

Knowledge, attitude, and practice toward evidence-based medicine among hospital physicians in Qassim Region, Saudi Arabia

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ABSTRACT

Objectives: To determine the knowledge, attitude, and practice regarding evidence-based medicine (EBM) among hospital physicians in Qassim region of Saudi Arabia.

Methods: It is a cross-sectional study. A self-administered questionnaire survey was done among 288 physicians working in secondary and tertiary care centers. The study was conducted between June and September 2015.

Results: The overall response rate for the survey was 72%. Majority of the respondents had a positive attitude toward EBM and welcomed the concept. A total of 83% respondents stated that they used EBM in their daily practice and 93.5% agreed that practicing EBM improves patient care. There was a moderate level of awareness regarding extracting information from journals and clinical evidence databases. Although the respondents were aware and demonstrated familiarity with the process of knowledge extraction procedures to determine the best care, as many as 40% did not use them. The respondents had a poor overall understanding of the technical terms used in EBM. Among the respondents, 38.5% thought that the best way to move from opinion-based medicine to EBM was through learning the skills of EBM. The factors that positively affected physician awareness included: Academic qualification and professional title. Knowledge and attitude were affected by qualification, professional title and specialty.

Conclusion: The attitude of most physician practitioners in this study is favorable toward EBM, but this was not correlated with knowledge and awareness. The inclusion of physician training courses in EBM concepts, technical terms and applied practice is highly recommended.

Keywords: Attitude, evidence-based medicine, knowledge, practice Saudi Arabia

Introduction

Evidence-based health care is the educated use of current best evidence in making decisions for individual patient care or health service delivery. Current best evidence is the use of up-to-date information from relevant and valid research regarding the effects of different forms of clinical care, the potential for harm from exposure to the particular agent, the accuracy of diagnostic tests, and the predictive power of prognostic factors.^[1] Evidence-based clinical practice is an

approach to decision-making in which the clinician utilizes the best information available, with patient consent and involvement, to decide on which option is most suitable.^[2]

Evidence-based medicine (EBM) is defined as the “conscientious, explicit, and judicious use of current best evidence.” It involves the utilization of credible evidence in clinical decision-making to provide quality care.^[3] In addition; EBM assists health-care professionals in accommodating the vast amount of literature in any given specialty and aims to

minimize practice variation. Critically appraised scientific material and the relevant applicability of such knowledge in clinical practice are essential.^[4]

Clinicians need to be equipped with; good communication skills as well should have an ethical awareness and familiarity with cultural and social influences on patient encounters. These qualities help physicians to understand patient needs and preferences to manage their illness and choose appropriate interventions.^[5]

It has been reported in many studies that family physicians tend to have positive attitudes^[6-8] toward EBM and a firm belief that it improves patient care. A study conducted by Al-Ansary and Khoja^[9] revealed that the main outcome measures were; physician attitude toward EBM perceived barriers and the best method of changing their opinion from an intuitive decision-making style to a more evidence-based one. This study showed positive attitudes among primary health-care physicians in Riyadh, however, lack of knowledge and use.

A study in the Saudi city of Abha by Al-Musa^[10] assessed the knowledge, perception, attitude, and educational needs of physicians toward EBM. Although their knowledge was deemed acceptable with a welcoming attitude, a noted gap was found between knowledge and practice due to time constraints and resource availability.

Qassim region located in the center of Saudi Arabia nearly 350 km northwest of the capital Riyadh with an estimated population of more than 1.3 million.^[11] Within this area, there is a mix of urban, suburban and rural communities served by governmental and private health-care centers. Despite the availability of an official referral system, the community has open access to all levels of health care, namely, specialty care, without the need for a referral from a primary care center. Since Qassim is connected to all other regions throughout the country by a network of highways, many travelers to the holy cities of Makkah and Madinah pass through the region. Therefore, emergency departments can become overwhelmed with medical and surgical cases making the need for evidence-based care crucial.^[12]

A pioneering study by McColl *et al.*, to assess the views of 452 randomly chosen general practitioners toward EBM in the United Kingdom showed positive attitudes toward EBM.^[6] Multiple international studies support the importance of EBM.^[13-17] In Saudi Arabia, studies on physician attitude and awareness toward EBM have been conducted,^[9,18-20] but to date, data on the practice of EBM among physicians in Qassim region is lacking.

This study aims to determine the knowledge, attitude, and practice of the hospital physicians of the Qassim region toward EBM and their opinion on, how to shift from opinion based to EB medicine. Moreover, this study compares the characteristics

of the respondents in terms of their awareness, knowledge, and attitude.

Methods

This cross-sectional study was conducted in secondary and tertiary health-care centers of the Qassim region including: (1) King Fahd Specialist Hospital-Buraidah and Prince Sultan Cardiac center, (2) Maternity and Children Hospital–Buraidah, (3) Buraidah Central Hospital, (4) King Saud Hospital- Unaizah, (5) Al-Rass General Hospital, (6) Al-Bukairiah General Hospital, and (7) Al-Mithnab General Hospital. Physicians employed by the government were included while privately employed physicians were excluded from the study.

The total number of working physicians in the included hospitals was 1055. Calculated sample size was $n = 282$, with 80% power at 5% α -error, based on the appropriate formulas.^[21] The questionnaire was adopted from McColl *et al.*^[6] with some modification to adapt local setting and was distributed among 400 physicians keeping in view the number of physicians without response. The English-language questionnaire contained 28 items and four sections. The sections included were sociodemographic characteristics, physicians' awareness of some EBM relevant databases, understanding technical terms used in EBM and attitudes toward EBM. In addition, respondents' opinion on how to shift from opinion-based medicine to EBM was included, and open-ended questions were used to assess how EBM could be facilitated further. The paper version of self-administered questioner was randomly distributed in sample population by seven coinvestigators. The study was conducted from June 2015 to September 2015.

Statistical analysis

The collected data were analyzed for significance using Statistical Package for the Social Sciences for Windows (version 19.0). Frequencies with percentage were computed for descriptive analysis. Median central tendency was used for scores of physicians' awareness, knowledge, and attitude, ranging from 6 to 24 for awareness, 10–40 for knowledge, and 7–35 for attitude. Mann–Whitney U test and Kruskal–Wallis test were used to find statistically significant differences between subgroups among the ordinal demographic variables whereas, Chi-square test was used for categorical variables.

Ethical considerations

Participation in the study was totally voluntary. The investigator explained the purpose of the study and the way the survey performs needed to be filled with the participants. Filling the questionnaire was considered an agreement to participate in the study. Respondents were free to withdraw from the study at any time. Confidentiality was maintained throughout the study and respondents were assured that results would be used

only for the research purposes. The study was approved by the Qassim Regional Research Ethics Committee.

Results

A total of 400 questionnaires were distributed, and only 288 questionnaires were completed, which represent response rate of 72%. Table 1 summarizes the baseline characteristics of the respondents [Table 1].

Awareness and perceived usefulness of information sources

Most of the respondents ($n = 158$, 54.8%) had little awareness of EBM resources. Whereas, only 20 (7.0%) respondents had used all the mentioned EBM resources in their clinical decision-making. Table 2 summarizes the respondents' awareness of different well known EBM resources.

Regarding the factors affecting physicians' awareness toward EBM, the results of the current study showed that the highest scores of awareness (median score - 13.0) were attained by the physicians with fellowship qualification. Based on titles, highest median scores (median score - 12.0) of awareness were attained by the consultants [Table 3].

Understanding of technical terms used in EBM

A total of 105 (36.4%) respondents showed some understanding of 70% of the technical terms (e.g., systematic review, odds ratio, meta-analysis, number needed to treat, confidence interval, and heterogeneity). On the other hand, the terms relative risk, absolute risk, and publication bias were poorly understood.

Table 4 summarizes the details of respondents' understanding of common EBM terms. The understanding of technical terms among the respondents reveals the following:

116 (40.3%) have expressed the ability to understand and explain the term relative risk and 117 (40.6%) to describe the meaning of absolute risk.

Most of the respondents ($n = 122$, 42.4%) indicated that they had some understanding of a systemic review. The term odds ratio was fairly well comprehended by 114 (39.6%) physicians, also the term meta-analysis, as 110 (34.6%) respondents demonstrated a degree of understanding. Overall, 37.2% ($n = 107$) of respondents revealed a general ability to explain the term clinical effectiveness to others, including an ability to understand the number needed to treat and its significance ($n = 107$, 37.2%), as well as the idea behind confidence intervals ($n = 121$, 42.0%).

Among the respondents, a significant number ($n = 118$, 40.9%) and ($n = 111$, 38.5%) displayed a lack of understanding

Table 1: Characteristics of respondents: $n=288$

Variables	<i>n</i> (%), unless otherwise specified
Age (mean±SD)	38.7±11.4
Gender	
Male	229 (79.5)
Female	59 (20.5)
Nationality	
Saudi	44 (15.3)
Non-Saudi	244 (84.7)
Qualification	
Bachelor	123 (42.7)
Master degree	74 (25.7)
Fellowship	12 (4.7)
PhD	6 (2.1)
Board certificate	63 (21.9)
Others	10 (2.8)
Title	
Resident	126 (43.7)
Registrar	73 (25.3)
Specialist	63 (21.9)
Consultant	26 (9.1)
Specialty	
Medicine	59 (20.5)
Surgery	71 (24.6)
Pediatric	43 (14.9)
OB/GYN	48 (16.7)
Others	67 (23.3)
Currently enrolled in a training program	
Yes	60 (20.0)
No	228 (80.0)

SD: Standard deviation, OB/GYN: Obstetric and Gynecology

but a willingness to learn the concept of heterogeneity and publication bias, respectively. EBM knowledge was significantly associated with physician title and specialty. Consultants and obstetrics/gynecology physicians had a higher median score (37.0) ($P = 0.033$) [Table 3].

Attitudes toward EBM

Overall, the physicians had a welcoming attitude toward EBM and favored the use of such practice in their day-to-day clinical management. Most physicians also acknowledged that EBM is vital in planning a diagnostic strategy in patient care.

Of the sample, 269 (93.4%) respondents indicated that practicing EBM improves patient care. However, a small number 89 (30.9%) of the respondents believed that EBM is of limited value in clinical practice and it lacks a scientific base. Notably, many respondents 183 (63.5%) agreed that adopting EBM would put more burden on already overworked family practitioners

Table 2: Respondents awareness of various EBM resources *n*=288

EBM resource	Respondents' awareness, <i>n</i> (%)			
	Unaware	Aware but not used	Read	Used to help in clinical decision-making
Bandolier	166 (57.6)	89 (30.9)	18 (6.3)	15 (5.2)
Clinical evidence	95 (32.9)	92 (31.9)	76 (26.3)	25 (8.9)
DynaMed	147 (51.0)	110 (38.2)	22 (7.6)	9 (3.2)
Cochrane database of Systematic Reviews	141 (48.9)	93 (32.3)	39 (13.5)	15 (5.2)
Best practice	88 (30.6)	127 (44.1)	47 (16.3)	26 (9.0)
National guideline clearinghouse	144 (50.0)	91 (31.6)	22 (7.6)	31 (10.8)

EBM: Evidence-based medicine

Table 3: Characteristics of physicians by their awareness, knowledge, and attitude score concerning EBM

Variables	Awareness		Knowledge		Attitude	
	Median	<i>P</i>	Median	<i>P</i>	Median	<i>P</i>
Age						
<30	10.0	0.788	26.0	0.457	8.3	0.401
30-40	10.0		28.0		17.0	
40-50	8.0		22.0		14.0	
≥50	7.0		25.5		16.0	
Gender						
Male	9.0	0.053	26.0	0.358	16.0	0.085
Female	12.0		28.0		15.0	
Qualification						
Bachelor	9.0	<0.001	27.0	0.617	15.0	<0.001
Master degree	8.0		26.0		15.5	
Fellowship	13.0		36.0		17.0	
PhD	6.0		23.0		17.0	
Board certificate	9.0		23.0		16.0	
Others	9.5		24.5		16.5	
Title						
Resident	9.0	0.006	27.0	0.033	15.0	<0.001
Registrar	10.0		23.5		15.0	
Specialist	8.0		27.0		17.0	
Consultant	12.0		37.0		17.0	
Specialty						
Medicine	9.0	0.429	26.0	0.002	16.0	<0.001
Surgery	8.0		22.5		14.0	
Pediatric	10.5		27.5		17.0	
OB/GYN	12.0		32.0		16.0	
Others	10.0		31.0		17.0	
Ever trained in EBM						
Yes	11.0	0.627	27.0	0.293	16.0	0.002
No	9.0		26.0		16.0	

EBM: Evidence-based medicine

[Table 5]. The attitude of physicians when correlated with academic qualification and professional title showed statistically significant association ($P < 0.001$). Physicians with a bachelor or master's degree attained lower scores (15.0 and 15.5 respectively), while physicians with a fellowship or PhD qualification attained higher scores (17.0 and 17.0).

With regard to physician's title, specialists and consultants achieved higher scores (17.0 and 17.0), while residents and registrars achieved lower scores (15.0 and 15.0). Surgeons achieved lowest (median score - 14.0) while pediatricians achieved highest score (median score - 17.0) among all other specialties [Table 3].

Table 4: Respondents' understanding of technical terms: *n*=288

#	Variables	It would not be helpful to me to understand	I don't understand it but wants to	Some understanding	Yes, understood and I could explain to others
1	Relative risk	22 (7.6)	56 (19.4)	94 (32.7)	116 (40.3)
2	Absolute risk	16 (5.5)	58 (20.1)	97 (33.8)	117 (40.6)
3	Systematic review	16 (5.5)	60 (20.8)	122 (42.4)	90 (31.3)
4	Odds ratio	28 (9.7)	80 (27.8)	114 (39.6)	66 (22.9)
5	Meta-analysis	26 (9.1)	78 (27.1)	100 (34.6)	84 (29.2)
6	Clinical effectiveness	18 (6.3)	67 (23.3)	96 (33.3)	107 (37.2)
7	Number needed to treat	20 (6.9)	86 (29.9)	107 (37.2)	75 (26.0)
8	Confidence interval	20 (6.9)	97 (33.7)	121 (42.0)	50 (17.4)
9	Heterogeneity	29 (10.1)	118 (40.9)	101 (35.1)	40 (13.9)
10	Publication bias	30 (10.4)	111 (38.5)	79 (27.4)	68 (23.7)

Table 5: Respondents' attitude toward EBM

#	Variables	Strongly welcomed	Welcomed	Do not know	Not welcoming	Strongly not welcomed
a.	How would you describe your attitude toward the current promotion of EBM?	116 (40.3)	155 (53.9)	13 (4.5)	1 (0.3)	3 (1.0)
	How would you describe the attitude of most of your physician colleagues toward EBM?	48 (16.7)	152 (52.8)	69 (23.9)	14 (4.9)	5 (1.7)
b.	Variables	Extremely useful	Useful	Do not know	Not useful	Extremely useless
	How useful are research findings in your day-to-day management of patients?	85 (29.5)	154 (53.5)	43 (14.9)	4 (1.4)	2 (0.7)
c.	Variables (%)	0–20	21–40	41–60	61–80	81–100
	What percentage of your clinical practice do you feel is currently EBM?	109 (37.8)	62 (21.5)	54 (18.8)	46 (16.0)	17 (5.9)
d.	Variables	Strongly agree	Agree	Do not know	Disagree	Strongly disagree
	Practicing EBM improves patient care	196 (68.2)	73 (25.3)	13 (4.5)	1 (0.3)	5 (1.7)
	EBM is of limited value in clinical practice lacks a scientific base	89 (30.9)	64 (22.3)	28 (9.7)	69 (23.9)	38 (13.2)
	The adoption of EBM, however worthwhile as an ideal, places another demand on already overloaded physicians	106 (36.8)	77 (26.7)	50 (17.4)	44 (15.3)	11 (3.8)

EBM: Evidence-based medicine

Opinions on how best to move from opinion - based to EBM practice

The data show that 124 (43.1%) of the respondents are currently practicing EBM using medical evidence to guide their practice and 149 (51.7%) were interested to improve their evidence-based skills. On the other hand, 116 (40.3%) of the respondents who were not yet using an evidence-driven strategy thought that the best way to move from opinion-based medicine to EBM was by learning the necessary skills to access the medical literature appropriately [Table 6]

Discussion

The overall response rate in this study was 72%, which is considered a good response rate when compared with other studies.^[9,22] Most of the physicians had an overall welcoming attitude toward the practice of EBM, with a 94.2% score. The positive attitude toward EBM shown by physicians in

this study is in accordance with many local studies in Riyadh region^[9] and to many international studies conducted in the United Kingdom^[6] and Australia.^[7] The data generated from such studies provide a positive indication that the use of EBM has garnered a rise in popularity with physicians relying more on quality medical literature to improve patient management. More than 90% of participating respondents agreed that practicing EBM improves patient care. This is slightly higher than the results shown in other studies in the United Kingdom,^[6] Canada,^[23] and Saudi Arabia.^[20]

It is worth to mention that respondents with limited awareness of evidence-based resources and who did not actively utilize the evidence to guide patient care, their number is considerably higher in the Qassim region than the other parts of the Kingdom.^[19,20] Only 7.0% of physicians in this study were found to use EBM resources to help in their clinical decision-making, which is substantially lower when compared to other regions of Saudi Arabia.^[24] This could be secondary to lack

Table 6: Opinions about the methods to move from opinion-based practice to evidence-based medicine

Methods	Opinions, <i>n</i> (%)		
	To learn the skills of EBM	To seek and apply evidence-based summaries	To use evidence-based practice guidelines or protocols
Method that is currently used	107 (37.2)	80 (27.8)	124 (43.1)
Method of interest for future use	149 (51.7)	73 (25.3)	85 (29.5)
Method that is most appropriate in clinical practice	110 (38.2)	62 (21.5)	116 (40.3)

EBM: Evidence-based medicine

of EBM training and educational programs due to lack of academic health-care institution and specialized EBM center in this region. Limited access to EBM resources is also a major constraint toward EBM practice.

Among the respondents, consultants and physicians with higher academic qualifications (fellowship and PhD) showed maximal positivity of attitude toward EBM; this is in contrast with the findings of the study conducted in Makkah region.^[24] Another study was conducted by Al-Omari and Al-Asmary, in the western region of Saudi Arabia, has reported obstetrician-gynecologists as top physicians in awareness and knowledge of EBM among hospitals physicians.^[20]

Many factors that affect physician’s utilization of evidence-based resources were encountered in this study, such as attitude, awareness, and familiarity with medical literature. Implementation of evidence-based practice should, therefore, be directed toward modifiable factors.

To practice EBM, physicians need to understand and use the terms that are frequently encountered during literature review and critical appraisal. In this study, 28.3% of the physicians were found to be familiar with EBM technical terms, while 35.3% showed a lack of understanding. This, may likely be a reason that the medical evidence did not gain popularity among a considerable number of physicians who are involved in patient care.

Up to 40.3% respondents of this study have expressed that learning evidence-based skills are the most appropriate way to shift from opinion-based practice to EBM. Such a finding has also been reported by many other studies.^[9,20,25] Clearly, implementation of EBM in the Qassim region is in its early stages and poses a great challenge.

The main limitations of the current study were the self-administered questionnaire pattern and socially desirable answering. On the other hand, some physicians were working in a specialty which was not their actual specialty such as emergency and critical care. Thus, the results of this study are not generalizable, and further studies in different regions are urged.

Conclusion

The present study shows that most physicians have a positive attitude toward EBM, but it was not correlated with knowledge

and awareness. This study also reveals that physicians in the Qassim region have a poor overall understanding of EBM resources and technical terms.

Training courses or workshops in the form of continuing medical education with an emphasis on the determinants of literature quality and effectiveness should be encouraged to arm physicians with the necessary skills to acquire a standard and safe approach in patient care.

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