Identification of Factors Associated with Self-awareness among Diabetic Patients Attending AlZaher Primary Health Care Center in Makkah AlMukarramah City 2024

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Abstracts

Background: The prevalence of diabetes is rising worldwide, especially in poorer nations. It is anticipated to emerge as the sixth main cause of mortality globally by 2030. The factors linked to self-awareness in diabetes patients are still debated.

Aim: To identify factors associated with self-awareness among diabetic patients attending Al-Zaher primary health care center (PHCC), Makkah Almukaramah City, Saudi Arabia 2024

Methods: A cross-sectional study was performed using a randomized sample of diabetes patients visiting Al-Zaher Primary Health Care Center in Makkah AlMukarramah city. The used questionnaire included demographic information and data on the patient's beliefs and attitudes toward diabetes mellitus (DM). The statistical analysis was conducted using SPSS. A P-value below 0.05 was deemed significant.

Results: The study included 523 patients with T2DM in different genders, age categories from 20 to 70 years and education levels. The majority of respondents were married (79.3%). 53.5% of respondents were fully informed of their health conditions, however 52% were not confident in managing their diabetes. 60% of patients stated that regular diabetic follow-up every one to two months would assist in maintaining their health. 50.7% of respondents said there is a significant likelihood of getting diabetic issues in the future. While 50.9% of respondents felt that diabetes may be remedied with medicine, 47% of them thought that those with diabetes would have a shorter lifespan compared to those without the condition. 48% of patients selected meals optimal for their health, whereas 51.6% engaged in exercise at least three times weekly to enhance blood glucose regulation. Nonetheless, 51.1% of them sometimes missed doses of diabetic medicine. The average total score of patients' self-awareness about diabetes mellitus was 6.8±3.9, with a median of 8 (range 1-13).

Conclusion: The study found inadequate self- awareness among diabetic patients. Male gender, younger age and high education level are the significant factors associated with high self-awareness toward DM. The study highlights the need for educational programs to improve self-awareness and empower patients, especially females, older individuals, and those with lower education levels, in Saudi Arabia.

Keywords: self-awareness, type 2 diabetes, Makkah Almukawamah, Saudi Arabia.

1. Introduction

Diabetes is becoming more commonplace globally, particularly in developing countries. By 2030, it is predicted to be the seventh leading cause of death worldwide [1]. 79% of adult diabetes diagnoses occur in low- and middle-income nations, according to recent data from the International Diabetes Federation (IDF). According to the IDF, up to 90 million people, or 1 in 11, have diabetes. If prompt action is not taken, the number of adults with diabetes is expected to rise to 643 million by 2030 and 783 million by 2045. This translates to more than 10 million cases a year or about three new cases every ten seconds. According to the IDF, about 187 million people do not know whether they have diabetes [2, 3].

One in nine people in the Middle East and North Africa region suffers from diabetes. 34 million people in the 20–79 age group, or 10.9% of the population, had a diabetes diagnosis in 2012; this number is expected to rise during the next 20 years. The highest rates of diabetes are seen in four of the top 10 countries in the world [3]. Diabetes affected 23.4% of Saudi Arabians between the ages of 20 and 79. It is thought to have the seventh-highest prevalence of diabetes worldwide [4]. Complications from diabetes have a significant role in death, reduced quality of life, and

disability. Diabetes complications may affect many body systems and manifest differently in each person [5].

There are no internationally accepted standards for identifying and evaluating diabetes complications. Comparing different groups is difficult since different approaches are used to detect these problems. However, they are common; a considerable proportion of patients (50 percent or more in some studies) had at least one complication at diagnosis [6]. Adequate blood glucose control in diabetes may prevent or delay complications, according to the results of the Diabetes Control and complications Trial. Both Type 1 Diabetes Mellitus (T1DM) and Type 2 Diabetes Mellitus (T2DM) have shown this [7].

A1C and patient self-monitoring of blood glucose (SMBG) are the two main methods that patients and healthcare professionals may use to evaluate how well the treatment strategy is affecting glycemic control [8]. Even yet, hemoglobin A1C is the gold standard for tracking glycemic management and acts as a stand-in for problems associated with diabetes. It doesn't tell you about daily fluctuations in blood sugar levels [9].

Due to its ability to identify glycemic excursions and differentiate between preprandial, postprandial, and fasting hyperglycemia, self-monitoring of blood glucose is a crucial supplement to A1C. Recognize hypoglycemia, help track its resolution, and promptly inform patients about how their medication, meal choices, and level of exercise affect their glycemic control [10–12]. Therefore, this study aimed to identify the factors associated with self-awareness among diabetic patients attending Al-Zaher Primary Health Care Center in Makkah AlMukarramah City in 2024.

Aim of Work:

To identify the factors associated with Self-awareness among diabetic patients attending Al-Zaher Primary Health Care Center in Makkah AlMukarramah City 2024.

2. METHODS:

A cross-sectional study was conducted in Makkah AlMukarramah, the capital of the Makkah governorate in Saudi Arabia and a city in the Hijaz. Standing 277 meters above sea level, it is located in a narrow valley. The number of pilgrims during the Hajj season, which takes place in the twelfth Muslim lunar month of Dhu al-Hijjah, more than doubled the city's permanent population of 1.9 million in 2020 [13]. The Joint Commission International (JCI) accredited AlZaher PHC on June 26, 2012, making it one of the 85 primary health care centers (PHCs) in Makkah AlMukarramah that is recognized as a training site for the family medicine board [14]. It had emergency rooms, various clinics, including clinics for people with diabetes.

This study, which focused on randomized data collection from diabetic patients enrolled at Alzaher PHCC, was carried out over the course of one month in October 2024. After being developed in English and validated in a Malaysian study, the questionnaires were translated into Arabic and distributed to all diabetes patients who spoke Arabic as part of the present study.

There were two parts on the questionnaires:

Demographic data, such as gender, age, marital status, and level of education, were collected in the first part. Diabetes patients' health, beliefs, attitudes, and behaviors were assessed in the second section in the manner described below. Using phone numbers acquired from Alzaher PHCC, questionnaires were sent via WhatsApp to diabetic patients until the necessary sample size was reached. Out of 800 diabetic patients, 522 replied and gave the lead investigator their information for biostatistical evaluation.

Ethical considerations:

Approval was taken from research administration of ministry of health in Makkah Almukarramah region, and diabetic patients in this study. All collected data in questionnaires will be kept confidential. All the participants were informed of the study and its objectives.

Statistical Analysis:

SPSS version 26 was used to input, code, and analyze the gathered data. Numbers and percentages representing descriptive statistics were used to depict the data. The Pearson Chi-square test was used to report inferential statistics. P-values were considered significant if they were less than 0.05.

3. RESULTS:

Table 1: Sociodemographic characteristics of diabetic patients

		n	%
sex	Female	250	47.8%
	Male	273	52.2%
age	20 - 30	34	6.5%
	31 -40	65	12.4%
	41 - 50	119	22.8%
	51 - 60	193	36.9%
	61 - 70	112	21.4%
Education level	Illiterate \primary	28	5.4
	Secondary	173	33.1
	Average	45	8.6
	university	222	42.4
	Master\ Doctor degree	55	10.5
Marital status	single	108	20.7%
	Married	415	79.3%

Table 1 shows the sociodemographic characteristics of diabetic Patients attending Al-Zaher Primary Health Care Center in Makkah AlMukarramah city. The study included 522 patients with type 2 diabetes mellitus (T2DM) in different genders and age categories from 20 to 70 years. The education levels were varied among the participants; 42.4% had university education and 33.1% had secondary education. The majority of respondents were married (79.3%)

Figure 1: Age and sex distribution of the study sample.

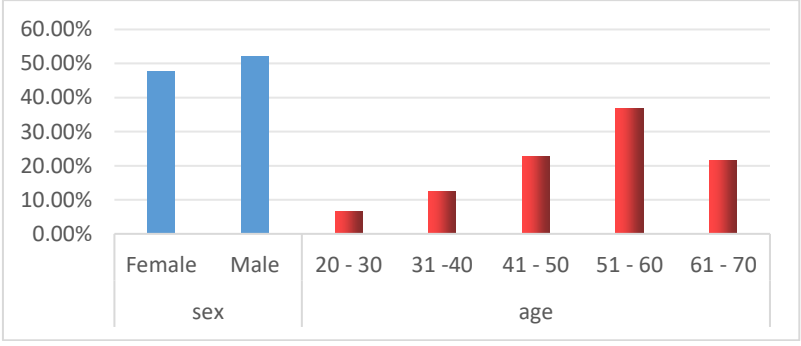

Figure 1 shows that, out of 523 diabetic patients included in the study, 52.2% were males and 47.8% were female. The age categories were varied from 20 to 70 years; the most common category was 51-60 (36.9%), followed by 41-50 (22.8%) and 61-70 (21.4%). However, 12.4% of patients aged between 31-40 years and only 6.5% aged between 20-30 years.

Figure 2: Education level distribution of the study sample.

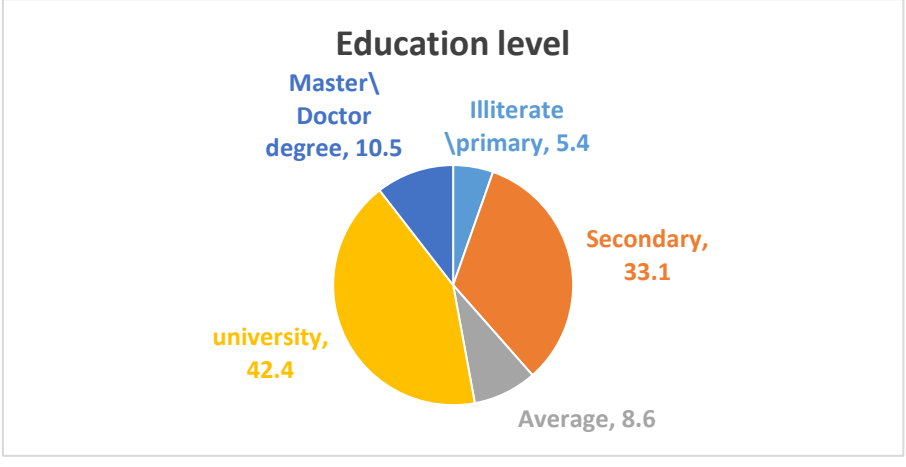

Figure 2 shows that the education levels was varied among the included diabetic patients. The most common education was university education (42.4%), followed by secondary education (33.1%). 10.5% of patients had Master or Doctor degree, 8.6% were average and only 5.4% of them were Illiterate or had primary education.

Table 2: Diabetic patients' health, beliefs attitude and practice regarding diabetes and their health.

	No\don't agree		Yes\ agree	
	n	%	n	%
1- "I am fully informed of my health conditions"	243	46.5%	280	53.5%
2- "At present, I am still not confident in managing my diabetes"	251	48.0%	272	52.0%
3- "A routine follow-up for my diabetes every 1 or 2 months would help me to stay healthy"	209	40.0%	314	60.0%
4- "There is a high possibility of me developing diabetes complications in future*"	258	49.3%	265	50.7%
5- "It is difficult for me to find the time to go to the doctor for my diabetes follow-up*"	335	64.1%	188	35.9%
6- "I receive satisfactory emotional support from family and friends"	247	47.2%	276	52.8%
7- "I need further help and information for my diabetes"	285	54.5%	238	45.5%
8- "Diabetes patients have a strong chance of experiencing medical problems*"	220	42.1%	303	57.9%
9- "There is a high possibility that diabetes patients will die earlier than others without diabetes*"	277	53.0%	246	47.0%
10- "I am able to choose foods that are best for my health"	272	52.0%	251	48.0%
11- "I do miss some doses of diabetes medication at times"	256	48.9%	267	51.1%
12- "Diabetes can be cured by taking medication"	266	50.9%	257	49.1%
13- "I could exercise at least 3 times a week to improve my blood glucose control"	253	48.4%	270	51.6%
Total score Mean± SD	6.8±3.9			
Median (range	8(1-13)			

Table 2 shows diabetic patients' health, beliefs attitude and practice regarding diabetes and their health. More than one-half of patients (53.5%) were fully informed of their health conditions, however 45.5% of them need further help and information for diabetes and 52% were not confident in managing their diabetes (52%).

Regarding diabetic patients' beliefs regarding diabetes and their health, 60% of patients believed that the routine follow-up of diabetes every 1 or 2 months would help them to stay healthy. About one-half (50.7%) of respondents though that there is a high possibility of them developing diabetes complications in future. The majority of patients believed that they have a strong chance of experiencing medical problems (57.9%). Although, 50.9% of respondents believed that diabetes can be cured by taking medication, 47% of them though that diabetes patients will die earlier than others without diabetes.

35.9% of patients stated that "It is difficult for me to find the time to go to the doctor for my diabetes follow-up". 52.8% of participants were receiving satisfactory emotional support from family and friends.

Regarding the attitude and the practice of respondents, 48% of patients were able to choose foods that are best for their health and 51.6% of them do exercise at least 3 times a week to improve my blood glucose control. However, 51.1% of them missed some doses of diabetes medication at times.

The mean total score of patient's self-awareness toward diabetes mellitus was 6.8±3.9 and the median was 8(1-13).

Figure 3: Diabetic patients' health, beliefs attitude and practice regarding diabetes and their health.

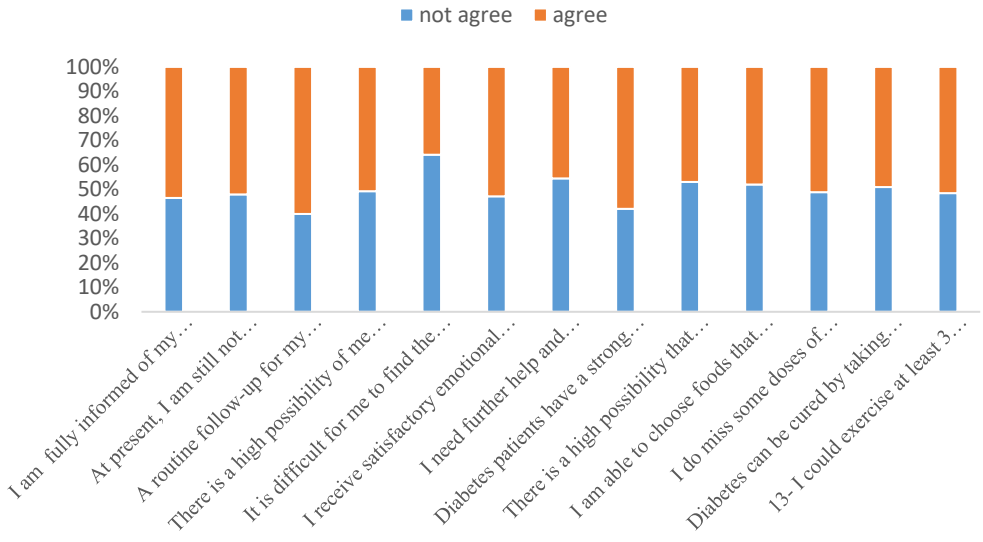

Figure 3 shows diabetic patients' beliefs attitude and practice regarding diabetes. 53.5% were fully informed of their health conditions, however 45.5% of them need further help and awareness for diabetes and 52% were not confident in treating their diabetes (52%).

60% of respondents believed that the routine follow-up of diabetes every 1 or 2 months would help them to stay healthy. 50.7% of them though that there is a high possibility developing diabetes complications in future. 57.9% of participants believed that they have a strong chance of experiencing medical problems. Although, 50.9% of participants though that diabetes can be cured, 47% of them believed that diabetes patients will die earlier than others without diabetes.

48% of patients were able to choose foods that are best for their health and 51.6% of them do exercise at least 3 times a week to improve my blood glucose control. However, 51.1% of them missed some doses of diabetes medication at times.

Table 3: Relation of awareness score of diabetic patients with sociodemographic character.

		score				
		Mean	SD	Median	Range	P value
sex	Female	5.07	3.67	3.00	1.0-12	<0.001
	Male	8.48	3.40	10.00	2.0-13	
age	20 - 30	9.38	1.71	9.50	5-12	<0.001
	31 -40	9.00	2.77	10.00	2-13	
	41 - 50	7.97	3.55	9.00	1-12	
	51 - 60	6.26	4.04	6.00	2.-13	
	61 - 70	4.66	3.74	2.00	1.-12	
Education	Illiterate \primary	2.43	1.45	2.00	1.-8	<0.001
	Secondary	4.45	3.36	2.00	1.-13	
	Average	3.51	3.18	2.00	1-12	
	university	9.25	2.66	10.00	2.-12	
	Master\ Doctor degree	9.69	2.16	10.00	4-13	
marital	Single	6.75	3.66	8.00	2.-13	0.76
	Married	6.88	3.99	8.00	1.-13	

Table 3 shows the factors associated with self-awareness among diabetic patients. Gender was significant factors (P<0.001) associated with self-awareness among diabetic patients. Male diabetic patients had significantly higher self-awareness (8.48±3.40) than female patients (5.07±3.67) toward DM.

Age was significant factors (P<0.001) associated with self-awareness among diabetic patients. The high self-awareness was more prevalent in the lower age categories; diabetic patients aged between 20- 30, had the highest mean self-awareness score (9.38±1.71), followed by patients aged between 31 -40 had the total mean self-awareness score (9.00±2.77).

In addition, education level was significant factors (P<0.001) associated with self-awareness among diabetic patients. In line with expectations, the highest self-awareness was found in diabetic patients who had Master\ Doctor Degree (9.69±2.16) followed by diabetic patients who had university education (9.25±2.66).

However, marital status had no significant (P=0.76) effect on self-awareness among diabetic patients.

Figure 3: Self-awareness score of diabetic patients according to education level.

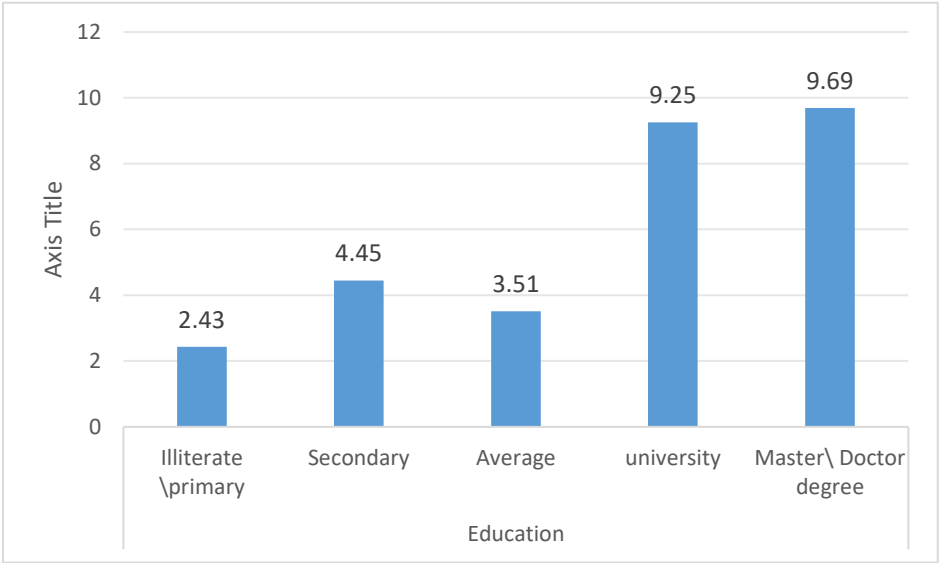

Figure 3 showed that the highest self-awareness was found in diabetic patients who had Master\ doctor degree (9.69±2.16) followed by diabetic patients who had university education (9.25±2.66). The lowest self-awareness score was found in illiterate patients or patients (2.43±1.45) who had primary education.

4. DISCUSSION:

The global burden of diabetes, particularly Type 2 Diabetes Mellitus (T2DM), is rapidly increasing, with developing countries experiencing a disproportionate rise. Self-awareness is essential for effective diabetes management, as it encompasses a patient's knowledge, attitudes, and practices concerning their condition. This study analyzed 523 T2DM patients, focusing on variables such as gender, age, education level, and marital status. The findings reveal notable gaps in self-awareness, as the average score among participants was 6.8 ± 3.9, with a median of 8.

In addition, our results found a significant gender disparity in self-awareness, with male patients scoring significantly higher (8.48 ± 3.40) than females (5.07 ± 3.67). This discrepancy could be influenced by sociocultural norms in Saudi Arabia, where men might have greater access to health education or feel more empowered to engage with healthcare services [15]. Addressing this gap requires tailored approaches to empower women in diabetes management, potentially involving community outreach and gender-sensitive educational programs.

Age emerged as a significant factor, with younger patients demonstrating higher self-awareness scores. Patients aged 20-30 had the highest scores (9.38 ± 1.71), followed by those aged 31-40

(9.00 ± 2.77). These findings suggest that younger individuals might have better access to information or are more likely to engage with technology and digital health resources [16]. However, older patients, who are at a higher risk of complications, demonstrated significantly lower awareness. Targeted interventions focusing on older populations, such as simplified educational materials or peer support groups, could bridge this gap [17].

Education was another critical determinant of self-awareness. Patients with higher education levels, particularly those with university or advanced degrees, exhibited the highest awareness scores. In contrast, illiterate patients or those with only primary education had the lowest scores. These findings align with global research indicating that higher educational attainment is associated with better health literacy and outcomes [18, 19]. To address this disparity, healthcare providers could implement simplified educational interventions, including visual aids and culturally relevant materials, to cater to less-educated populations [20].

While 53.5% of patients felt informed about their health, 52% lacked confidence in managing their condition, and 45.5% expressed a need for additional information. These statistics highlight a gap between perceived and actual self-awareness. Furthermore, 51.1% reported missing medication doses, and only 51.6% engaged in regular exercise. Comparing these findings with existing literature reveals both consistencies and disparities. For instance, a study by Marciano et al. (2019) emphasizes the critical role of health literacy in diabetes knowledge, self-care, and glycemic control. The authors found that higher health literacy levels are associated with better diabetes knowledge and self-care behaviors, leading to improved glycemic control. This aligns with the observation that a substantial proportion of patients in our study felt informed about their health, suggesting a potential link between self-awareness and effective diabetes management [21].

However, the lack of confidence in managing diabetes reported by over half of the participants in the present study contrasts with findings from other research. For example, a study by D'Souza et al. (2017) identified self-efficacy as a significant predictor of self-care behavior in individuals with T2DM. Higher self-efficacy was correlated with better adherence to self-care practices, including medication adherence and lifestyle modifications. The discrepancy between feeling informed and lacking confidence in our cohort may indicate that knowledge alone is insufficient without the accompanying self-efficacy to implement self-management behaviors effectively [22].

The issue of medication adherence observed in the Al-Zaher study is consistent with global trends. A study by Mogre et al. (2019) identified several barriers to effective self-management in diabetes patients, including suboptimal adherence to medication and treatment. Factors such as limited patient commitment to lifestyle changes and insufficient rapport between patients and healthcare providers were noted as significant obstacles [23].

The present study also highlights the influence of demographic factors on self-awareness. Male gender, younger age, and higher education levels were associated with greater self-awareness toward diabetes management. This finding is supported by research indicating that education level positively correlates with self-care knowledge and practices [24]. Jackson et al. (2021) found that higher education levels were associated with better knowledge of self-care among

T2DM patients in Nigeria, suggesting that educational attainment plays a crucial role in diabetes self-management across different populations [25].

The present study had demonstrated some limitations. First, the study's cross-sectional nature limits the ability to establish causality between factors such as demographic characteristics, self-awareness, and diabetes management outcomes. In addition, the study focuses on a specific population attending a single primary health care center in Makkah AlMukarramah. The findings may not be generalizable to other regions, cultural contexts, or health care systems. Addressing these limitations in future research will be crucial for obtaining a more comprehensive understanding of diabetes self-management and for designing effective interventions tailored to diverse populations.

5. CONCLUSION:

This study reveals lack of self-awareness among diabetic patients who attend AL-Zaher PHCC at Makkah. Gender, Age, Education Level, and Occupation were the demographics related to the scores, where males, young people, better educated, and person working in creative profession were found in the better position while having better self-awareness. Male patients on average, had more self-awareness compared to female patents and younger age brackets had better self-awareness as compared with the older ages. The educational factor was important with the holders of postgraduate education level reporting the highest level of self-awareness.

These findings underscore the urgent need for targeted educational programs that enhance self-awareness and empower patients, particularly among females, older individuals, and those with lower educational levels. Tailored interventions, regular counseling, and community-based support systems can bridge these gaps. By fostering greater self-awareness, healthcare providers can equip patients with the knowledge and skills needed to better manage their condition, ultimately improving outcomes and reducing the long-term burden of diabetes in Saudi Arabia.

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