General

Patient's Perception of Diabetes Care Services in Hail, Kingdom of Saudi Arabia

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Globally, 643 million people will be affected by 2030, and 783 million by 2045 with diabetes mellitus (DM), a severe disease that affects 537 million people worldwide in 2021. Kingdom of Saudi Arabia (KSA) has the highest prevalence of diabetes mellitus among the top ten countries worldwide. Therefore, the present study aimed to identify the factors influencing diabetes care and assess their relative importance.

Research was conducted in the Hail region of the Kingdom of Saudi Arabia. The study recruited 258 diabetes patients visiting the Primary Health Centers in Hail City as part of their routine healthcare. Analyzing the data was performed using the Statistical Package for Social Sciences (SPSS-22). As far as Cronbach's Alpha is concerned, it was 0.717, and Kaiser-Meyer-Olkin (KMO) was 0.705.

The study has found that the six factors including accessibility of diabetes care ($p = .024$), availability of diabetes services ($p = .029$), quality of diabetes care ($p = .024$), disease management strategies ($p = .037$), basic amenities of health system ($p = .028$) and health education resources ($p = .030$) play a significant role in providing diabetes care services to patients. According to the adjusted R^2 of 0.773 (p 0.001), diabetes care is significantly influenced by these six variables. The comparative importance of the factors indicates that, out of six, quality of diabetes care is the most influential; the availability of diabetes services and health education resources are the second and third most influential factors. In order to provide better care for diabetic patients, healthcare organizations should focus on these factors.

INTRODUCTION

The number of people with diabetes mellitus worldwide is estimated to be 537 million in 2021. By 2030, it is expected to rise to 643 million and 783 million by 2045. As reported in 2021 by the International Diabetes Federation's Guidelines Development Group, the Kingdom of Saudi Arabia is one of the top ten countries with the greatest prevalence of diabetes mellitus (DM) and is expected to be one of the top five countries in terms of type 2 diabetes mellitus (T2DM) by 2030.[1]

A person with diabetes must self-care regularly, and if complications arise, diabetes can adversely affect their quality of life and shorten their life span.[2] Although diabetes does not have a cure, you can live a happy life by studying about the disease and learning how to control it.[3]

In order to prevent Saudi Arabia's growing diabetes epidemic, the country's healthcare system has to play a critical role. In Saudi Arabia, the cost of healthcare and diabetes treatments has increased more than 500 percent since the 1970s. Saudi Arabia has a healthcare budget of 180 billion Riyals, and 25 billion Riyals are spent on the care of diabetics, according to a study published recently. A relatively large portion of the Saudi government's spending on health care in 2014 went to diabetics, with approximately 25 billion Riyals spent on this population alone.[4] Hence, total health spending in Saudi Arabia accounts for 13.9 percent of the cost of diabetes.[5]

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Table 1. KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.705
Bartlett's Test of Sphericity	Approx. Chi-Square	550.875
	df	21
	Sig.	.000

The management of diabetes and the treatment of the disease is largely determined by the patient's behavior. Hence, demonstrating an understanding of self-care, and making a commitment to it, is the first step toward helping patients to better manage their diseases. A patient's self-care is an active and scientific process that is imperative for the prevention of both short-term and long-term complications, and that should be initiated by the patient.[6] The prevalence of diabetes has been increasing in Saudi Arabia for many years, despite the measures taken to manage the disease. Saudi Arabia faces a number of challenges in the management of diabetes, including rising prevalence (particularly among children and young adults), micro- and macrovascular complications, lifestyle changes, late diagnosis, low awareness, and high treatment costs.[5] Therefore, the goal of this study was to identify the factors influencing diabetes care in the Saudi Arabian region of Hail and to assess the relative importance of these factors as perceived by patients.

METHODS

A cross-sectional study was undertaken in Hail, Kingdom of Saudi Arabia. Patients with diabetes who visited the Primary Health Centers (PHCs) in Hail City on a routine basis were eligible to take part in this study, which ran for two months between January and February 2022. All of the participants provided informed consent after receiving ethical approval from the University's ethical committee (H-2020-197). As a condition of participation, the respondents were required to have been diagnosed with diabetes, and those under the age of 18 and those who are not interested in completing the survey were excluded. The data was collected through the use of a structured survey questionnaire. In terms of the structure of the survey questionnaire, it is divided into two sections. The respondent's demographic data was obtained in the first section, and the respondent's perceptions on factors affecting diabetes care were recorded in the second section. The study, overall, obtained 258 responses from diabetes patients through the purposive sampling technique.

In order to analyze the data, we used the Statistical Package for Social Sciences (SPSS-22). According to the reliability statistic of SPSS, Cronbach's Alpha = 0.717 was determined using the Cronbach's Alpha. According to the results of the study, the Kaiser-Meyer-Olkin (KMO) statistic - a measure of sampling adequacy - was determined to be = 0.705, which represents the appropriateness of the sample Table[1].

RESULTS

The demographic data in Table 2 shows the characteristics of the participants in the study. It was found that 71.32 percent of the 258 participants were male, and 40.31 percent of the participants were aged between 30 and 50. The study found that only 5% of participants were illiterate, while 40.31 percent of the participants were employees and 21.71 percent of the ladies were housewives.

Using multiple regression analysis, Table 3 illustrates the factors influencing diabetes care services in Hail. Study examines a wide range of factors, including diabetes care accessibility, diabetes care availability, diabetes care quality, disease management strategies, basic amenities health system and health education resources in providing diabetes care in the region. There is a significant relationship between the factors that affect diabetes care as witnessed in Table 3. All factors have a positive effect on Diabetes care, which is shown in the standard coefficient values for all factors in Table 3.

Diabetes care accessibility has a positive effect on diabetes care access, based on a positive standardized coefficient of 0.072. Using the 5% level of significance (p =.024), the t value for this parameter is 2.100. Based on a standardized coefficient of 0.079, the factor of diabetes service availability measured statistical significance and positively predicted the dependent variable diabetes care. The t value is 2.251, and the significance level is p = .029.

According to the results of the regression analysis, diabetes care quality significantly impacts diabetes care, with a standard coefficient result of 0.091. There is a significant t value of 2.219 at the 5% level (p = 0.024). Statistically, disease management strategies had a positive effect on diabetes care with a standardized coefficient of 0.075. There is significant significance at 5% (p = .037) with a t value of 2.210. According to the results, basic health-care amenities have a positive impact on diabetes care, with a standardized coefficient value of 0.071. This shows a significant difference at 5% (p = 0.028) for the t value of 2.248. With a standardized coefficient value of 0.076, the factor health education resources had a significant positive effect on diabetes care. The t value is 2.011, and it is significant at the 5% level (p =.030).

There is a high degree of likelihood that the coefficient of determination "R" is greater than 0.07, as shown in table 3. Among the six variables, R^2 was adjusted to 0.773 (p 0.001), which confirms that the six variables are significant in relation to diabetes care.

The coefficient values are used to determine how important each factor is, based on the standardized or unstandardized coefficients. According to the standardized coefficient values based on the independent variables, those structural factors that affect diabetes care are ranked from lower to higher in table 4. It can be concluded that the quality of diabetes care is the first most important factor. The availability of diabetes services and education resources influence diabetes care, which is second and third factors. The rest of the factors are also important to consider, such

Table 2. Respondent's demographic profile (n=258)

Variable	Classification	Frequency	%
Gender	Male	184	71.32
	Female	74	28.68
Age (in years)	Under 18	0	0
	19-30	62	24.03
	30-50	104	40.31
	50-70	74	28.69
	70 and above	18	6.97
Education	Illiterate	13	5.04
	Schooling	97	37.60
	Undergraduate	96	37.21
	Graduate	36	13.95
	PG and above	16	6.20
Marital Status	Single	68	26.36
	Married	184	71.32
	Divorce	6	2.32
Occupation	Student	11	4.26
	Employee	104	40.31
	Business	42	16.28
	Housewife	56	21.71
	Unemployed	25	9.69
	Retired	20	7.75

Table 3. Regression Coefficients – Factors affecting Diabetes care

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	R Square
		B	Std. Error	Beta			
1	(Constant)	2.024	.205		8.422	.000	
	Accessibility of diabetes care	.064	.030	.072	2.100	**.024**	
	Availability of diabetes services	.088	.036	.079	2.251	**.029**	
	Quality of diabetes care	.090	.041	.091	2.219	**.024**	.773
	Disease management strategies -	.069	.034	.075	2.210	**.037**	
	Basic amenities of health system	.060	.032	.071	2.248	**.028**	
	Health education resources	.081	.040	.076	2.011	**.030**	

a. Dependent Variable: Factors of Diabetes Care

as the management of diabetes, accessibility of diabetes care, and basic amenities of the health system (Table 4).

DISCUSSION

The study explores the impact of diabetes care accessibility, diabetes services availability, diabetes care quality, disease management strategies, basic health care amenities and health education on diabetes care. Equity in health care facilities and access to health professionals are both required to provide optimal access to health care services, including transportation to services and providers. Interaction between related sectors also affects accessibility to health care services.[7] In order to increase access to health care throughout the country, the Ministry of Health should implement a comprehensive strategy to redistribute health-care services among primary health care centers, general hospitals, and specialist hospitals, as well as health professionals. The study shows that the presence of good-quality health care professionals working in diabetes centers can contribute to patients' satisfaction with the services they

Table 4. Relative importance of Structural Factors in Diabetes care

Dimensions	Standardized Coefficients Beta
Quality of diabetes care	0.091
Availability of diabetes services	0.079
Health education resources	0.076
Disease management strategies	0.075
Accessibility of diabetes care	0.072
Basic amenities of health system	0.071

received.[8] Moreover, to expand services in underserved areas, the Ministry of Health should partner with other sectors including transportation, water, and power, as well as social security services.[9]

To make sure a successful process and achieve good diabetic outcomes, it is imperative that appropriate infrastructure items are in place. According to a previous study in the Aseer region, poor outcomes and processes may be linked to a lack of sufficient and essential support systems for diabetic patients. Diabetes training programs should be provided to physicians so they can provide quality care to diabetic patients. Research has revealed that oral hypoglycemics such as glibenclamide are readily available in public health centers, but insulin and metformin are rarely available there.[10,11] Therefore, glucose meters, gluesticks, and urine proteins testers are not available at more than 20 percent of health centers. PHCCs' inability to test blood sugar levels and urine sugar levels, as well as the shortage of medications in the Aseer region all contributed to poor adherence to medical advice and an increase in defaulters, especially among diabetics. The medical supply department should collaborate with the primary health care department at each sector to distribute drugs and laboratory supplies based on the number and current needs of diabetics in each PHCC in order to resolve this problem.[12–14]

Education about health is essential for assisting patients to comply with medical screening procedures, particularly for those conditions that are common, such as diabetes. In Saudi Arabia, it is difficult to cover all of the Public Health Care Centers due to a lack of qualified health educators. A training program for Arabic-speaking nurses caring for diabetic patients is needed to address the shortage. It is still the most common method for delivering health education in primary care settings. Due to an increasing number of diabetics and hypertensive patients, this approach is difficult for PHC physicians who are already overburdened. As a means of reducing the amount of time patients spend face-to-face with health educators, PHCCs should provide adequate booklets and pamphlets that educated patients can read and use as good references while waiting to be seen. Even though audio-visual aids are increasingly used in health education, they are scarce in public health

centers. Researchers have previously documented that diabetes videotapes (VT) are available only in 11% of PHCCs, whereas diabetes videos are available in 35% of PHCCs. In particular, PHCCs with a shortage of health educators and Arabic-speaking doctors should obtain DM videotapes as soon as possible.[15,16] Besides, introducing diabetes health awareness programs can help to increase the patient's knowledge.[17]

In Saudi Arabia, diabetes is mostly treated through primary healthcare, which is provided by the public health system. Generally, patients get their diabetes treated in a diabetes centre before going to the primary care provider. The first step in obtaining diabetes treatment is enrolling in a primary care clinic, where diabetes cards are issued to the patients. To diagnose diabetes patients, they must undergo a physical examination and have laboratory tests conducted on samples. In addition to this instruction, patients are also given instructions on how to manage their condition on their own, usually by using the Diabetes Patient's Education Checklist. The purpose of the first stage shall be to establish a diagnosis and to prevent any complications that might arise at an early stage. Diabetes centers, therefore, are responsible for managing the patient's care and, if needed, referring the patient to hospitals that specialize in certain areas, such as cardiology and surgery. In addition to managing the patient's health, these centers also arrange for yearly physicals for their diabetic patients.

According to recent systematic reviews published in medical journals, there is a lack of effectiveness in the treatment and control of diabetes type 2 in the countries in the Gulf region. It has been discovered that the conclusion was drawn from the three primary intermediate outcome measures (lipid control, blood pressure, and glycaemic indicators) that were analyzed in this study. According to a recent study involving more than 600 patients, only less than half were able to achieve the clinical outcomes they expected. Several recent studies have shown that primary care clinics are frequently unable to provide suitable levels of medical care, especially when it comes to accurately diagnosing patients and referring them as appropriate to specialists. As a result of the high prevalence of diabetic retinopathy in Saudi Arabia, only 40–68% of the country's diabetics have been sent to eye clinics.[18] The reasons for this suboptimal diabetes management are numerous: the lack of funding, the employment of physicians who are inadequately trained to treat diabetes, the underpayment of diabetes educators, and the undertraining of those educators.

CONCLUSION

According to the current study, the patient's perspective was taken into account in measuring the relationship between the selected factors and its impact on diabetes care services in Hail, Kingdom of Saudi Arabia. Diabetes care accessibility, diabetes care availability, diabetes care quality, disease management strategies, and basic health system amenities and health education resources all affect patient care in diabetes. These factors have a relative importance

that suggests that focusing on them could contribute to the improvement of diabetes care. Therefore the study recommends that healthcare organizations can focus on these factors in order to provide better care to diabetes patients.

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CONFLICTS OF INTERESTS

None declared.

INFORMED CONSENT STATEMENT

Informed consent was obtained from all participants who agreed to be involved in the study.

ETHICAL APPROVAL

The study obtained ethical approval from the Research Committee, University of Ha'il: H-2020-197

AUTHOR CONTRIBUTIONS

Conceptualization, RI and BP; methodology, RI and BP; software, RI and BP; validation, MT, RK, SK, and RD; formal analysis, RI and BP; investigation, BP and RK; resources, MT, RK and R.I.; data curation, IR, BP and SK writing-original draft preparation, RI and SK; writing—review and editing, BP, RK, MT, SK, and RD; visualization, BP; supervision, RI.; project administration, RI, RK and MT; funding acquisition. BP and RI. All authors have read and agreed to the published version of the manuscript.

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