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FACTORS ASSOCIATED WITH PHYSICIAN USE OF CLINICAL DIABETES MELLITUS GUIDELINES IN SAUDI ARABIA

Medicine

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ABSTRACT

Diabetes mellitus (DM) is the sixth leading cause of death in Saudi Arabia, with a prevalence of 23.9%. This cross-sectional study aimed to assess the use of DM guidelines by physicians in primary health centers and factors that may improve their use. A total of 185 of 303 physicians completed the questionnaire (response rate, 61.1%). Only 10.8% of physicians did not follow the guidelines. The majority of physicians reported that DM guidelines influenced their management plan (83%), and using them improves patient outcomes (85.4%). Adherence to DM guidelines was significantly higher among physicians who were seeing less patients per day (P = .001), trained in using DM guidelines (P = 0.000), had higher level of knowledge of DM guidelines (P = .000), and received a paper (P = 0.48) or an email copy (P = 0.23) of the guidelines.

KEYWORDS

Diabetes Mellitus, Guidelines, Practice, Saudi Arabia

Introduction

Diabetes mellitus (DM) is the sixth leading cause of death in Saudi Arabia (World Health Organization, 2016), and according to DM prevalence, Saudi Arabia is ranked 7th worldwide, with a prevalence of 23.9% which is progressively increasing (Naeem, 2015). In total, the overall cost of diabetes in Saudi Arabia was an estimated 17 billion riyals in 2014, with an expected future increase to 43 billion riyals (Mokdad et al., 2015).

A review for DM management factors in Saudi Arabia was completed to establish a theoretical framework of what effect this diabesity. According to this framework, the factors that affect DM management are: the health system, patients' factors, caregiver factors, and guidelines (Hashmi & Khan, 2016). For the past 25 years, the American Diabetic Association (ADA) has provided evidence-based guidelines, updated annually, to improve the quality of DM management (American Diabetes Association, 2017). The National Saudi Diabetic guideline for primary health center (PHC) has adapted the ADA recommendations and even added additional recommendations. However, a study examining physician adherence in Saudi Arabia to 11 ADA recommendations among senior family physicians, board-certified in family medicine or specialized in DM care, found only 3.3% of the 450 patients received complete recommended care (Elawady, Hassan, Taha, & Warrag 2014).

Therefore, this study aimed to assess physicians' current clinical practice and attitudes in Saudi Arabia regarding DM guidelines, and to determine factors affecting physician adherence to DM guidelines.

Methods

This cross-sectional study was conducted among PHCs' physicians in Qatif, Dammam, and Al Khobar. All physicians treating DM patients were included. Physicians who were involved in administration only and new physicians who had been working for <6 months were excluded. Data were collected using the Harris Interactive Survey for physician use of clinical guidelines (New England Healthcare Institute, 2008), which is a validated self-administered questionnaire, after minor changes (Appendix). It includes questions of demographic characteristics and 12 components to assess the current use of DM guidelines, perceived knowledge level, attitudes, and factors that affect adherence to DM clinical guidelines.

An online link to the questionnaire was sent to all physicians according to MOH administration list; the participants were followed up to ensure a good response rate and answer any queries.

Statistical analysis

Dependent variables included current use, knowledge level, and attitude towards DM guidelines. Independent variables included physician age, gender, years of experience, and factors that affect adherence to the guidelines (time, public reports regarding the importance of adherence, receiving the guidelines and guideline training).

Variables were coded before distributing the questionnaire. After calculating the response rate, data were analyzed using SPSS (version 16; SPSS, Chicago, IL, USA) and *P*-values less than .05 were considered significant. A descriptive analysis was performed for all data. A Chi-square test was used to analyze the association between categorical dependent variables (use of DM guidelines, perceived knowledge and attitude) and influencing factors.

Ethical considerations

This study was approved by the of the institutional review board of the Saudi postgraduate Family medicine program, Eastern province - Ministry of Health administration (Approval number: 00966569310917). Informed consent was obtained from participating physicians, and data was kept confidential and used for the research purpose only.

Results

A total of 303 physicians received the questionnaire link, and 185 (61%) physicians responded. Participants were mostly female (64.9%; mean age 34.5 [range, 26–60] years) and general physicians. Demographic data are shown in Table 1.

Table 1. Demographic and work-related characteristics of participants

Characteristics	Description	N	%
Gender	Male	65	35.1
	Female	120	64.9
Nationality	Saudi	173	93.5
	Non-Saudi	12	6.5
Job title	GP	124	67
	FM specialist	44	23.8
	FM consultant	17	9.2
		Mean	SD
Age		34.5	± 6.708
Years of experience		6.47	± 5.166
No. of DM patients per day		7.81	± 5.931
No. of total patients per day		35.98	± 24.141

Abbreviations: GP, general practitioner, FM, family medicine

The ADA guidelines were primarily used by the physicians (61.1%), but only 58.9% of physicians were trained in using the guidelines within the last two years. Half of the physicians perceived themselves as being knowledgeable, while 4.9% responded with “not very knowledgeable”. Physicians more frequently used the guidelines

when diagnosing rather than for providing preventive care or making treatment decisions. The most common reason for not using the guideline was a deficiency in the clinic technology. The majority (83%) of physicians responded that DM guidelines had the greatest influence on their treatment decisions, compared to several other factors such as personal experience, residency, and formal education (Table 2).

Table 2a. Current practices related to DM guideline use.

Variable	Answer	N	%
Guideline used	National	42	22.7
	ADA	113	61.1
	Not using any	20	10.8
	Others	10	5.4
Trained in the past 2 y	Yes	109	58.9
Self-perceived level of knowledge	Not very knowledgeable	9	4.9
	Somewhat knowledgeable	31	16.8
	Knowledgeable	93	50.3
	Very knowledgeable	47	25.4
	Extremely knowledgeable	5	2.7
Use of guidelines per day	Never	20	10.8
	Less than 3 times	67	36.2
	3 times or more	98	53.0
Use of guidelines in preventive care	Rare	12	6.5
	Few	17	9.2
	Sometimes	37	20.0
	Often	68	36.8
	Always	51	27.6
Use of guidelines in treatment	Rare	8	4.3
	Few	8	4.3
	Sometimes	24	13.0
	Often	69	37.3
	Always	76	41.1
Use of guidelines in diagnosis	Rare	8	4.3
	Few	6	3.2
	Sometimes	12	6.5
	Often	34	18.4
	Always	125	67.6
Reasons for not using guidelines	Dx not determined	28	15.1
	Not aware	17	9.2
	Not convenient	20	10.8
	Disagree with guideline	2	1.1
	No desired outcome	2	1.1
	No clinical technology	33	17.8

Table 2b. Factors influencing physician therapy decisions

	N	%
Personal experience	108	58.4
DM guidelines	154	83.2
Medical journals	23	12.4
Formal education	44	23.8
Beers discussion	81	43.8
Residency	34	18.4
Pharmaceutical sales agent	17	9.2

Most physicians agreed that using guidelines improved patients' clinical outcomes (85.4%), and 81.1% reported having positive past experiences with the guidelines. However, only 31.9% disagreed that guidelines are too broad to be implemented as a standard approach. (Table 3).

Table 3. Physician attitudes regarding DM guidelines

Sum of responses (agree and strongly agree)	N	%
Would use the guidelines more if it required less effort to find	111	60.0
Would use the guidelines more if required less effort to access when needed	129	69.7
DM guidelines improve clinical outcomes for patients	158	85.4
Would use the guidelines more if it required less effort to read	117	63.2
Guidelines increase efficiency and save money	120	64.9
Sum of responses (disagree and strongly disagree)		
Guidelines are too broad to be implemented as a standard approach	59	31.9
Own experience resulted in better outcomes compared to guidelines	97	52.4
Guidelines undermine the autonomy of the physician	85	45.9
Guidelines are rarely helpful because each patient is different	117	63.2
Experimenting with other approaches can lead to innovation	60	32.4
Feel more empowered if I could order medical services different than the guidelines	95	51.4
Past experience of the guidelines was not helpful to my patients	150	81.1

Table 4 shows the physicians' responses regarding factors that may improve the use of DM guidelines. The most significant factor was receiving the guideline as an order entry system, followed by receiving it in paper form.

Table 4. Factors that may improve the use of DM guidelines

Factor	N	%
May use the clinical guidelines more if you received them as: Order entry system	140	75.6
Published journal	84	45.4
Paper	105	69.7
Email	83	44.8
If reports of physician compliance with the guidelines were online, accessible by everyone in the PHC	119	64.3
If reports of physician compliance with the guidelines were online, accessible by patients	110	59.4
Having 10 minutes more with each patient	88	47.6

The factors most significantly associated with consistent use of guidelines were number of patients seen per day, guideline training, and self-perceived knowledge about guidelines. Additionally, physicians reported that receiving either a paper copy or an email copy of the guidelines may significantly improve adherence. Additional factors are shown in Table 5.

Table 5. Factors associated with consistent use of DM guidelines

		Using the guideline for most cases consistently				
		No, and not considering	No, but considering	No, but planning	Yes, using it	P value
Average of all patients per day	<20	2.6%	.0%	.0%	97.4%	0.001
	21-30	.0%	7.0%	18.6%	74.4%	
	31-40	3.4%	13.8%	6.9%	75.9%	
	>40	8.7%	23.9%	10.9%	56.5%	
Trained in last 2 year	Yes	2.8%	5.5%	% 1.8	89.9%	.000
	No	5.3%	21.1%	19.7%	53.9%	
Describe your knowledge of DM clinical guidelines	Not very knowledgeable	22.2%	55.6%	11.1%	11.1%	.000
	Somewhat knowledgeable	9.7%	19.4%	16.1%	54.8%	
	Knowledgeable	2.2%	9.7%	10.8%	77.4%	
	Very knowledgeable	.0%	2.1%	2.1%	95.7%	
	Extremely knowledgeable	.0%	20.0%	.0%	80.0%	
May use the guidelines more if received in 1) Order entry system	No more	7.7%	7.7%	15.4%	69.2%	.546
	Slightly more	3.1%	12.5%	9.4%	75.0%	
	Somewhat more	7.5%	17.0%	5.7%	69.8%	
	Much more	1.1%	9.2%	10.3%	79.3%	
2) Journal	No more	6.4%	6.4%	19.1%	68.1%	.147
	Slightly more	3.7%	14.8%	1.9%	79.6%	
	Somewhat more	4.2%	10.4%	8.3%	77.1%	
	Much more	.0%	16.7%	8.3%	75.0%	

3) Paper	No more	7.4%	3.7%	25.9%	63.0%	.048
	Slightly more	5.8%	15.4%	1.9%	76.9%	
	Somewhat more	.0%	19.0%	4.8%	76.2%	
	Much more	3.2%	7.9%	11.1%	77.8%	
4) Email	No more	11.1%	19.4%	19.4%	50.0%	.023
	Slightly more	3.0%	10.6%	4.5%	81.8%	
	Somewhat more	2.1%	10.4%	6.2%	81.2%	
	Much more	.0%	8.6%	11.4%	80.0%	
Reports of compliance shared with other physicians	No more	3.6%	10.7%	17.9%	67.9%	.659
	Slightly more	7.9%	7.9%	10.5%	73.7%	
	Somewhat more	2.9%	14.5%	5.8%	76.8%	
	Much more	2.0%	12.0%	8.0%	78.0%	
Reports of compliance shared with patients	No more	2.9%	8.8%	11.8%	76.5%	.487
	Slightly more	9.8%	14.6%	9.8%	65.9%	
	Somewhat more	1.4%	12.5%	5.6%	80.6%	
	Much more	2.6%	10.5%	13.2%	73.7%	
Having 10 minutes more with each patient	No more	11.1%	.0%	22.2%	66.7%	.113
	Slightly more	8.1%	21.6%	8.1%	62.2%	
	Somewhat more	3.9%	11.8%	3.9%	80.4%	
	Much more	1.1%	9.1%	11.4%	78.4%	

Discussion

Of the physicians surveyed in this study, most used guidelines and only 10.8% of participants did not use any DM guidelines. More than half (58.9%) were trained on the guidelines in the last two years. Another study of physicians in Saudi Arabian PHCs, tertiary hospitals, and private hospitals showed that while only 49% of practitioners had received specific training in DM guidelines, up to 81% were following the guidelines (El Nashar, Alzaidi, Saeedalmalki, & Alghamdi, 2016). However, a more recent a study in the United States showed that only 38% of doctors in primary health centers were using DM guidelines, while two thirds were using it in screening. (Mehta, 2017). In Palestine, a recent study showed that only 11.5% of PHC physicians reported adherence "always" or "often" to the key recommendations of DM guidelines (Radwan et al., 2017).

In the present study the majority of physicians (85.45%) responded that they "agree" or "strongly agree" that DM guidelines can improve patient outcomes, and 64.9% responded that using DM guidelines is cost effective. Most physicians (89.2%) considered the DM guidelines to be convenient to use. These findings are similar to another study in Saudi Arabia that reported 90% of physicians agreed that clinical guidelines help in DM management (Khan et al., 2011). However, many physicians agree that ADA guidelines are not clear enough, and that they need administrative support to have more time with patients diagnosed the DM (Zgibor & Songer, 2001). In a study investigating physicians' perception of DM guidelines in India, the majority of physicians agree that the multi-targeted approach in the ADA guidelines (Unnikrishnan et al., 2012) is most favorable. Furthermore, previous studies in Saudi Arabia and Palestine have found that providing a copy of DM guidelines can significantly improve physician compliance (Khan et al., 2011), (El Sharif, Samara, Titi, & Awartani, 2015). These findings support the need for creating a well-organized training program for physicians that is focused on the use of DM guidelines, and developing indicators to follow its application and outcomes.

Limitations

Data gathered for this study were collected using an online, self-administered questionnaire, which did not allow open-ended answers. In-person interviews may enable physicians to express in more detail the barriers for guideline adherence and recommendations for improvement.

Conclusions

Physicians should receive additional training and copies of DM guidelines as initial steps for high quality DM management. Indicators for measuring physicians' adherence, and individualized action plans, should be developed and monitored.

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