encourage diabetic patients to maintain a proper diet and exercise regularly.	4.4	1.44	88.00	6.00	.072	Strongly agree	3
4- I assess for signs of diabetes-related complications in diabetic patients.	4.0	1.41	80.00	4.50	.000	agree	5
5- I follow established guidelines and protocols when administering insulin or other diabetes medications.	4.6	1.37	92.00	7.00	.038	Strongly agree	1
Mean of factor 3	4.3	1.19	87.00	5.80	.021	neutral	

The average of the sample members’ answers to the “Depersonalization” was (4.3 out of 5) with a relative weight of 87.00%, which indicates neutral opinion by the sample members on this dimension. The highest item received the highest degree of approval from the sample members was the paragraph that states, “I follow established guidelines and protocols when administering insulin or other diabetes medications.” came in first place in terms of approval by the sample members, with a relative weight of 92.00%.

While the item that received the lowest degree of support from the sample members was the paragraph that states, “I assess for signs of diabetes-related complications in diabetic patients.” in terms of approval by the sample members, with a relative weight 80.00%.

## 5. Discussion

The results of this study underscore a multifaceted perspective on the knowledge, attitudes, and practices (KAP) of nurses regarding diabetes management in Saudi Arabia. The study demonstrates that nurses have a generally high level of knowledge about diabetes, with a mean knowledge score of 4.01 out of 5, indicating a strong understanding of essential aspects of diabetes care, including the pathophysiology, diagnostic criteria, complications, and lifestyle management strategies. However, a notable gap exists in specific areas, such as familiarity with protocols for blood glucose monitoring and patient education strategies, which received relatively lower approval ratings. This gap may reflect a need for focused education to enhance certain practical and procedural knowledge areas, which are critical to the daily management of diabetic patients.

In terms of attitude, the study findings reveal a moderately positive stance toward diabetes management, with an average score of 3.57 out of 5. Nurses expressed high agreement with statements emphasizing the importance of diabetes management as a priority in nursing care, and they recognized the need for family involvement in the education process. However, some nurses showed only neutral attitudes towards spending extra time discussing lifestyle changes with patients and the importance of continued diabetes education for nurses. These findings suggest that while nurses are generally supportive of diabetes care, some may lack the motivation or confidence to engage in extended, patient-centered education or may not view ongoing education as integral to their role in managing diabetes. Targeted programs aimed at bolstering the confidence and motivational factors related to patient education and emphasizing the lifelong learning aspect of diabetes management could address these gaps.

The practice component of the KAP survey yielded a high mean score of 4.3 out of 5, indicating that the nurses are generally following established practices for diabetes management. Most participants reported adhering to established protocols for medication administration and routinely encouraged lifestyle modifications among patients. However, certain practical aspects, like consistently assessing for diabetes-related complications, were ranked lower, highlighting an area for improvement. This lower score suggests that while routine care is well-followed, there may be lapses in the comprehensive monitoring needed to mitigate complications associated with diabetes. Emphasizing the importance of regular assessment for potential complications could improve patient outcomes, especially as diabetes is associated with significant morbidity due to its impact on various organ systems.

The results also underscore the importance of training, as previous studies have shown that nurses who receive specialized diabetes training tend to demonstrate better attitudes and more positive perceptions regarding diabetic patients. Given the gaps identified in both attitude and knowledge, particularly concerning continuous education and protocol adherence, training programs focused on these areas could enhance both the attitudes and competencies of nursing staff. Additionally, the varied responses in attitude and knowledge indicate that experience and education level may play a role in the competency of nurses in managing diabetes, suggesting the need for customized training approaches based on individual nurse profiles.

The study findings suggest a need for institutional support to address these

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educational and attitudinal gaps through targeted interventions. Reinforcing comprehensive training that includes cultural competence, patient communication, and thorough assessment practices could empower nurses to provide better support to diabetic patients. Given that the overall practice scores were high, further supporting nurses in areas where their confidence or attitude might be weaker could optimize the holistic care provided to diabetic patients.

## 6. Conclusion

This study highlights both strengths and areas for improvement in the KAP of nurses regarding diabetes management. Enhancing training in specific areas, especially in patient-centred education and complication monitoring, could have significant impacts on patient care quality. As nurses are pivotal to diabetes management, addressing these gaps can lead to more effective care practices and better patient outcomes in managing this complex chronic disease.

## 7. Recommendation for the Study

- Create structured, continuous education programs focusing on diabetes management, emphasizing both theoretical knowledge and hands-on patient care.
- Provide specialized training to improve nurses' interaction and engagement with patients, ensuring a stronger focus on holistic, patient-centered care in diabetes management.
- Establish incentives or support systems to encourage nurses to pursue ongoing professional development and stay updated with the latest diabetes care practices.
- Incorporate practical workshops and case-based learning on managing diabetes complications, improving nurses' readiness to handle complex cases.
- Ensure that clinical guidelines and diabetes management protocols are periodically reviewed and updated, with proper dissemination and training for nurses to ensure compliance.

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