Assessing Adherence to Clinical Practice Guidelines Among Primary Care Physicians in Bahrain: A Cross-sectional Study

Dhabya Al Sada[1]*, Yusra Irshad Husain[2] and Zainab Al Misbah[2]

[1]*Family Medicine Clinic, NBB Arad Health Center, Ministry of Health, Sanabis, Bahrain*
[2]*Family Medicine Clinic, Muharraq Health Center, Ministry of Health, Sanabis, Bahrain*

ABSTRACT

Objectives: To assess the adherence to clinical practice guidelines (CPGs) and explore the barriers to their implementation among primary care physicians (PCPs) in Bahrain. *Methods*: A cross-sectional study was conducted using an online survey among physicians working in 20 randomly selected public sector primary health centers in Bahrain. Private-sector physicians and family medicine residents were excluded. Outcome measures were assessing the extent of adherence to CPGs, describing the results in association with work roles, gender, level of formal training, and years of working experience, and investigating the barriers to adhering to CPGs. *Results:* The subjects were 149 PCPs (consultants, specialists, and general practitioners) working in government primary health centers. The vast majority (98.0%) reported that they implemented CPGs in their daily practice. The most commonly cited reason (79.2%) for implementation was that the CPGs were evidence-based. The most implemented guidelines pertained to diabetes (91.3%), hypertension (81.2%), and hyperlipidemia (69.8%). The least implemented ones were screening of women (38.9%) and postnatal care (45.6%). The level of formal medical training was associated with the implementation of CPGs on preventive care, antenatal and postnatal care, and children and women screening ($p < 0.05$). Hypertension and bronchial asthma guidelines were implemented more by male physicians ($p < 0.05$) while female physicians were more adherent to CPGs on antenatal and postnatal care, and women and child screening ($p < 0.05$). The main barrier reported by the physicians was that they wished to know more about CPGs before applying them (mean ± SD = 3.8 ± 0.9). The perception that managers or directors are non-cooperative towards the application of CPGs was associated with years of experience ($p = 0.008$) and the position of the physician ($p = 0.028$). General practitioners were more likely to consider non-cooperation from patients as a barrier ($p = 0.025$). *Conclusions:* Most PCPs in Bahrain are adherent to CPGs in their daily practice and encounter minimal barriers. Identifying and resolving barriers can help develop unified and standardized guidelines that promote better consistency in patient management, minimize medical errors, and conserve resources.

P rimary care physicians (PCPs), being the first contacts for patient care, play an important healthcare role, especially in the management of chronic diseases. The Ministry of Health (MoH) in Bahrain has formulated multiple clinical guidelines on chronic disease management in primary health care, such as hypertension, diabetes, thyroid diseases, hyperlipidemia, and asthma, which can be accessed at the MoH website. As per the United Kingdom Institute of Medicine,[1] clinical practice guidelines (CPGs) are "statements that include recommendations intended to optimize patient care, informed by a systematic review of evidence and an assessment of the benefits and harms of alternative care options". There is evidence that adhering to CPGs can enhance quality of care and health outcomes by maintaining consistency and reducing clinical errors.[2,3]

Being compliant with CPGs also minimizes unnecessary services and enhances patient satisfaction.[4] However, such compliance has been reported to be generally poor among primary healthcare services around the world. A recent study in China revealed that only 11.3% of primary care general practitioners (GPs) frequently used CPGs

while 8% never used them despite being aware of them.[5] The reasons cited for non-compliance included lack of access to guidelines, lack of training, lack of awareness, and guidelines not being updated in a timely manner.[5]

A qualitative study among GPs in Norway showed low adherence to guidelines despite knowing their necessity and the opportunity they offered in practicing evidence-based medicine.[6] The reasons given included guideline overload, inaccessible and lengthy guidelines, and a mismatch between guidelines and patient needs.[6] A qualitative study in South Africa among 27 GPs revealed time constraints, lack of financial resources, and organization of the healthcare system to be the major barriers in an already overstrained primary care system.[7]

Alternatively, GPs in the Netherlands had positive attitudes towards their national guidelines with a perceived adherence rate of 77%, with adherence varying between guidelines. The limited barriers they reported were mostly related to patients' preferences, needs, and capabilities, and the lack of practical applicability of some guidelines.[8] A Saudi Arabian study showed high (88.5%) CPG adherence among family physicians in Riyadh city. Ease of access to CPGs and 'autonomy' were given as the main reasons. The main obstacles cited were lack of support from the leadership, lack of awareness, and lack of knowledge.[9]

To our knowledge, no study has been conducted in Bahrain focusing on the adherence and barriers to implementation of CPGs among PHPs. Therefore, we sought to assess the level of CPG adherence of PHPs in this country and identify the related barriers. The findings of this study may help the decision-makers better understand the needs of physicians and contribute to a more effective system of guidelines, leading to their optimal implementation.

METHODS

This cross-sectional study was conducted among PCPs in Bahrain in February 2021. Four health centers from each of the five health regions in the country were randomly chosen, yielding a total of 20 centers. A sample size of 179 PCPs was calculated using an online calculator available at SurveyMonkey website, based on 95% CI, a 5% margin of error, and the fact that a total of 333 physicians were working in government primary health centers (PHCs).

Inclusion criteria were consisted of PCPs (including consultants, specialists, and GPs) working in government PHCs, irrespective of the length of their experience. Physicians working in private sector were excluded. The residents of family practice residency program were also excluded as they were still on training. The study was approved by the Primary Care Research Committee MoH, Bahrain vide their letter No. FH/2017 dated 18 May 2020. The anonymity of participants and confidentiality of data were ensured.

Data was collected via an English language questionnaire adapted from a similar study conducted in Saudi Arabia.[9] The questionnaire was piloted on 20 physicians in Bahrain to assess clarity and response time and rate. Two more questions were added and an existing one was modified to improve language, based on the pilot study findings. The reliability of the questionnaire was tested and showed a Cronbach's alpha of 0.818.

The finalized questionnaire had three parts. Section 1 sought demographic data of the participants and their adherence to guidelines [Tables 1 and 2]. Section 2 focused on the barriers and facilitators assessment tool [Table 3], while Section 3 enquired about any additional barriers and facilitators for implementing CPGs [Table 4]. The questionnaire and a consent form were distributed to all the physicians working in the preselected 20 PHCs through SurveyMonkey.

Data were analyzed using IBM SPSS Statistics for Windows (IBM Corp. Released 2015. IBM SPSS Statistics for Windows, Version 23.0. Armonk, NY: IBM Corp.). Frequencies and percentages were computed for the categorical variables. Means and SDs were computed for the quantitative variables. Chi-square test was used to determine the significance of the relationship between two categorical variables. Kruskal-Wallis test was used to establish the significance of differences in mean scores between more than two groups. A p-value of < 0.05 was considered statistically significant.

RESULTS

Of the 179 PCPs invited, 149 participated (response rate = 83.2%), out of whom 143 physicians answered the questionnaire in full.

Nearly half of the participants were family physician consultants (44.3%), followed by specialists (40.3%). Most participants were female

Table 1: Demographic characteristics of participating primary care physicians (N = 149).

Characteristics	n (%)
Role in primary care centre	
Family physician consultant	66 (44.3)
Family physician specialist	60 (40.3)
General practitioner	23 (15.4)
Gender	
Male	32 (21.5)
Female	117 (78.5)
Nationality	
Bahraini	131 (87.9)
Non-Bahraini	18 (12.1)
Level of formal training	
Family physician residency program	121 (81.2)
No postgraduate training	12 (8.1)
Other specialty programs	16 (10.7)
Working experience, years	
0–5	44 (29.5)
6–10	28 (18.8)
11–15	33 (22.1)
16–20	18 (12.1)
> 20	26 (17.4)
Health region in Bahrain	
Region 1	28 (18.8)
Region 2	18 (12.1)
Region 3	39 (26.2)
Region 4	23 (15.4)
Region 5	41 (27.5)

Table 2: Implementation of daily clinical practice guidelines by primary care physicians and their reasons for the same.

Details	Implementation level, n (%)
Overall implementation	146 (98.0)
Guidelines	
Diabetes mellitus	136 (91.3)
Hypertension	121 (81.2)
Hyperlipidemia	104 (69.8)
Bronchial asthma	89 (59.7)
Antenatal care	85 (57.0)
Thyroid disease	77 (51.7)
Child screening	76 (51.0)
Preventive care screening	71 (47.7)
Women screening	68 (45.6)
Postnatal care	58 (38.9)
Reasons for implementing guidelines	
Evidence-based guideline	118 (79.2)
Address most clinical scenarios seen in my daily practice	65 (43.6)
Obligated by our institution/ department head	47 (31.5)
Easy layout and user friendly	43 (28.9)
Recommended by a colleague	15 (10.1)

(78.5%). With regards to the level of formal training, 121 (81.2%) physicians had received training in family physician residency program, while 12 (8.1%) had no postgraduate training. Regarding experience in primary health care, 29.5% had ≤ 5 years and 22.1% had 11–15 years of experience. Demographic characteristics of the participants are given in Table 1.

The vast majority (98.0%) of the participants reported they were implementing the CPGs in their daily practice. The most implemented were the guidelines on diabetes mellitus (91.3%), hypertension (81.2%), and hyperlipidemia (69.8%). The least implemented were guidelines on postnatal care (38.9%) and women screening (45.6%) [Table 2]. The two most cited reasons for adhering to CPGs were that they were evidence-based (79.2%) and that they addressed most clinical scenarios (43.6%) [Table 2].

A significant relationship was demonstrated between the participant's gender and the implementation of specific guidelines. Male physicians were more adherent to guidelines on hypertension and bronchial asthma than female physicians ($p < 0.040$ and $p < 0.017$, respectively), while guidelines pertaining to antenatal care, postnatal care, and child and women screening were better implemented by female physicians ($p < 0.05$ for all) [Table 3].

The level of formal training was found to be significantly associated with the implementation of guidelines on preventive care, antenatal and postnatal care, and children and women screening. Those trained in the family physician residency program were more likely to implement these guidelines ($p < 0.05$) [Table 3].

Regarding the facilitators towards implementing CPGs, 132 of 143 (92.3%) participants agreed that implementing CPGs was a good starting point for their self-study (4.2±0.7).

When enquired about barriers to CPGs implementation, 111 (77.6%) respondents said they wished to know more about CPGs before applying them (3.8±0.9). However, 117 (81.8%) physicians did not consider reading or remembering guidelines as a barrier (1.9±0.8). Also, most physicians did not find it difficult to adhere to protocols (129; 90.2%;

Table 3: Relationship of primary care physician's gender and level of formal training with the level of adherence to clinical practice guidelines.

Trainings	Gender			Level of formal training			
	Male n = 32 n (%)	Female n = 117 n (%)	*p*-value	Family physician residency program n = 121 n (%)	No postgraduate training n = 12 n (%)	Other specialty programs n = 16 n (%)	*p*-value
Preventive care screening							
Yes	12 (37.5)	59 (50.4)	0.194	65 (53.7)	3 (25.0)	3 (18.8)	0.008
No	20 (62.5)	58 (49.6)		56 (46.3)	9 (75.0)	13 (81.3)	
Diabetes mellitus							
Yes	29 (90.6)	107 (91.5)	1.000	109 (90.1)	11 (91.7)	16 (100)	0.417
No	3 (9.4)	10 (8.5)		12 (9.9)	1 (8.3)	0 (0.0)	
Hypertension							
Yes	30 (93.8)	91 (77.8)	0.040	95 (78.5)	12 (100)	14 (87.5)	0.152
No	2 (6.3)	26 (22.2)		26 (21.5)	0 (0.0)	2 (12.5)	
Hyperlipidemia							
Yes	26 (81.3)	78 (66.7)	0.111	81 (66.9)	10 (83.3)	13 (81.3)	0.286
No	6 (18.8)	39 (33.3)		40 (33.1)	2 (16.7)	3 (18.8)	
Thyroid disease							
Yes	17 (53.1)	60 (51.3)	0.853	62 (51.2)	7 (58.3)	8 (50.0)	0.887
No	15 (46.9)	57 (48.7)		59 (48.8)	5 (41.7)	8 (50.0)	
Bronchial asthma							
Yes	25 (78.1)	64 (54.7)	0.017	69 (57.0)	8 (66.7)	12 (75.0)	0.340
No	7 (21.9)	53 (45.3)		52 (43.0)	4 (33.3)	4 (25.0)	
Antenatal care							
Yes	3 (9.4)	82 (70.1)	< 0.001	81 (66.9)	1 (8.3)	3 (18.8)	< 0.001
No	29 (90.6)	35 (29.9)		40 (33.1)	11 (91.7)	13 (81.3)	
Postnatal care							
Yes	2 (6.3)	56 (47.9)	< 0.001	55 (45.5)	1 (8.3)	2 (12.5)	0.003
No	30 (93.8)	61 (52.1)		66 (54.5)	11 (91.7)	14 (87.5)	
Child screening							
Yes	10 (31.3)	66 (56.4)	0.012	74 (61.2)	0 (0.0)	2 (12.5)	< 0.001
No	22 (68.8)	51 (43.6)		47 (38.8)	12 (100)	14 (87.5)	
Women screening							
Yes	2 (6.3)	66 (56.4)	< 0.001	64 (52.9)	0 (0.0)	4 (25.0)	< 0.001
No	30 (93.8)	51 (43.6)		57 (47.1)	12 (100)	12 (75.0)	

1.6±0.7) or change their old routines (108; 75.5%; 2.1±0.8).

Additionally, 70.6% of physicians did not agree that managers/directors were not cooperative in implementing CPGs (2.2±0.8) while 76.9% denied that CPGs did not fit into their ways of working (2.1±0.9). Further details are given in Table 4.

There was a significant relationship between the participant's role in the clinic and the perception of lack of cooperation from managers/directors in applying CPGs (*p* = 0.028). Specialists were less likely to endorse such barrier (2.4±0.9) than consultants (2.1±0.9) and GPs (1.9±0.6). Most GPs agreed that patients did not cooperate in applying CPGs (*p* = 0.025; 3.4±0.7). There was no significant association between the level of formal training and any of the barriers [Table 5].

The only barrier significantly associated with years of experience was the cooperation from managers/ directors in application of CPGs (*p* = 0.008). Physicians with shorter periods of experience were more likely to perceive this as a barrier than longer-serving colleagues [Table 6].

Table 4: Responses from primary care physicians regarding facilitators and barriers in implementing guidelines, using barriers and facilitators assessment tool (n = 143).*

Items	Disagree n (%)	Neutral n (%)	Agree n (%)	Mean ± SD
Facilitators				
Clinical practice guidelines leave enough room for me to make my own conclusion	9 (6.3)	35 (24.5)	99 (69.2)	3.8 ± 0.8
Clinical practice guidelines leave enough room to weigh the wishes of the patient	20 (14)	49 (34.3)	74 (51.7)	3.4 ± 0.8
Clinical practice guidelines are a good starting point for my self-study	2 (1.4)	9 (6.3)	132 (92.3)	4.3 ± 0.7
The lay-out of clinical practice guidelines makes it handy for use	40 (28)	46 (32.2)	57 (39.9)	3.1 ± 0.9
Barriers				
I did not thoroughly read nor remember the clinical practice guidelines	117 (81.8)	17 (11.9)	9 (6.3)	1.9 ± 0.8
I wish to know more about the clinical practice guidelines before I decide to apply them	14 (9.8)	18 (12.6)	111 (77.6)	3.9 ± 1.0
I have problems changing my old routines	108 (75.5)	24 (16.8)	11 (7.7)	2.1 ± 0.8
I think parts of the clinical practice guidelines are incorrect	91 (63.6)	39 (27.3)	13 (9.1)	2.3 ± 0.9
I have a general resistance to working according to protocols	129 (90.2)	10 (7)	4 (2.8)	1.7 ± 0.7
Other doctors do not cooperate in applying clinical practice guidelines	38 (26.6)	52 (36.4)	53 (37.1)	3.1 ± 1.0
Managers/directors do not cooperate in applying clinical practice guidelines	101 (70.6)	31 (21.7)	11 (7.7)	2.2 ± 0.9
Patients do not cooperate in applying clinical practice guidelines	41 (28.7)	43 (30.1)	59 (41.3)	3.1 ± 0.9
Applying the clinical practice guidelines is too time-consuming	84 (58.7)	29 (20.3)	30 (21)	2.6 ± 1.1
Clinical practice guidelines do not fit into my ways of working at my practice	110 (76.9)	19 (13.3)	14 (9.8)	2.2 ± 0.9
Working according to clinical practice guidelines requires a suitable financial budget	36 (25.2)	30 (21)	77 (53.8)	3.4 ± 1.1
Clinical practice guidelines are not easily accessible in the clinic	80 (55.9)	24 (16.8)	39 (27.3)	2.7 ± 1.1
Clinical practice guidelines are lengthy and not concise/summarized for easy use	37 (25.9)	38 (26.6)	68 (47.6)	3.3 ± 1.1

*Only 143 of 149 participants fully responded to this section of the questionnaire.

DISCUSSION

This study assessed the adherence to various CPGs and explored the barriers to their implementation among PCPs in Bahrain. Overall, there was a high degree of implementation (98.0%) of CPGs among the participants in this study, who also perceived minimal barriers. A similar study in Saudi Arabia also found a considerably high percentage of CPG adherence (88.5%) among PCPs.[9] PCPs in the Netherlands reported a reasonably healthy mean adherence level of 77%.[8] On the other hand, PCPs in China reported poor knowledge and uptake of guidelines in their practice (11.3%).[5] A qualitative study on GPs in Norway also reported low adherence to guidelines.[6]

The high percentage of adherence to CPGs observed in our study could be attributed to the availability of standardized nationally applicable guidelines set by MoH, particularly those related to chronic diseases and womens' health. While in the Norwegian study, physicians were often confused as to which guidelines to follow—local or national.[6]

In the current study, adherence to CPGs varied across gender and the formal training level of the participants. Male physicians were significantly more adherent to implementing CPGs related to hypertension (81.2%) and bronchial asthma (59.7%), while female physicians were significantly more adherent to antenatal care (70.1%), postnatal care (47.9%), child screening (56.4%), and women screening (56.4%). This could be owing to cultural predilections, patients seeking antenatal, or women health services preferring female doctors. This was echoed in a study by Alnaim et al,[9] where female physicians were significantly more likely to adhere to CPGs on female health. The effect of gender on guideline implementation deserves to be more extensively studied.

Graduates of family physician residency program were significantly more likely to implement guidelines pertaining to preventive care screening (53.7%),

Table 5: Relationship between barriers and the physician's role in the primary health care center and level of formal training.

Barrier-related questions	Role in primary health care centre				Level of formal training			
	Family physician consultant	Family physician specialist	General practitioner	*p*-value	Family physician residency program	No post-graduate training	Other specialty programs	*p*-value
I did not thoroughly read nor remember the clinical practice guidelines	1.9 ± 0.9	1.9 ± 0.7	2.2 ± 0.8	0.275	1.9 ± 0.8	2.0 ± 0.5	2.2 ± 1.2	0.579
I wish to know more about the clinical practice guidelines before I decide to apply them	3.9 ± 1.0	4.0 ± 0.9	3.7 ± 1.1	0.686	3.9 ± 1.0	4.1 ± 0.7	3.8 ± 1.1	0.883
I have problems changing my old routines	2.0 ± 0.8	2.3 ± 0.8	2.2 ± 0.9	0.075	2.1 ± 0.8	21.0 ± 0.7	2.1 ± 1.1	0.928
I think parts of the clinical practice guidelines are incorrect	2.3 ± 0.9	2.3 ± 0.9	2.1 ± 0.8	0.516	2.3 ± 0.9	2.2 ± 0.8	1.9 ± 0.8	0.111
I have a general resistance to working according to protocols	1.6 ± 0.7	1.7 ± 0.7	1.9 ± 0.9	0.302	1.6 ± 0.7	2.0 ± 0.9	1.7 ± 0.9	0.361
Other doctors do not cooperate in applying clinical practice guidelines	3.1 ± 1.0	3.2 ± 0.9	2.8 ± 0.9	0.290	3.1 ± 1.0	2.7 ± 0.9	3.1 ± 0.8	0.345
Managers/directors do not cooperate in applying clinical practice guidelines	2.1 ± 0.9	2.4 ± 0.9	1.9 ± 0.6	0.028	2.3 ± 0.9	2.1 ± 0.5	1.9 ± 0.6	0.301
Patients do not cooperate in applying clinical practice guidelines	2.91 ± 1.0	3.3 ± 0.9	3.4 ± 0.7	0.025	3.1 ± 1.0	3.4 ± 0.7	3.1 ± 0.9	0.710
Applying the clinical practice guidelines is too time-consuming	2.5 ± 1.1	2.6 ± 1.0	2.8 ± 1.1	0.477	2.6 ± 1.1	2.9 ± 1.0	2.3 ± 1.0	0.446
Clinical practice guidelines do not fit into my ways of working at my practice	2.1 ± 1.1	2.2 ± 0.9	2.2 ± 0.8	0.237	2.2 ± 1.0	2.4 ± 0.7	2.1 ± 1.0	0.441
Working according to clinical practice guidelines requires a suitable financial budget	3.5 ± 1.0	3.3 ± 1.1	3.4 ± 1.0	0.668	3.4 ± 1.1	3. 5 ± 0.8	3.5 ± 1.1	0.886
Clinical practice guidelines are not easily accessible in the clinic	2.5 ± 1.1	2.8 ± 1.1	2.8 ± 1.3	0.254	2.7 ± 1.1	2.9 ± 1.2	2.4 ± 1.1	0.509
Clinical practice guidelines are lengthy and not concise/summarized for easy use	3.2 ± 1.0	3.3 ± 1.0	3.4 ± 1.2	0.564	3.3 ± 1.0	3.5 ± 1.1	3.1 ± 1.2	0.743

Data were given as mean ± SD.

Table 6: Relationship between perception of barriers and years of experience as a primary care physician.

Barrier-related questions	Years of experience as primary care physician, mean ± SD					p-value
	0–5 years	6–10 years	11–15 years	16–20 years	> 20 years	
I did not thoroughly read nor remember the clinical practice guidelines	1.8 ± 0.7	2.0 ± 0.7	1.7 ± 0.7	2.2 ± 0.9	2.3 ± 1.1	0.057
I wish to know more about the clinical practice guidelines before I decide to apply them	4.0 ± 1.0	3.9 ± 1.2	3.9 ± 0.7	3.9 ± 1.0	3.7 ± 1.1	0.784
I have problems changing my old routines	2.3 ± 0.9	2.2 ± 0.7	2.0 ± 0.7	1.8 ± 0.6	2.1 ± 1.1	0.420
I think parts of the clinical practice guidelines are incorrect	2.5 ± 0.9	2.1 ± 0.8	2.3 ± 0.9	2.1 ± 0.6	2.2 ± 1.1	0.492
I have a general resistance to working according to protocols	1.8 ± 0.7	1.5 ± 0.6	1.7 ± 0.6	1.6 ± 0.8	1.8 ± 1.0	0.586
Other doctors do not cooperate in applying clinical practice guidelines	3.3 ± 0.9	3 ± 1.0	3.2 ± 1.0	2.8 ± 1.0	3.0 ± 0.9	0.289
Managers/directors do not cooperate in applying clinical practice guidelines	2.5 ± 0.9	2.3 ± 0.8	1.9 ± 0.8	2.1 ± 1.0	2.0 ± 0.9	0.008
Patients do not cooperate in applying clinical practice guidelines	3.4 ± 0.9	3.2 ± 0.9	3.27 ± 0.8	2.94 ± 1.0	2.68 ± 1.0	0.060
Applying the clinical practice guidelines is too time-consuming	2.6 ± 1.1	2.6 ± 1.0	2.5 ± 0.9	2.7 ± 1.4	2.4 ± 1.0	0.977
Clinical practice guidelines do not fit into my ways of working at my practice	2.4 ± 1.0	2.1 ± 1.0	1.8 ± 0.6	2.2 ± 1.0	2.2 ± 1.1	0.096
Working according to clinical practice guidelines requires a suitable financial budget	3.3 ± 1.1	3.6 ± 1.1	3.5 ± 1.0	3.6 ± 1.0	3.2 ± 1.1	0.461
Clinical practice guidelines are not easily accessible in the clinic	2.9 ± 1.2	2.6 ± 0.9	2.7 ± 1.2	2.6 ± 1.2	2.12 ± 1.0	0.092
Clinical practice guidelines are lengthy and not concise/summarized for easy use	3.4 ± 1.0	3.4 ± 0.9	3.5 ± 1.1	2.8 ± 0.9	2.9 ± 1.2	0.113

antenatal care (66.9%), postnatal care (45.5%), child screening (61.2%), and women screening (52.9%). This could be due to skills and discipline imparted by their training. A cross-sectional survey conducted in China revealed higher use of guidelines in those with higher educational and professional levels.[5] A 2008 meta-analysis noted that young or less-experienced physicians were more inclined to follow CPGs than those who were older and more-experienced.[10]

Most of our participants saw adherence to CPGs as a good starting point for their self-study. Most (77.6%) also wanted to have a better understanding of CPGs before applying them. This is in line with the findings of the study in Saudi Arabia, indicating that physicians would prefer a more active role in choosing which CPG to implement in their practice post reviewing recommendations rather than passively following imposed protocols. A systematic

meta-review in 2020 revealed education and specific training programs related to guidelines to be the most common facilitators for guideline adherence.[11]

The only barrier toward CPGs implementation found in our study was the physicians' wish to know more about the CPGs before applying them. This was different from the reasons cited by physicians regionally and globally. In Saudi Arabia, lack of leadership and structural support in addition to physicians' lack of awareness and knowledge of CPGs were the main barriers.[9] Whereas in Norway the barriers were CPG overloading, guidelines that were too long and inaccessible, and the perception that guidelines were not matching patients' needs.[6] Physicians in China perceived lack of training and access as common barriers towards implementation of CPGs.[5] In Sweden, lack of time and unavailability of guidelines contributed to low adherence.[12]

Physicians in our study did not endorse the lack of cooperation from managers as an obstacle towards CPGs implementation. This may be due to the fact that most preventive care such as screening, women and child health, and chronic care is supported by the MoH with measures and facilities in place. However, the lack of cooperation from patients was perceived as an impediment to guideline implementation, especially by GPs. Suboptimal skills in patient counseling and communication could be partly responsible for this. Physicians in Germany also attributed patient-related factors and deficiencies in patient-physician relationships among the strongest barriers against adherence to guidelines on type 2 diabetes.[13] The previously mentioned qualitative survey in Norway noted the difficulty in adhering to guidelines when dealing with multimorbid patients, where several guidelines had to be applied simultaneously.[6]

Frequent updates of CPGs based on fresh evidence do improve their quality. However, they also render the guidelines to become lengthy and more complex, impacting their practical utility. In our study, 47.6% of participants endorsed a similar view (albeit without statistical significance). Similar views were expressed in other surveys.[10,14] In an explorative study that sought GPs' and radiologists' perspectives on diagnostic imaging guidelines, the majority agreed that lengthy guidelines and difficulty in finding specific guidelines were barriers to CPGs adherence.[15] Contrastingly, physicians in Estonia did not find guidelines too complicated for use.[16]

Behavioral factors (physician attitude and knowledge), guideline factors (complexity and evidence-based), and external factors (organizational constraints and resources) have been repeatedly noted to influence guideline adherence.[17,18] Other frequently reported barriers in other studies include limitation of time and resources, lack of awareness of guidelines, lack of training, not having a dissemination plan, and unavailability of treatment or diagnostic tests.[19,20]

Finally, we would like to point out that patient management can be complicated by unusual presentations and risk factors which demand a physician's clinical sense and experience, in addition to following clinical guidelines. As pointed out by Vashitz et al,[21] restricting the evaluation of clinical management to guideline adherence may risk undervaluing the physicians' skills and efforts in patient care.

Our results have potentially important implications for improving the quality of healthcare and outcomes for patients. Understanding barriers towards guideline implementation will have a positive effect on guidelines adherence, which can minimize medical errors and unnecessary consumption of resources, thus streamlining the primary healthcare system in Bahrain. Providing easy-to-follow flowcharts, improving guideline search facilities to give targeted results that are readily available, and making CPGs more concise by removing vestiges of obsolete guidelines can help ensure smart and effective decisions in a busy clinic.

This is the first study conducted in Bahrain to look on adherence and barriers to guideline implementation among PCPs. The limitations of the study included the possibility of social desirability bias (even though anonymity was assured), which may have led to some over-reporting of adherence to CPGs and underreporting of barriers. Gender bias was also an important limitation, as most of our participants were female. Finally, the possibility that barriers could vary across individual guidelines was not investigated in our study.

CONCLUSION

Overall, most physicians working in primary healthcare in Bahrain are receptive to CPGs and use them in their daily practice with minimal barriers to their implementation.

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