

The study of healthcare professionals' perspective towards the quality of diabetic care services in Abha

V. EASWARAN¹, N.A. KHAN¹, M.J. IOBAL^{1,2}, S.M. ALSHAHRANI¹, K. ORAYJ¹, T.M. ALMELEEBIA¹, M.M.J. SADIO³, S. VIJAYARAGHAVALU⁴, A.T.M. HUSSAIN¹

¹Department of Clinical Pharmacy, King Khalid University, Abha, Kingdom of Saudi Arabia

²Northeastern University Boston, Boston, MA, USA

³Department of Pharmacology, Batterjee Medical College, Jeddah, 21442, Kingdom of Saudi Arabia

⁴Department of Life Sciences (Zoology), Manipur University (A Central University), Imphal, Manipur, India

Abstract. – OBJECTIVE: The aim of this study was to investigate the relationship between organizational characteristics and diabetes care from the perspective of healthcare professionals (HCPs) in Abha, Kingdom of Saudi Arabia.

SUBJECTS AND METHODS: A cross-sectional, self-reported survey of healthcare professionals was done. The study comprised a total of 106 HCPs from various departments involved with diabetes patient clinics or service providers. The electronic data collecting form was used to gather the data.

RESULTS: The study revealed a stronger association between the availability of bed facilities and better glycemic control. Moreover, the majority of HCPs believes that urbanization and sedentary lifestyles are the main contributors to the rise of diabetes mellitus in Saudi Arabia. Depending on organizational features, the regulations that are available for monitoring defaulter patients and running continuous medical education (CME) programs are vastly different. The main cause of the reported lack of medications for managing diabetic care was described as being a problem with the central medical supply store's drug supply, which was influenced by the type of health sector.

CONCLUSIONS: Facilitating change at all levels, including patient education, HCPs education, and organizational development, can improve the quality of treatment. The current study can provide insight into the focus of interventional strategies to deliver diabetes patients with high-quality patient care.

Key Words:

Healthcare professional, Quality, Diabetes, Service.

Introduction

Saudi Arabia is one of the nations with a high prevalence of chronic diseases and their associated risk factors¹. According to the previous statistics, one in four adults is either obese or diabetic, or hypertensive and nearly 6% were having coronary artery disease². The prevalence of chronic diseases is continuously increasing, and obesity and diabetes mellitus (DM) are the two most often reported in Saudi Arabia^{3,4}. Similar studies⁵⁻⁷ conducted by Moradi-Lakeh et al⁵, Al-Hazzaa et al⁶, and El Bcheraoui et al⁷, reported add-on factors like poor physical activity, irrational dietary habits, and smoking were the weighable obstacles in achieving the desired therapeutic management of chronic diseases among Saudi patients⁵⁻⁷.

In Saudi Arabia, the rate of DM has increased tenfold during the last three eras, in which age, socioeconomic changes, and other lifestyle changes have all been cited as contributing factors^{8,9}. Four million Saudi adults, or 18.3% of the adult population, have diabetes, with type 2 diabetes accounting for the majority of cases¹⁰. In addition, more than three million people are at risk for developing diabetic mellitus (DM) since one-quarter of those over 30 have prediabetes¹¹.

A relevant study conducted in Saudi Arabia stated that 57.8% and 43.6% of the confirmed cases of hypertension and DM, respectively, were not diagnosed at the onset; whereas, among those diagnosed, 31.1% and 9% were not treated at all or not treated appropriately. Among those treated, 55.0% of the hypertensive patients and 29.1% of the diabetic patients could not achieve disease control¹².

The cornerstones of controlling DM are optimal care and considerate patient management¹³. Yet, better patient outcomes and satisfaction depend on providing these patients with high-quality care, which varies across different healthcare settings¹⁴. Therefore, it is of utmost importance to evaluate the standard of diabetes care offered by Saudi Arabian health organizations and the obstacles to providing this service. Therefore, the current study was undertaken to explore the association between organizational characteristics and the quality of diabetes care.

Subjects and Methods

Study Design and Settings

Between January and April 2020, a cross-sectional observational, self-reported survey was undertaken. The healthcare professionals (HCPs) (physicians, nurses, pharmacists, physiotherapists, and dieticians) who participated in the study (106; 60 men/46 women) came from nine different healthcare facilities, including primary care facilities, polyclinics, and multi-specialty hospitals.

Study Tool and Data Collection

Using a self-reported, structured electronic data collection form, the necessary information was gathered from the randomly chosen diabetes clinics in and around Abha.

By consulting a variety of academic sources and field professionals, the survey questionnaire was created. The initial questionnaire was prepared in English, and it was reviewed by practicing endocrinologists, pharmacists, and nutritionists. Based on the review report, the questionnaire was revised to suit the current study settings.

7 pharmacists, 7 nurses, and 2 physicians participated in a pilot test to determine the validity of the questionnaire. Calculating the questionnaire's internal consistency allowed researchers to determine its validity. It was discovered that the calculated internal consistency (Cronbach's alpha) was 0.64.

The questionnaire included five sections, with a mixed model approach of items. It includes socio-demographic characteristics (5 items), organizational characteristics (6 items), reasons for the shortage of medicines (1 item), reasons for uncontrolled diabetes mellitus (1 item), and diabetes care (9 items). The finalized version of the survey questionnaire in the English language was created in Google forms and the link for the same was shared with HCPs *via* email and social media.

Ethical Considerations

The subjects who denied to participate in the survey or disagreed to provide electronic consent were excluded from the study. The confidentiality of the data was ensured throughout the study. The study was approved by the Ethical Committee of the Scientific Research King Khalid University (ECM #2020-201-HAPO-06-B001) before conducting the study.

Statistical Analysis

For statistical analysis, all data were coded and entered into SPSS 22.0 (IBM Corp., Armonk, NY, USA), the statistical package for social sciences (IBM Corp., Armonk, NY, USA). The sociodemographic characteristics of healthcare workers and healthcare organizations were analyzed using descriptive statistics. Between private and public hospitals, the frequency of replies to questions about various organizational factors linked to diabetes care was estimated using the Chi-square test. The Chi-square test was also used to assess organizational features that may be to blame for the lack of medications and uncontrolled diabetes. *p*-value lower than 0.05 is considered significant.

Results

Table I shows the current study included a survey of 106 healthcare professionals (HCPs) from different specialties. Among them 60 were males and 46 were females of various age groups, starting from 21 years to more than 50 years. The age group of 50 years and above lacks interest in participating in the survey (14.2%). The majority of HCPs were physicians (21.4%), pharmacists (27.4%), and nurses (25.5). The current study has included 66% of the HCPs with more than 5 years of professional experience.

The organizational characteristics of diabetes clinics were described in Table II. A sum of 84 government healthcare service providers was included in this study. The majority of the healthcare service providers included in the current study are providing service only to outpatients (53.8%), and 46.2% are providing service to both outpatients and inpatients. Most of the organizations were only 50-bedded hospitals (45.3%). Only 10.4% of healthcare organizations have more than 100 beds for patients. Nearly a quarter of the healthcare organizations included in the current study had at least two physicians to deal with diabetic patients. About 13.2% of

Table I. Socio-demographic characteristics of the healthcare professionals.

	Frequency	Percentage (%)
Gender		
Male	60	56.6
Female	46	43.4
Age in years		
21-30	29	27.4
31-40	32	30.2
41-50	30	28.3
>50	15	14.2
Professional category		
Physicians	23	21.7
Pharmacists	29	27.4
Nurses	27	25.5
Others	27	25.5
Year of experience		
Less than 5 years	36	34.0
More than 5 years	70	66.0

the healthcare organizations were having five or more physicians to care for diabetic patients. At the same time, nearly a quarter of the healthcare organizations were running at least two diabetic

clinics. More than 90% of all the organizations included in the current study had supportive care services for diabetic patients.

Table III shows the association between organizational characteristics and the quality of diabetes care. The age distribution of the patient's hospital visit is statistically significantly influenced by the type of treatment given (in-patient or outpatient), the number of diabetologists, and the availability of diabetic clinics ($p \leq 0.05$). Good glycemic control was significantly more prevalent in areas with more bed facilities for treating diabetes patients ($p = 0.029$). Urbanization is the primary cause of diabetes, according to one-third of the HCPs who participated in the current study. The majority of respondents – nearly 85% – agreed that diabetes among Saudis is mostly caused by a sedentary lifestyle ($p = 0.003$, $p = 0.029$).

According to the study results, one of the main factors contributing to diabetes in the Saudi population is familial marriages ($p = 0.019$). In the current study, free treatment is not having any influence on patients' behavior.

The degree to which each organization had a policy for keeping track of defaulter patients varied significantly. The policy to treat defaulter patients is influenced by all organizational features ($p \leq 0.05$).

Table II. Organizational characteristics of diabetes care centers.

Characteristics		Frequency (N)	Percentage (%)
Type of health sector	Government	84	79.2
	Private	22	20.8
Type of service rendered to diabetes patients	Outpatient	57	53.8
	Both outpatient and inpatient	49	46.2
Number of beds	30 beds	23	21.7
	50 beds	48	45.3
	100 beds	19	17.9
	More than 100 beds	11	10.4
Number of Physicians to care, for diabetes patients	One	15	14.2
	Two	27	25.5
	Three	36	34.0
	Four	14	13.2
	Five	6	5.7
	More than five	8	7.5
Number of diabetic clinics	One	22	20.8
	Two	26	24.5
	Three	26	24.5
	Four	12	11.3
	Five	6	5.7
	More than five	14	13.2
Availability of supportive care for diabetes patients	Yes	101	95.3
	No	5	4.7

Table III. Relationship between organizational characteristics and quality of diabetes care (Chi-square test).

Items	Response	Total (N)	Percentage (%)	Type of health sector	Type of service	Number of beds	Number of physicians	Number of clinics	Availability of supportive care
Risk for diabetes or barriers in care									
What is the age group of your patients?	Less than 25 years	4	4	0.662	0.003*	0.190	0.003*	0.004*	0.135
	25-50 years	40	38						
	More than 50 years	62	58						
Do you think urbanization is the major cause of diabetes?	Strongly agree	33	31	0.232	0.051	0.144	0.433	0.003*	0.528
	Agree	48	45						
	Neutral	22	21						
	Disagree	2	2						
	Strongly disagree	1	1						
Do you think a sedentary lifestyle is the major cause of diabetes among the Saudi population?	Strongly agree	31	29	0.650	0.719	0.029*	0.178	0.555	0.360
	Agree	59	56						
	Neutral	14	13						
	Disagree	1	1						
	Strongly disagree	1	1						
Do you think consanguineous marriages is one of the major cause of diabetes among the Saudi population	Strongly agree	12	11	0.170	0.065	0.099	0.002*	0.019*	0.091
	Agree	46	43						
	Neutral	38	36						
	Disagree	10	9						
	Strongly disagree								
Diabetes Care									
What is the status of glycemic control of the majority of your patients?	Well-controlled	24	23	0.163	0.654	0.029*	0.747	0.698	0.514
	Fairly controlled	63	59						
	Poorly controlled	19	18						
Does free treatment make the patients careless about their treatment and follow-up?	Strongly agree	15	14	0.652	0.719	0.397	0.218	0.299	0.203
	Agree	30	28						
	Neutral	38	36						
	Disagree	21	20						
	Strongly disagree	2	2						
Does your organization or healthcare setting have a policy for monitoring defaulter patients?	Yes	41	39	0.000*	0.041*	0.008*	0.023*	0.000*	0.124
	No	35	33						
	Do not know	30	28						
Have your organization or healthcare setting conducted any CME programs related to diabetes mellitus in the past six months?	Yes	39	37	0.588	0.003*	0.082	0.031*	0.001*	0.191
	No	41	39						
	Do not know	26	25						
Are you confident in starting new therapeutic approaches (New generation Anti-diabetics-Insulin &OHAs)?	Yes	59	56	0.414	0.417	0.018*	0.541	0.169	0.531
	No	7	7						
	Do not know	40	38						

*p-value lower than 0.05 is considered significant.

Similarly, executing a CME program for HCPs was significantly impacted by organizational factors ($p \leq 0.05$). The HCPs working in diabetes care organizations with more beds were more willing to use more modern therapy modalities to treat diabetic patients ($p=0.018$).

Table IV outlined the causes of uncontrolled diabetes. The majority of causes of uncontrolled diabetes, according to nearly 93% of the healthcare professionals who participated in the current study, include an inactive lifestyle and poor nutrition management. The least frequently cited factor (15%) for uncontrolled diabetes was a lack of medications. Among the various reasons stated for uncontrolled diabetes, shortage of medicines and patients' unwillingness to take medications are the reasons which are significantly influenced by the type of health sector and the number of beds available in the organization respectively ($p=0.000$ and 0.001).

The lack of medications for managing diabetes was cited by medical specialists for several reasons (Table V). The majority of the healthcare professionals involved in the study (66%) cited "lack

of drug supply from the central medical supply store" as a significant factor in the lack of medications for diabetes care. This statement was influenced significantly by the nature of the healthcare industry and the number of physicians working in the clinic ($p=0.022$ and 0.043), respectively. The type of healthcare industry and the number of physicians employed by the organization are two additional factors that were influenced by the most common predictors.

Discussion

Managing diabetic care is a difficult task in general, and it became more complicated during the COVID-19 pandemic. Diabetes management depends on many variables, including those relating to the patient and the organization, such as dietary restrictions, medication adherence, and lifestyle changes. Several other obstacles, including those related to culture, language, and the size of medical facilities, have also been documented to have an impact on diabetes care¹⁵. Elderly age

Table IV. Reasons for uncontrolled diabetes mellitus (Chi-square test).

Reasons	Total (N)	Percentage (%)	Type of health sector	Type of service	Number of beds	Number of physicians	Number of clinics	Availability supportive of care
Shortage of medicines	16	15	0.000*	0.962	0.541	0.393	0.093	0.754
Patients are not willing to change their medications (to insulin/ or other oral medications)	42	40	0.530	0.307	0.001*	0.486	0.177	0.986
Lack of medication adherence	40	38	0.401	0.086	0.161	0.670	0.102	0.402
Sedentary lifestyle, Poor diet control, and others	99	93	0.161	0.260	0.763	0.462	0.694	0.542

* p -value lower than 0.05 is considered significant.

Table V. Reasons for the shortage of medicines for diabetes care (Chi-square test).

Reasons	Total (N)	Percentage (%)	Type of health sector	Type of service	Number of beds	Number of physicians	Number of clinics	Availability supportive of care
Lack of drug supply from central medical supply store	70	66	0.022*	0.986	0.088	0.043*	0.054	0.499
Lack of supply from the distributor	29	27	0.992	0.323	0.023*	0.006*	0.000*	0.705
High price Hike	14	13	0.000*	0.520	0.224	0.091	0.047*	0.372
Near-Expiry	2	2	0.303	0.019*	0.075	0.310	0.777	0.751

* p -value lower than 0.05 is considered significant.

is a similar barrier or risk factor that affects diabetes care. According to the majority of studies conducted in the Kingdom of Saudi Arabia, diabetic patients are more frequently over 50 years old^{4,16,17}. The age range of diabetes patients attending the healthcare organization is revealed by the current study which may change according to the kind of service offered, the availability of doctors, and the number of clinics.

According to the HCPs involved in our study, sedentary behavior and urbanization are the main causes of diabetes, particularly among Saudi Arabians. Strong evidence suggests that urbanization is the primary risk factor for diabetes and other non-communicable diseases, which is in line with what our study population felt^{18,19}. Poor dietary habits and a sedentary lifestyle were identified as the main contributors to and impediments to poor glycemic control in the study population, and similar findings have been reported in other investigations²⁰⁻²². It is said that consanguineous marriage is one of the risk factors for several hereditary disorders, including DM, and that it is more common in Middle Eastern countries. Similar to other reports, in the current study, most of the healthcare professionals agreed that consanguineous marriage is a risk factor for the development of DM²³⁻²⁶.

Access to diabetes care was found to be a significant predictor of glycemic control, according to a longitudinal study²⁷ done in the San Diego population. Contrarily, the HCPs' perspective of our study demonstrates that, except for the number of beds available to treat diabetes patients, glycemic management is not dependent on any organizational factors. This may be a result of the simple access to and availability of insulin and other antidiabetic drugs. These findings are comparable to those of Cook et al²⁸.

The majority of HCPs held the opinion that patients receiving free care are not becoming careless. Regardless of organizational traits, all patients are more attentive to their diabetic care and ready to receive treatment. These findings conflict with those published by Itumalla et al¹⁴, who claimed that the presence of high-caliber HCPs in hospital settings increases patient satisfaction.

According to the literature, inadequate patient knowledge and awareness is a significant impediment to controlling diabetes, which in turn results in infrequent follow-up²⁹. Thus, loss of follow-up can be minimized by various strategies including creating awareness and making clinical and administrative changes. In addition, introducing

a healthcare level policy for monitoring defaulter patients can also minimize the loss of follow-up³⁰. The majority of HCPs in the current study stated that they have a protocol for keeping track of diabetic patients who are in default. These policies may or may not be offered based on some variables³¹. The availability of these policies is similarly dependent on all the organizational parameters examined in the current study; type of health sector, type of service, number of beds, number of physicians and number of clinics, and availability of supportive care.

The CME programs tend to increase knowledge and can foster changes in the professional practice³². However, due to several factors, including organizational characteristics³³ the participation of HCPs in the CME is constrained. According to the HCPs in the current study, the speed of the CME program is mostly dependent on the size of the hospital (number of beds, physicians, and clinics), as well as the type of service they offer (inpatient or outpatient service)³⁴.

The HCPs in our study stated that they are not hesitant to try new therapeutic approaches to treat their patients. The results reported in a systematic review³⁵ explained that the combined organizational contextual features are influencing the implementation of evidence-based practice but the individual features are not.

Uncontrolled diabetes is most usually attributed to poor adherence to anti-diabetic medication^{36,37}. In addition, a sedentary lifestyle, poor diet management, and a lack of medications all contribute to uncontrolled DM. According to the HCPs in our study, pharmaceutical nonadherence is caused by patient-level factors, such as patients' inactive lifestyles or poor nutrition management, rather than by any organizational characteristics^{38,39}.

Despite being the least often cited cause of uncontrolled DM in our analysis, medication adherence is significantly related to the accessibility and availability of medications and improves patient outcomes^{36,40}. Shortage of medicines is one of the factors which impacts the availability of medicines and is caused by several factors, including supply, demand, and regulatory concerns⁴¹.

Various reasons for the shortage of medicines were evaluated. Each reason evaluated in the current study is identified to be influenced by at least one of the organizational characteristics. Similar kinds of reports were also reported by the drug shortage evaluation program done by the pharmacy practice research unit of the center hospitalier universitaire Sainte-Justine⁴².

Limitations

This study has several limitations because it is limited to a particular area of Saudi Arabia and cannot be generalized to the entire nation. The choice of study subjects may have been impacted because the current study did not use a specific strategy to randomize the selection of subjects. Additionally, because the study was cross-sectional, causal inference cannot be drawn from the results.

Conclusions

A healthcare organization, a healthcare practitioner, and a healthcare recipient must all be committed to the complicated process of diabetes care. Facilitating change at all levels, including patient education, HCP education, and organizational development, can improve the quality of treatment. The results of the current study can be used by healthcare organizations to design active interventional strategies, such as CME programs, enhanced patient care policies, and prescription drug shortage prevention guidelines. Healthcare organizations should shed light on the contributing factors and enhance the delivery of care to diabetes patients at the grass root level among the community to have a healthy population in the future.

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Ethics Approval

The study was approved by the Ethical Committee of the Scientific Research King Khalid University (ECM #2020-201-HA-PO-06-B001) Abha, Kingdom of Saudi Arabia.

Informed Consent

Informed consent was obtained through electronic format before the start of the survey.

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Conflicts of Interest

The author reports no conflicts of interest in this work.

Data Availability

Data will be available on demand or request.

Authors' Contributions

All authors contributed equally.

ORCID ID

Vigneshwaran Easwaran: 0000-0002-8688-4825
Noohu Abdulla Khan: 0000-0002-3478-4566
Mir Javid Iqbal: 0000-0002-7967-1098
Sultan M Alshahrani: 0000-0002-6194-7092
Khalid Orayj: 0000-0001-6651-2306
Tahani M Almeleebia: 0000-0003-4678-8756
Mantargi Mohammed Jaffar Sadiq: 0000-0002-3719-6241
Sivakumar Vijayaraghavalu: 0000-0002-6770-6716

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