Original Article

Awareness, attitude, and practice of evidence-based medicine among primary healthcare physicians in Buraidah, Saudi Arabia

Thamer A. Almatrudi, Unaib Rabbani

Family Medicine Academy, Qassim Health Cluster, Saudi Arabia

Abstract

Context: Evidence-based medicine (EBM) is essential for safe and cost-effective care provision to the population. **Aims:** To assess the awareness, attitude and practices and barriers among primary care physicians about EBM in Buraidah, Qassim. **Settings and Design:** Cross-sectional study in Primary Health Care centers (PHCCs) of Buraidah, Qassim. **Materials and Methods:** The study was conducted among physicians working in PHCCs of Buraidah. Data were collected online through Google forms. **Statistical Analysis Used:** Descriptive analysis was carried out to measure the frequencies and proportions. Chi-square test was used to compare barriers based on gender, academic degree, and experience categories. **Results:** A total of 96 out of 144 physicians (66.7%) responded to the invitation. About 82.3% of the participants welcomed the promotion of EBM and 92% of the physicians knew about concept of EBM. About 94.8% of the physicians agreed that EBM will improve patient outcomes. The reported barriers were; patient load (87.5%), time availability (70.8%), computer availability (33.3%), internet availability (45.8%), and 56.3% stated updated clinical letters, journals, or guidelines are not available. **Conclusions:** This study found that there was high self-reported knowledge about the EBM concept; however, the knowledge about tools was poor. A number of barriers were found such as patient load, time, availability of clinical guidelines and journals and other resources such as internet and computers. Primary care physicians should be trained and facilitated for EBM.

Keywords: Barriers, evidence-based medicine, primary care, saudi arabia

Introduction

Evidence-based medicine (EBM) is the use of best evidence for improving care. EBM needs skills like question formulation, literature review, critical appraisal and also understanding of some statistical terminology and quantitative outcomes to get the best result for practicing EBM in daily clinic.[1] It also helps improve transparency, accountability and value. Finally it leads to improvement in quality of care and overall patient outcomes.[2]

Address for correspondence: Thamer A. Almatrudi, Family Medicine Academy, Qassim Health Cluster, Saudi Arabia.
E-mail: Th-7@hotmail.com

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Studies have shown that healthcare providers acknowledge the importance of EBM in medical practice yet only a small proportion actually has knowledge and skills for EMB and tackle various barriers.[3-5]

Rationale

Primary Health Care (PHC) is the corner stone of any healthcare system. Most of the population health needs are catered by PHC. It is therefore vital to run primary care based on evidence to improve the quality of care, increase efficiency, and improve population's health. Few studies have been done in different parts of Saudi Arabia to assess the knowledge, practices, and

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perceived barriers to EMB among health care providers.[6-8] However, most of these were conducted in hospital settings. In Qassim region, however no such studies were conducted among primary care physicians. The only study done was among hospital physicians.[9] This study therefore was conducted to assess the awareness, attitude, and practice of Evidence-Based Medicine among Primary Health Care Physicians and to determine barriers of EBM practice in Buraidah.

Subjects and Methods

Study setting: The study was conducted in Primary Health Care (PHC) centers of Buraidah city, the capital of Al-Qassim Region in north-central Saudi Arabia in the heart of the Arabian Peninsula. It has a population of about 590,312 people. According to the health administrator in the region, there are 43 primary healthcare centers serving Buraidah city.

Study design:

A cross-sectional study design was adopted to achieve the study objective.

Study population:

All the physicians working in PHC centers of Buraidah.

Study duration:

January 2020 – Dec 2020

Sample size:

Since the total number of physicians working in PHC centers of Buraidah is 144, according to general directorate of health affairs in Qassim region. Therefore, we included all physicians currently working in PHCs in Buraidah city (Male and Female).

Inclusion criteria:

All the physicians currently working in public sector primary healthcare centers of Buraidah.

Exclusion criteria:

Family medicine residents and trainers in Saudi board, physicians who are on vacations or absent on the day of data collection, and those who refused to participate were excluded from the study.

Data collection procedure:

An online self-administrated questionnaire was developed on Google forms. The link of the questionnaire was sent to each participant individually via WhatsApp messenger. A total of three reminders were sent after the first invitation to all the participants 1 week apart. The questionnaire contained five parts containing 32 questions:

First part: Included sociodemographic data includes age, gender, nationality, year of graduation, and qualification.

Second part: Consisted of two subsections to assess the knowledge of physicians about EBM. First sub-section had five direct questions about concept of EBM some sources of EBM. Second subsection evaluated the knowledge of the physicians about some tools of EBM.

Third part: Six questions were designed to assess the attitude of the physicians toward EBM.

Fourth part: This section was about practice of EBM. The physicians were asked from where got help in their clinic and which online database was used. A direct question about formulating a clinical question (PICO) was asked to assess the practice.

Fifth part: Consisted of five direct questions about the barriers.

Ethical Considerations:

The Ethical approval was obtained from the Qassim Regional Bioethics Committee. Permission was taken from director of primary healthcare centers in Al-Qassim region. Each of the participants provided consent. Privacy and confidentiality were completely protected.

Results

Socio-demographics

We sent questionnaire to 144 physicians of PHCs in Buraidah. The response rate was 66.66% (96 participants). The sociodemographic and related characteristics of the participants are described in Table 1. That showed 43.8% of the total participants (n = 96) were male and 56.2% of the participants were female. The mean age of the physicians was 41.76 (SD = 8.98), and the mean of experience in years was 16 (SD = 9.4). According to the nationality, only 13.5% were Saudi and 86.5% were non-Saudi. The sample indicated that more than half of the participants had only MBBS degree (56%), around one third had a Diploma in family medicine (30.2%), a few of the participants had Board in family medicine (11.2%), and only 2.1% of the participants had PhD degree.

Knowledge about EBM

The participants were asked about some of the EBM resources and we found that, 92% know about concept of EBM, 63% know about PubMed, 56% know about EBM from BMJ publishing group, 51%know about the center of EBM from Oxford University, and 46% know about the Cochrane Database of Systematic Reviews (as showed in Table 2). When the physicians were asked to rate themselves about different tools of EBM, the

Table 1: Sociodemographic and characteristic of the participants (*n*=96)

Characteristics	Frequencies	Percentage
Age		
Mean (SD)	41.76 (8.98)	
Gender		
Male	42	43.8%
Female	54	56.3%
Nationality		
Saudi	13	13.5%
Non-Saudi	83	86.5%
Experience		
Mean (SD)	16 (9.4)	
Qualification		
MBBS	54	56.3%
Diploma	29	30.2%
Board	11	11.5%
PhD	2	2.1%

proportion of physicians rated themselves poor was as follows; 40.6% in meta-analysis technique, 21% in test of statistical significance, 36.5% in confidence interval, 56.3% in multiple regression techniques, 34.4% in statistical tests, 33.3% in odds ratios, 17.7% in measures of sensitivity and specificity, and 16.7% in randomized clinical trial designs (as showed in Table 2).

Attitude of the physicians toward EBM

In this study (as showed in Table 3) we found that 82.3% participants welcomed the promotion of EBM, and 55.2% physicians stated that their colleagues welcomed EBM. Regarding EBM attitude, the study revealed that most of the physicians (89.6%) agreed that practicing EBM helpful in their day-to-day management of patients, 94.8% physicians agreed that EBM will improve patient outcomes and of those, 69.2% strongly agreed. When the physicians were asked about the effect of EBM on the Doctor-Patient relationship, 93.8% stated that EBM positively affects, and 89.6% agreed that EBM would reduce healthcare cost.

EBM practices

In this research, the participants were asked about source of information if they needed help in treatment and diagnosis. The results showed that 31.3% got help from senior, 3.2% got help from EBM, 32.3% got help from books, 76% got help from an online database, and 25% got help from colleagues [Table 4]. Among those using online databases, we found that 51% were using PubMed/Medline, 43.8% were using EBM from BMJ Publishing group, 22.9% were using Center of EBM from Oxford University, and 12.5% used Cochrane Database of Systematic Reviews [Table 5]. While we assess the practice only 42.7% of the participants had formulated a clinical question (PICO) [Figure 1].

Barriers

The physicians were asked about different barriers preventing them from practicing EBM. We found that, 87.5% stated patient load, 70.8% stated time availability, 33.3% stated computer availability, 45.8% stated internet availability, and 56.3% stated updated clinical letters, journals, or guidelines are not available [Table 6].

Table 7 shows the comparison of barriers to EBM with respect to gender. We found that there was no significant difference

Table 2: Knowledge of the physicians about evidence based medicine and its tools

Variable	Frequency	Percentage
Knowledge about EBM		
Concept of Evidence-based Medicine		
Yes	92	95.8%
No	4	4.2%
PubMed (MEDLINE)		
Yes	63	65.6%
No	33	34.4%
Evidence-Based Medicine (from BMJ Publishing Group)		
Yes	56	58.3%
No	40	41.7%
Center of Evidence-based medicine (from Oxford University)		
Yes	51	53.1%
No	45	46.9%
Cochrane Database of Systematic Reviews		
Yes	46	47.9%
No	50	52.1%
Knowledge about tools of EBM		
Tests of statistical significance		
Poor	21	21.9%
Moderate	67	69.8%
High	8	8.3%
Metaanalysis techniques		
Poor	39	40.6%
Moderate	48	54.2%
High	9	9.4%
Confidence intervals		
Poor	35	36.5%
Moderate	52	54.2%
High	9	9.4
Multiple regression techniques		
Poor	54	56.3%
Moderate	41	42.7%
High	1	1%
Power of statistical tests and study designs		
Poor	33	34.4%
Moderate	48	50%
High	15	15.6%
Odds ratios		
Poor	32	33.3%
Moderate	53	55.2%
High	11	11.5%
Measures of sensitivity and specificity		
Poor	17	17.7%
Moderate	42	43.8%
High	37	38.5%
Randomized clinical trial designs		
Poor	16	16.7%
Moderate	51	53.1%
High	29	30.2%

Table 3: Attitude of the physicians toward EBM (*n*=96)

Variable	Frequency	Percentage
How would you describe your attitude towards the current promotion of evidence-based medicine?		
Extremely welcoming	34	35.4%
Welcoming	45	46.9%
Neutral	16	16.7%
Unwelcoming	1	1%
How would you describe the attitude of most of your GP colleagues towards evidence-based medicine?		
Extremely welcoming	8	8.3%
Welcoming	45	46.9%
Neutral	37	38.5%
Unwelcoming	5	5.2%
Extremely unwelcoming	1	1%
How useful are research findings in your day to day management of patients?		
Extremely useful	40	41.7%
Useful	46	47.9%
Neutral	7	7.3%
Useless	3	3.1%
Practicing EBM will improve patient outcomes		
Strongly Agree	63	65.6%
Agree	28	29.2%
Neutral	5	5.2%
Practicing EBM reduced healthcare costs?		
Strongly Agree	40	41.7%
Agree	46	47.9%
Neutral	10	10.4%
EBM positively affects patient-doctor relationship		
Strongly Agree	50	52.1%
Agree	40	41.7%
Neutral	6	6.3%

Table 4: Resources for help in diagnosis and treatment (*n*=96)

Resource	Frequency	Percentage
Senior		
Yes	30	31.3%
No	66	68.8%
Evidence-based practice		
Yes	3	3.2%
No	93	96.8
Books		
Yes	31	32.3%
No	60	67.7%
Online database		
Yes	73	76%
No	23	24%
Colleague		
Yes	24	25%
No	72	75%

in terms of patients load, availability of computers, Internet and updated clinical letters, journals or guidelines. However, there was a significant difference in time available as barrier for EBM which was higher for male, 83.3% compared to females, 61.1% (p-value 0.017).

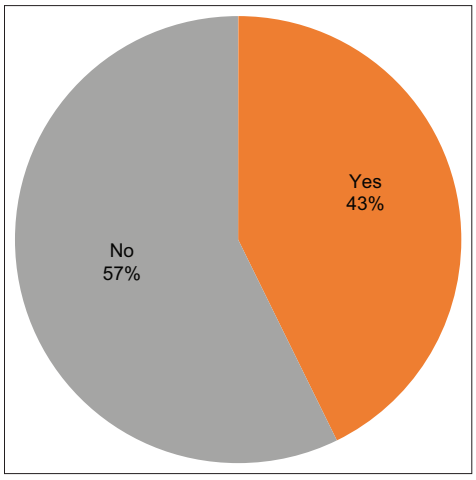

Figure 1: Practice of formulating a PICO question among primary care physicians

Another comparison of barriers to EBM with respect to years of experience of the physicians showed that no significant difference in terms of patients load, availability of computers, Internet and updated clinical letters, journals or guidelines were observed. A significant difference was found in time available as barrier for EBM which was higher for participants with experience less than 15 years 81.2% as compared to participants with experience 15 years and more 60.4% (p-value = 0.025). We also found a significant difference in internet access available as a barrier for EBM, which was higher for participants with experience less than 15 years, 58.3% compared to participants with experience 15 years and more, 33.3% (p-value = 0.014). [Table 7]

Another comparison of barriers to EBM with respect to qualification of the physicians showed that no significant difference in terms of availability of time, computer, Internet access and updated clinical letters, journals, or guidelines were observed. There was a significant difference in patient overload as barrier for EBM, which was higher for participants with MBBS, 96.3% than those with higher than MBBS, 76.2% (p-value = 0.003).

Discussion

This study was conducted among PHC physicians in Buraidah city to assess the awareness and attitude about evidence-based medicine. We found that a great majority of primary care physicians reported having knowledge about EBM. The results also indicated that 82.3% of the participants welcomed the promotion of EBM. However, less than half, 42.7% have ever formulated a clinical question. Patient load and time availability were the most commonly reported barriers.

In this study 96% of the physicians knew about the concept EBM, which is high compared to another study that was done by Al Omari *et al.*[10] in Jordan among PHC physicians revealed 60.9% of physicians know the concept of the EBM. In another study done by Al-Baghlie *et al.*[6] in Dammam, only 39.6% of

Table 5: Frequency of use of different databases by the participants (*n*=96)

Database	Frequencies	percentage
PubMed Medline		
Yes	49	51%
No	47	49%
Evidence-Based Medicine from BMJ Publishing Group		
Yes	42	43.8%
No	54	56.3%
Center of Evidence-based medicine from Oxford University		
Yes	22	22.9%
No	74	77.1%
Cochrane Database of Systematic Reviews		
Yes	12	12.5%
No	84	87.5%
I am not using		
Yes	12	12.5%
No	84	87.5%

Table 6: Perceived barriers prevent the physicians to practice EBM (*n*=96)

Barrier	Frequencies	percentage
Patient load		
Yes	84	87.5%
No	12	12.5%
Time available		
Yes	68	70.8%
No	28	29.2%
Computer available		
Yes	32	33.3%
No	64	66.7%
Internet access available		
Yes	44	45.8%
No	52	54.2%
Updated clinical letters, journals, or guidelines are available		
Yes	54	56.3%
No	42	43.8%

the participants had heard about the concept of EBM. A recent study among Romanian physicians and trainees found poor knowledge about EMB.[11] This high percentage among the physicians in Buraidah PHCs reflect a good understanding of EBM concept.

Knowledge about tools of EBM was also assessed among the participants which showed that 40.6% of physicians were poor in meta-analysis technique, 36.5% were poor in confidence interval, and 33.3% were poor in odds ratios. A study done by Al Omari M *et al*.[10] showed that 34.5% of the participants don not understand meta-analysis, 44% do not understand confidence interval, and 41.2% do not understand odds ratio. The percentage of respondents rating their knowledge as poor is approximately similar. This indicates that there are uniform deficiencies in EBM knowledge. This can be addressed by continuous training of physicians on EBM.

Most of the participants in this study had a positive attitude toward EBM. Most of the physicians (89.6%) agreed that EBM is helpful in their day-to-day management of the patients, improves patient outcomes (94.8%), and will reduce health care costs (89.6%). These findings are in agreement with different studies.[11] A study done by Al-Baghlie *et al*.[6] showed that 81.2% of the participants agreed that EBM improves the patient care, and 69.3% of the participants stated that EBM reduce healthcare costs. A study by Khoja T *et al*.[12] showed that 93% of the participants agreed that EBM practicing improves care of patient and 92% of the participants stated that EBM helpful in their daily practice. Another study done by Alshehri AA *et al*.[9] showed that 90% of participants agreed that patient care would improve with EBM practice. This similarity of attitude of physicians across studies shows the importance of EBM. This indicates the needs to improve and activate the EBM in PHC.

Our study showed different resources of help in treatment and diagnosis, 76% of physicians stated from online database, 32.3% stated from books, and 25% stated from colleagues. Among the online databases, 51% used PubMed, 43.8% used EBM from BMJ Publishing Group, 22.9% used Center of EBM from Oxford University, 12.5% used Cochrane Database of Systematic Reviews. These finding are comparable to reported from a single center in Riyadh, Saudi Arabia.[13] In another study done by Mahmić-Kaknjo M *et al*.[14] it was found that sources of information obtained were; 85.47% from books, 88.5% from colleagues, and 75.14% from internet. We also found that 27% were using PubMed, and 19.8% were using specialized EBM database. When compared this study with the Mahmić-Kaknjo M *et al*.,[14] there was high percentage for online database but this high percentages were not for specialized EBM database. Another study from Croatia reported that only 34% of the physicians had heard about Cochrane library.[15] There are gaps among knowledge, attitude and practices of EBM. Less than half of the participants in our study had ever formulated a PICO question for EBM investigation. This finding aligns with a recent study from Malaysia where only 0.4% of the primary care physicians were good at EBM practice.[16] This calls for interventions to bridge this gap between knowledge and practice of EBM.

This study and many other studies have reported common barriers like patient load, no internet access, lack of time, lack of EBM skills, and lack of resources. Similar barriers were reported by a previous study from Saudi Arabia which included; lack EBM training (73%), facilities (34%), and time available (29%).[17] A study done by Worku T *et al*.[18] showed that 62.1% of the participants do not have access to paid electronic databases, 53.2% do not know where to find research reports, and 51.7% because of lack of both time and interest. Another study done by Al Omari M *et al*.[10] found that effective computer system, absence of library in the locality, lack of scientific media and continuous medical education system, and lack of personal time were the major barriers. The perceived barrier in a study done by Nejašmić D *et al* to 80% of the participants was lack of time.[5] In another study done by Al-Gelban KS *et al*.[7] showed that the

Table 7: Comparison of barriers to EBM with respect to gender, experience, and qualification among PHC physicians in Buraidah, KSA

Barrier	Gender			Experience			Qualification		
	Male %(*n*)	Female %(*n*)	*P*	<15 years %(*n*)	15 years and more %(*n*)	*P*	MBBS %(*n*)	Higher than MBBS %(*n*)	*P*
Patient load									
Yes	85.7 (36)	88.9 (48)	0.641	89.6 (43)	85.4 (41)	0.537	96.3 (52)	76.2 (32)	0.003
No	14.3 (6)	11.1 (6)		10.4 (5)	14.6 (7)		3.7 (2)	23.8 (42)	
Time available									
Yes	83.3 (35)	61.1 (33)	0.017	81.2 (39)	60.4 (29)	0.025	74.1 (40)	66.7 (28)	0.428
No	16.7 (7)	38.9 (21)		18.8 (9)	39.6 (19)		25.9 (14)	33.3 (14)	
Computer available									
Yes	31 (13)	35.2 (19)	0.663	33.3 (16)	33.3 (16)	1.0	27.8 (15)	40.5 (17)	0.190
No	69 (29)	64.8 (35)		66.7 (32)	66.7 (32)		72.2 (39)	59.5 (25)	
Internet access available									
Yes	54.8 (23)	39.9 (21)	0.122	58.3 (28)	33.3 (16)	0.014	42.6 (23)	50 (21)	0.470
No	45.2 (19)	60.1 (33)		41.7 (20)	66.7 (32)		57.4 (31)	50 (21)	
Updated clinical letters, journals, or guidelines are available									
Yes	61.9 (26)	51.9 (28)	0.325	56.2 (27)	56.2 (27)	1.0	61.1 (33)	50 (21)	0.276
No	38.1 (16)	48.1 (26)		43.8 (21)	43.8 (21)		38.9 (21)	50 (21)	

lack of facilities was the main barrier for practicing EBM while the lack of interest was the least barrier. A study done in Tabuk by Altemani AH *et al*.[19] showed that 66.2% of the participants stated no time available, 57.4% of the participants stated no distributed clinical letters, journals, or guidelines, and 35.3% of the participants stated no internet access. This is an important finding that resources are not in access of the care providers which calls health administrator to solve such barriers to improve the care provided in the PHCCs that is well reflect positively on health outcomes.

We did not find differences in most of the barriers with respect to gender, experience, and qualification. A study from Riyadh also reported that there were no differences in reasons for choosing clinical guidelines with respect to gender and experience.[20] This finding indicates that choices and barriers related to EMB practice are more of systems-level rather than individual-level factors. This calls for developing systems to create a conducive environment for EBM practice in primary health care.

There are certain limitations that need to be considered while interpreting the results of this study. Firstly, this study was conducted among primary care physicians of one city only, therefore it may not be generalizable to who region. Secondly, data were collected online using a self-administered questionnaire because of the COVID-19 pandemic. But this is least likely to affect the validity of responses as the study population was physicians. Third, response rate was low (66.6%) despite several personal reminders. This resulted in a small sample size, which may affect the power of our study. Fourth, social desirability bias could also have played role where participants are more likely to respond what is considered appropriate socially in their particular context. Finally, any comparison across studies is arbitrary as the time when studies were conducted, tools used and measurements vary widely across the studies. Nonetheless, we found a very high self-reported knowledge about the EBM concept (95%) but poor knowledge (16%-56%) about the different tools of EBM. PHC physicians had positive attitude for EBM (82%), but the practice was low (43%). Patient load (88%), time availability (71%), and availability of updated clinical guidelines and other resources (56%) were the most common barriers.

Conclusion

This study assessed the awareness attitude and practices of primary care physicians in Buraidah about evidence-based medicine. This study found that there was high self-reported knowledge about the EBM concept; however, the knowledge about tools was poor. The participants have positive attitude towards EBM. Their EBM practicing was poor as only less than half had ever formulated a clinical question based on PICO. This indicates a wide gap between knowledge and practice of EBM. Several barriers were found such as patient load, time, availability of clinical guidelines and journals and other resources such as internet, and computers. We, therefore, recommend further studies on larger scales to provide concrete evidence. EMB should be given priority and made an implicit part of continuing medical education for practitioners. There is also a need of provision of adequate resources to the primary care physicians to practice EBM.

Key Messages

- There is high self-reported knowledge about EMB among primary care physicians.
- Knowledge about the tools of EBM is poor.
- Common barriers to EBM at primary care include: work load, time availability, internet and computer facility and availability of resource materials.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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