

KNOWLEDGE AND ATTITUDE ABOUT EVIDENCE-BASED MEDICINE AMONG FAMILY MEDICINE TRAINEES IN JOINT PROGRAMS OF FAMILY MEDICINE IN MAKKAH REGION: A CROSS-SECTIONAL STUDY

Saja Sultan Alhazmi¹, Mohammed Sultan Alhazmi², Fahad Salman Almajnoni³, Renad Sultan Alhazmi⁴

¹Physician of Family medicine, Primary healthcare in Makkah, KSA

²Paramedic, Hera General Hospital, KSA

³Register Nurse, Project Management Office, KSA

⁴Clinical Pharmacy Student L9, IbnSina College, KSA

Abstract

Background: In the last decade, teaching of the knowledge and skills required for the practice of evidence-based medicine (EBM) is taught through standalone courses and workshops in classrooms away from the clinical practice such as research centers. **Objectives:** To determine the level of knowledge, familiarity with sources and attitude towards Evidence-based Medicine among Family Medicine trainees in Makkah Region 2017 as well as to identify barriers for its practical application. **Subjects and methods:** It was a cross-sectional included a representative sample of Family Medicine trainee enrolled in joint programs of FM in Makkah Region (Makkah, Jeddah, and Taif). A self-administered valid questionnaire was used for data collection, including personal data, opinion, and attitudes of participant towards EBM, knowledge of EBM terms, familiarity and use of electronic EBM sources. **Results:** One hundred and eighty-six Family Medicine residents were included in the study. Exactly two-thirds of them were females. Majority of the participants (97.8%) were Saudis. The overall score of opinion and attitude towards EBM ranged between 22 and 40 with a mean of 34.09 (\pm) 3.19. Female residents expressed higher attitude score towards EBM than male residents (mean rank was 98.91 versus 82.68). This was borderline significant, $p=0.051$. The overall score of familiarity and use of electronic EBM source ranged between 4 and 12 with a mean of 9.80 (\pm) 1.95. R1 residents expressed the highest familiarity and use of electronic EBM source score (mean rank was 104.27) whereas those of R4 level expressed the lowest score (mean rank was 69.07), $p=0.046$. Also, residents of Makkah Family medicine residency program had the highest familiarity, and use of electronic EBM source score (mean rank was 108.93) whereas those of Jeddah program had the lowest score (mean rank was 75.25), $p=0.001$. The overall score of EBM knowledge ranged between 11 and 44 with a mean of 33.51 (\pm) 7.16. Lack of EBM source in the native language, lack of time to access EBM insufficiency of essential EBM skill in most areas of medicine and there is little or no evidence to guide practice were the most frequent barriers for applying EBM in practice.

Conclusion: Overall, family medicine resident physicians in the Makkah Region showed a welcoming attitude towards evidence-based medicine, suboptimal knowledge of EBM some significant terms.

Keywords: Evidence-Based Medicine, knowledge, Family Medicine, 2017, Residents, Makkah Region

1. Introduction

Background/Literature review

There is no doubt that Evidence-based medicine is a significant tool for improvement of the quality of health service for patients. It means integrating individual clinical expertise with the best available external clinical evidence from systematic research. On the other hand, EBM is a merge of the right research evidence and practical experience in the medical and clinical for making the decision for patient care ^(1,2).

As known, many paradigms related to medical practice such as, patient's rights and bed's management. In addition, the Evidence-based practice considered one of them, but it is a new paradigm for patient's care. None can deny Evidence-based medicine is require an individual patients' rights for making the right decisions ⁽³⁾. Furthermore, there are many components of EBM such as, awareness, ability to critically appraise literature and scientific researches that identified as a part of the practice of EBM ⁽⁴⁾. Moreover, the best advantage of EBM is getting better outcomes for the patient, who receive it than those who do not. However, there is a disadvantage of EBM. It encourages for doing rather than thinking. Although, thinking about the way of treatment is one of the tasks performing by the family physician⁽⁵⁾.

In the last decade, teaching of the knowledge and skills required for the practice of evidence-based medicine (EBM) is taught through standalone courses and workshops in classrooms away from the clinical practice such as, research centers. However, evidence-based medicine became a core requirement for family physicians and other physicians in their work and study for improved quality of healthcare ⁽⁵⁾.

According to the Institute of Medicine, RAND, and others have observed the gap between scientifically supported approaches to care and day-to-day practice by clinicians. Perhaps this gap will increase and lead to the problem of non-adherence by providers. In addition, patient's compliance will fall short as noted by researchers ⁽⁶⁾.

Some family medicine trainees believe EBM as a decreasing of the 'art of medicine.' So, there are several limitations and barriers which, prevent implementation of EBM. Moreover, there is an issue regarding the credibility of the evidence was of concern, especially with respect to the influence of wrong medicine. In addition, there are the patient factors lead to the

experience of conflicts. Also, A widespread belief that intuition plays a vital role in primary care reinforced views ⁽⁷⁾.

Educating the standards of EBM to family medicine trainees expands knowledge, enhances basic evaluation abilities and dispositions in the postgraduate setting. Additionally, EBM substance can be conveyed as an independent course, or incorporated into existing exercises inside the medicinal educational programs ^(8,9).

Another study which was held in Thailand, Bangkok with the title of " Evidence-based solution in clinical educational modules" intended to assess the instructing of EBM at the Faculty of Medicine and higher postgraduate center, Ramathibodi Hospital for 3rd- to 6th-year medical students and showed that EBM teaching was useful for medical and higher postgraduate students ⁽¹⁰⁾.

A qualitative study of Norwegian universities, family medicine trainee, tended to apply for evidence-based medicine, and it has a direct influence on decision making of healthcare providers ⁽¹¹⁾.

In a study done in Riyadh among family medicine trainees (PHC) positive attitude was 68%, the percentage of knowledge was 67.6% it was for the measure of central tendency. This study indicates the level of knowledge of family medicine trainee require increasing of applications of evidence-based medicine in healthcare⁽¹²⁾.

In 2008, Almusa conducted research with the title of " Knowledge, perceptions, attitude and educational needs of physicians to evidence-based medicine in South- Western Saudi Arabia "and concluded that the physicians showed an acceptable level of knowledge on EBM. There was a gap between their knowledge and practice of evidence-based medicine. So, this gap could be ascribed to what was tended to by family medicine trainee, insufficiency of time and inaccessibility to the web in their working place⁽¹³⁾.

In a study conducted in Dammam, KSA, for assessment of trainee of family medicine towards evidence-based medicine, there was an overall active attitude towards EBM. Moreover, the study demonstrates that exclusive less than 40% of the family medicine trainee have heard about the concept of EBM ⁽¹⁴⁾.

1.1 RATIONALE

- 1) Importance of EBM for providing better care for patients.
- 2) Personal interest in evidence-based.
- 3) During medical school, we had little exposure to EBM concept and practice.
- 4) Family Medicine trainee should aware and use EBM.
- 5) Up to the researcher knowledge, there were no similar studies in Makkah.

1.2 AIM OF STUDY

1. To evaluate EBM among Family Medicine Trainee.
2. To increase awareness and utilization about EBM among Family Medicine Trainee.

1.3 OBJECTIVES

1. To determine the level of knowledge Family Medicine Trainee in Makkah Region 2017 about Evidence-Based Medicine.
2. To assess their level of knowledge Family Medicine Trainee in Makkah Region 2017 about Evidence-Based Medicine.
3. To inquire about their familiarity and use of electronic EBM sources.

2.METHODOLOGY(MATERIALS AND METHODS)

2.1 StudyDesign

The study design was a cross-sectional.

2.2 Study population

Family Medicine trainees in joint programs of FM in Makkah Region (Makkah, Jeddah, and Taif).

2.2.A Inclusion criteria:

All family medicine trainees who study in the program of FM in (Makkah, Jeddah, and Taif) were eligible for study inclusion.

2.3 Study area

Makkah Region consists of many major cities, Makkah, Jeddah and Taif, and major cities. As known, Makkah considers Islamic land and the holy capital for Muslims around the world. By the way, Jeddah considers the commercial city in the Makkah Region because it contains an Islamic seaport and an international airport (King Abdulaziz airport). The last major city (Taif) is a touristic city because of high mountains and nice weather. Each of the major cities has university and contains several services for the population such as, transportation, education, and health. In addition, every city contains on undergraduate and postgraduate centers for higher studies in different majors. One of the postgraduate programs is Saudi Board of Family Medicine. This program is in three major cities of Makkah Region and contains several trainees for family medicine. For example, the number of trainee in Makkah 103, Jeddah is 138 and Taif is 117. on all levels.

Moreover, in Makkah, the number of the trainee in level one (R1) is 13, level two (R2) is 43, level three (R3) is 30 and level four (R4) is 17 residents. In Jeddah, the number of the trainee in level one (R1) is 47, level two (R2) is 48., level three (R3) is 28 and level four (R4) is 15 residents. Furthermore, in Taif the number of the trainee in level one (R1) is 40, level two (R2) is 34, level three (R3) is 30 and level four (R4) is 13.

2.4 Sample size

The minimum recommended size for the study was 186. However, the researcher added 10% to the sample size to compensate for persons that the researcher is unable to contact.

The sample size was estimated by Raosoft online program according to following characteristics:

- The total population of study was 358
- The prevalence of EBM in FM Trainees was considered to be 50%
- Confidence level 95%
- Error was 5%

2.5 Sampling technique

Stratified random sample with proportional allocation according to the place of training and residency level was adopted. A simple random technique was adopted to select residents from a list of each program and each residency level.

The self-administered questionnaire was used. It has been adopted from Risahmawati and his team (15) who used the same questionnaire for their study "A comparative assessment of attitudes, knowledge and a self-perceived barrier to the practice of evidence-based medicine in Japan and Indonesia."

2.6 Data collection tool (instrument)

The self-administered questionnaire was used. It has been adopted from Risahmawati and his team (15) who used the same questionnaire for their study "A comparative assessment of attitudes, knowledge and a self-perceived barrier to the practice of evidence-based medicine in Japan and Indonesia."

The questionnaire includes the following parts:

- Personal data, this includes the age, gender, level of degree and nationality.
- Opinion and attitudes of participant towards EBM.

Their Opinion and attitude towards the EBM were studied by the eight statements. These statements had Likert responses that a score 1 was assigned for strongly disagree, 2 for disagree, 3 for I don't know, 4 for agree, and 5 for strongly agree. The higher the score, the greater the attitude towards EBM was. Therefore, the score of statement 8 was reversed. The maximum total score is 40 and the minimum is 8.

- Familiarity and use of electronic EBM sources.

Their familiarity and use of electronic EBM sources were studied by the 4 statements. These statements had Likert responses that a score 1 was assigned for unaware, 2 for aware but not use, and 3 for reading. The higher the score, the greater the familiarity and use of electronic EBM sources were. The maximum total score is 12, and the minimum is 4

Reliability:

The self-administered questionnaire was revised by three consultants. During the pilot study, the researcher tested the reliability by test-retest of answers. An average coefficient of correlation of 0.90 has been reported.

2.7 Data Collection Technique

- The questionnaire sheets were distributed by the researcher herself during break or prayer time to avoid the rush hours and not to disturb the trainees.
- The researcher was available to clarify any issue, and the questionnaires were collected at the same time if one of the trainees could not fill the questionnaire at the same time the researcher came again at the end of the day or on another day
- The same process was repeated on the selected center the investigator retrieves all questionnaires.

2.8 Study variables

Dependent variable:

Level of knowledge about EBM, attitude, and familiarity

The researcher used continuous variables for analysis and categorical variables for description.

Independent variables

Personal data:

- 1- **Age.** The researcher used categorical variable as 25-30 and >30 years.
- 2- **Gender.** The researcher used nominal variable by "male and female."
- 3- **Nationality.** The researcher used nominal variable by "Saudi and non-Saudi."
- 4- **Educational status:** The researcher used an ordinal variable as "R1, R2, R3, R4."

2.9 Data Entry and analysis

- Data were entered into personal computer using program SPSS version 21 with a significance of p-value <0.05
- Since the data of attitude, familiarity and knowledge scores were abnormally distributed, as evidenced by significant Shapiro Wilk test ($p < 0.001$), the non-parametric Mann-Whitney test was applied to test for the difference in attitude score between two groups whereas Kruskal-Wallis test was applied to test for the difference between more than two groups. Statistically, a significant p-value was considered if less than 0.05.

2.10 Pilot study /pretesting

Ten percent of sample size was used for carrying out the pilot study in order to test tool, methodology and the environment. No changes were needed.

2.11 Ethical consideration

- Research committee approval.
- Written permission from the Joint program of family medicine in Makkah.
- Written permission from the Joint program of family medicine Jeddah and Taif.
- Individual consent is a prerequisite for data collection.
- Confidentiality was maintained.

2.12 Relevance & Expectations

- 1- Increase knowledge about EBM among FM trainees in Makkah Region
- 2- Increase of EBM practice.
- 3- Increase rate of EBM in Makkah Region.

2.13 Budget Self-funded

3. RESULTS

BACKGROUND CHARACTERISTICS

One hundred and eighty-six Family Medicine residents were included in the study. Table 1 presents their background characteristics. About three-quarters of them (75.3%) were in the age group 25-30 years. Exactly two-thirds of them were females. Majority of the participants (97.8%) were Saudis. Slightly more than one-third of the residents (34.9%) were at the R2 residency level whereas 12.4% were at R4 residency level. Jeddah residency program represents 38.7% of the residents whereas Taif and Makkah represent 32.8% and 28.5% of the participants, respectively.

Table 1: Background characteristics of the participants (n=186)

Characteristics	Frequency	Percentage
Age (years)		
25-30	140	75.3
>30	46	24.7
Gender		
Male	62	33.3
Female	124	66.7
Nationality		
Saudi	182	97.8
Non-Saudi	4	2.2
Residency level		
R1	52	28.0
R2	65	34.9
R3	46	24.7
R4	23	12.4
Place of the residency program		
Makkah	53	28.5
Jeddah	72	38.7
Taif	61	32.8

Opinion and attitude towards EBM

As shown in table 2, all of the residents either strongly agreed or agreed that EBM practice improves patient care. Nearly all of them either strongly agreed or agreed that EBM improves patient outcomes (98.9%) and helps clinical decision making (96.8%). Majority of them either strongly agreed or agreed that EBM could reduce health care costs (74.2%), brings about quick knowledge update (94.6%), should be taught in medical school (91.4%), focused on patient's value (71.5%). Almost half of the residents (49.4%) either strongly disagreed or disagreed that EBM application is difficult in daily practice.

As illustrated in figure 1, the overall score of opinion and attitude towards EBM ranged between 22 and 40 with a mean of 34.09 (\pm 3.19). It is abnormally distributed as evidenced by significant Shapiro Wilk test ($p < 0.001$).

Table 2: Opinion and attitudes of Family Medicine trainees in joint programs of FM in Makkah Region towards EBM

Statement	Strongly Agree N (%)	Agree N(%)	Don't Know N(%)	Disagree N (%)	Strongly Disagree N (%)
EBM practice improves patient care	144 (77.4)	42 (22.6)	0 (0.0)	0 (0.0)	0 (0.0)
EBM improves patient outcomes	120 (64.5)	64 (34.4)	0 (0.0)	2 (1.1)	0 (0.0)
EBM helps clinical decision making	128 (68.8)	52 (28.0)	6 (3.2)	0 (0.0)	0 (0.0)
EBM practice can reduce healthcare Costs	74 (39.8)	64 (34.4)	40 (21.5)	6 (3.2)	2 (1.1)
EBM brings about quick knowledge Update	104 (55.9)	72 (38.7)	8 (4.3)	2 (1.1)	0 (0.0)
EBM focused on patients value	53 (28.5)	80 (43.0)	38 (20.4)	10 (5.4)	5 (2.7)
EBM should be taught in medical School	108 (58.1)	62 (33.3)	10 (5.4)	4 (2.2)	2 (1.1)
EBM application is difficult in daily Practice	10 (5.4)	66 (35.5)	18 (9.7)	78 (41.9)	14 (7.5)

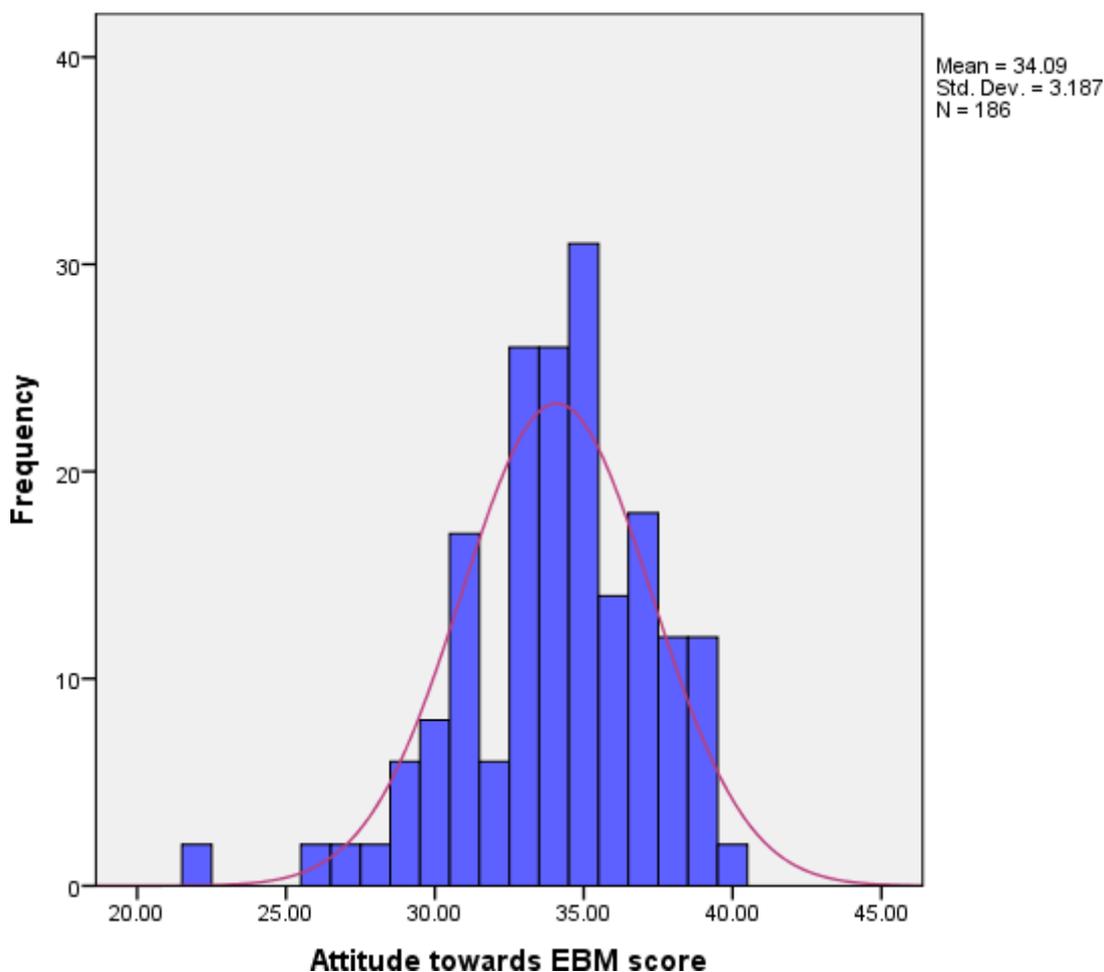


Figure 1: Distribution of the score of opinion and attitude towards EBM among Family Medicine trainees in joint programs of FM in Makkah Region

Factors associated with the attitude towards EBM

As illustrated in table 3, female residents expressed higher attitude score towards EBM than male residents (mean rank was 98.91 versus 82.68). This was borderline significant, $p=0.051$. Other studied factors (age, nationality, residency level and place of the residency program were not significantly associated with residents` attitude towards EBM.

Table 3: Factors associated with opinion and attitude towards EBM among Family Medicine trainees in joint programs of FM in MakkahRegion.

	Attitude score (8-40)			p-value
	Median	IQR	Mean rank	
Age (years)				
25-30 (n=140)	34	33-36	92.98	0.817*
>30 (n=46)	34	30-37	95.09	
Gender				
Male (n=62)	34	30-36	82.68	0.051*
Female (n=124)	35	33-37	98.91	
Nationality				
Saudi (n=188)	34	32.75-36	93.38	0.843*
Non-Saudi (n=4)	34.5	34-35	98.75	
Residency level				
R1 (n=52)	35	31-36	91.17	

R2 (n=65)	34	33-37	97.24	0.872**
R3 (n=46)	34	33-36	93.85	
R4 (n=23)	33	33-37	87.50	
Place of the residency program				
Makkah (n=53)	34	33-35.5	92.79	0.922**
Jeddah (n=72)	34	33-37	95.43	
Taif (n=61)	35	31-36	91.84	

*Mann-Whitney test ** Kruskal-Wallis test

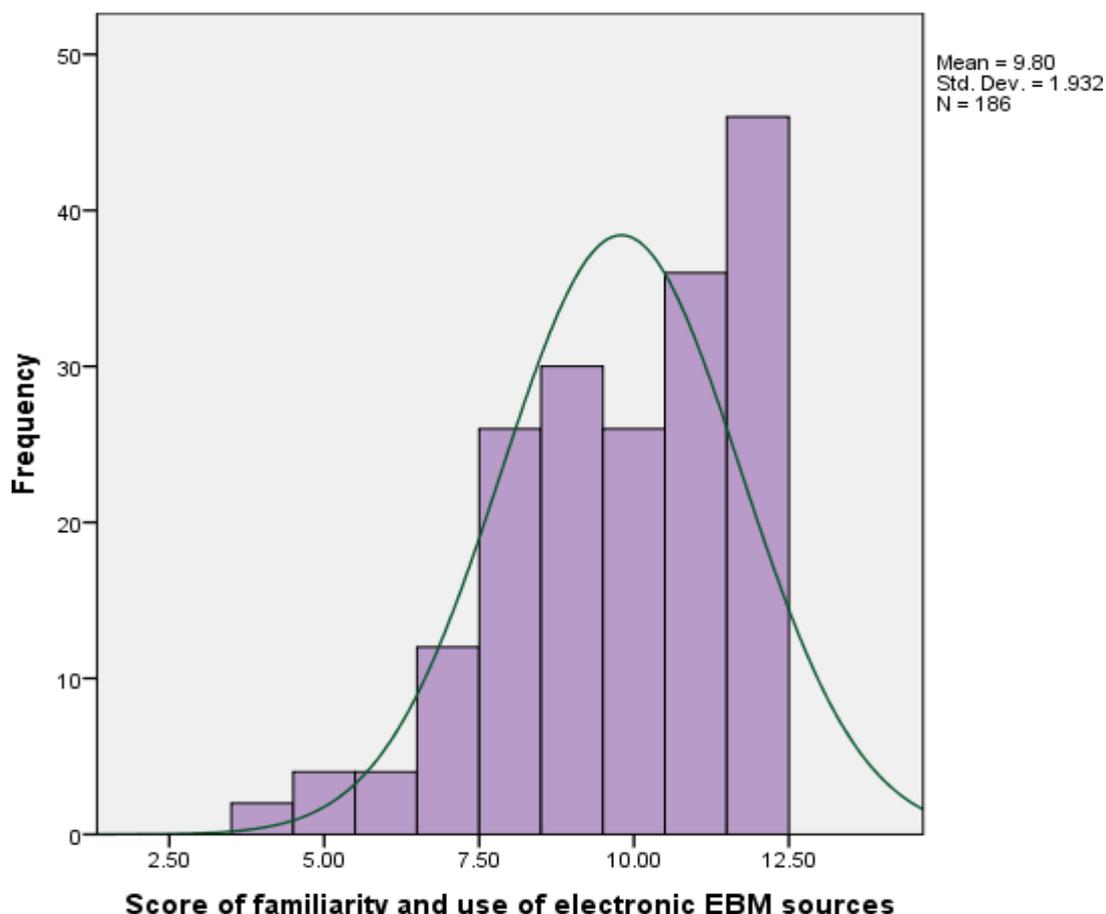
Familiarity and use of electronic EBM sources

It is evident from table 4 that Pubmed/Medline was the most familiar electronic EMB source where 65.6% have usually read it, followed by clinical EBM from the BMJ Publishing Group (62.4%). Cochrane Database of Systematic Reviews (part of Cochrane library) and EBM from the BM Publishing group have been read by 40.3% and 51.1% of the residents, respectively.

As shown in figure 2, the overall score of familiarity and use of electronic EBM source ranged between 4 and 12 with a mean of 9.80 (\pm) 1.95. It is abnormally distributed as evidenced by significant Shapiro Wilk test ($p < 0.001$).

Table 4: Familiarity and use of electronic EBM sources among Family Medicine trainees in joint programs of FM in Makkah Region

	Unaware N (%)	Aware but not used N(%)	Read N(%)
Evidence-based medicine (from the BMJ Publishing Group)	18 (9.7)	73 (39.2)	95 (51.1)
Cochrane Database of Systematic Review (part of Cochrane library)	32 (17.2)	79 (42.5)	75 (40.3)
Pubmed/Medline journal	4 (2.2)	60 (32.3)	122 (65.6)
Clinical evidence (from the BMJ Publishing Group)	20 (10.8)	50 (26.9)	116 (62.4)



Score of familiarity and use of electronic EBM sources

Figure 2: Distribution of the score of familiarity and use of electronic EBM source among Family Medicine trainees in joint programs of FM in Makkah Region **Factors associated with familiarity and use of electronic EBM source**

As evident from table 5, R1 residents expressed the highest familiarity and use of electronic EBM source score (mean rank was 104.27) whereas those of R4 level expressed the lowest score (mean rank was 69.07), $p=0.046$. Also, residents of Makkah Family medicine residency program had the highest familiarity, and use of electronic EBM source score (mean rank was 108.93) whereas those of Jeddah program had the lowest score (mean rank was 75.25), $p=0.001$. Other studied factors (age, gender, and nationality) were not significantly associated with residents' familiarity and use of electronic EBM source.

Table 5: Factors associated with familiarity and use of electronic EBM source among Family Medicine trainees in joint programs of FM in Makkah Region.

	Familiarity and use score (4-12)			p-value
	Median	IQR	Mean rank	
Age (years)				
25-30 (n=140)	10	8-11	90.17	0.135*
>30 (n=46)	11	9-12	103.63	
Gender				
Male (n=62)	11	9-12	102.44	0.104*
Female (n=124)	10	8-11	89.03	
Nationality				
Saudi (n=188)	10	8-12	93.51	0.985*
Non-Saudi (n=4)	10	9-11	93.0	
Residency level				
R1 (n=52)	11	8-12	104.27	0.046**
R2 (n=65)	10	9-11	97.65	
R3 (n=46)	9.5	8-12	87.67	
R4 (n=23)	9	7-11	69.07	
Place of residency program				
Makkah (n=53)	11	9-12	108.93	0.001**
Jeddah (n=72)	9	8-11	75.25	
Taif (n=61)	11	8.5-12	101.63	

*Mann-Whitney test ** Kruskal-Wallis test

Knowledge of EBM Terminology

A considerable percentage of the participants (ranged between 19.4% for the terms of absolute risk and clinical effectiveness to 66.2% for the term sensitivity and specificity) reported that understand these terms and could explain them to others. On the other hand, between 7.5% of the residents (for the term sensitivity and specificity) and 30.1% (for the term clinical effectiveness) reported that they don't understand these terms but would like to. A minority of the residents (ranged between 3.2% for the term sensitivity and specificity and 7.5% for the terms publication bias and sample bias) believed that these terms of no help to them and they had no desire to understand.

As displayed in figure 3, the overall score of EBM knowledge ranged between 11 and 44 with a mean of 33.51 (\pm) 7.16. It is abnormally distributed as evidenced by significant Shapiro Wilk test ($p < 0.001$).

Table 6: Knowledge of EBM terminology among Family Medicine trainees in joint programs of FM in MakkahRegion

Terminology used in EBM paper	It would not be helpful for me to understand N (%)	Don't understand but would like to N (%)	Some Understanding N (%)	Understand and could explain to others N (%)
Relative risk	10 (5.4)	37 (19.9)	97 (52.1)	42 (22.6)
Absolute risk	12 (6.5)	35 (18.8)	103 (55.3)	36 (19.4)
Systematic review	10 (5.4)	19 (10.2)	55 (29.6)	102 (54.8)
Clinical effectiveness	10 (5.4)	56 (30.1)	84 (45.1)	36 (19.4)
Meta-analysis	8 (4.3)	28 (15.1)	56 (30.1)	94 (50.5)
Number need to treat	10 (5.4)	40 (21.5)	60 (32.3)	76 (40.8)
Odds ratio	11 (5.9)	39 (21.0)	90 (48.4)	46 (24.7)
Sensitivity and specificity	6 (3.2)	14 (7.5)	43 (23.1)	123 (66.2)
Confidence interval	12 (6.5)	41 (22.0)	69 (37.1)	64 (34.4)
Publication bias	14 (7.5)	45 (24.2)	85 (45.7)	42 (22.6)
Sample bias	14 (7.5)	43 (23.1)	64 (34.5)	65 (34.9)

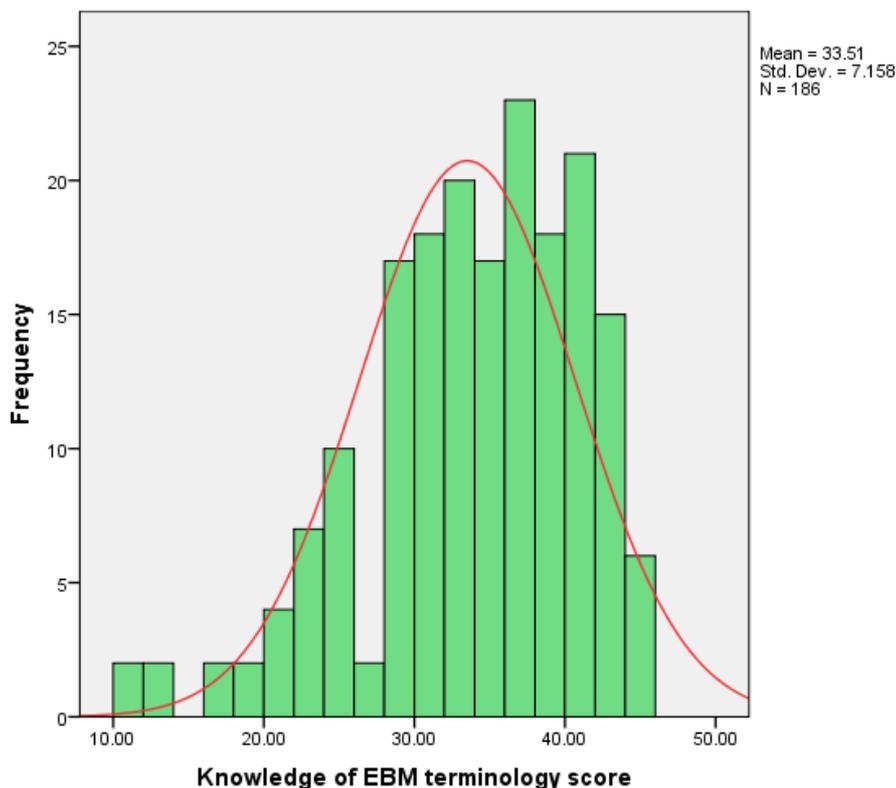


Figure 3: Distribution of the score of Knowledge of EBM terminology among Family Medicine trainees in joint programs of FM in Makkah Region

Factors associated with knowledge of EBM terminology

None of the studied factors (age, gender, nationality, residency level, and place of the residency program) was significantly associated with residents` knowledge of EBM terminology as illustrated from table 7.

Table 7: Factors associated with knowledge of EBM terminology among Family Medicine trainees in joint programs of FM in Makkah Region.

	Knowledge of terminology score (11-44)			p-value
	Median	IQR	Mean rank	
Age (years)				
25-30 (n=140)	34	29-39	93.74	0.916*
>30 (n=46)	34	29.75-38.25	92.77	
Gender				
Male (n=62)	33	28.75-37.25	83.31	0.068*
Female (n=124)	35	30.25-39.75	98.59	
Nationality				
Saudi (n=188)	34	29-39	93.42	0.888*
Non-Saudi (n=4)	35	30-39.25	97.25	
Residency level				
R1 (n=52)	33.50	26.5-39.5	87.41	0.566**
R2 (n=65)	35	29-38.5	90.94	
R3 (n=46)	34	30.75-39.25	99.50	
R4 (n=23)	35	33-39	102.50	

Place of residency program				
Makkah (n=53)	36	30.5-40	104.48	
Jeddah (n=72)	33.5	29-37.75	87.94	
Taif (n=61)	34	29-38.5	90.52	0.205**

*Mann-Whitney test ** Kruskal-Wallis test

Perceived barriers to implement EBM:

Table 8 demonstrates that the most agreed upon barrier to implement EBM in practice according to Family Medicine residents in Makkah Region, KSA were lack of EBM source in native language (weighted mean was 3.68 ± 1.05 on a scale ranged between 1 “strongly disagree and 5 “strongly agree”), followed by lack of time to access EBM (weighted mean was 3.60 ± 1.11), insufficiency of basic EBM skill in most areas of medicine (weighted mean was 3.33 ± 1.06), and there is little or no evidence to guide practice (weighted mean was 3.27 ± 0.98). The least agreed upon barrier was EBM is not applicable to our culture (weighted mean was 2.53 ± 1.11).

Table 8: Perceived barriers to implement EBM among Family Medicine trainees in joint programs of FM in MakkahRegion.

statemet	Strongly AgreeN(%)	Agree N(%)	Don't Know N(%)	Disagree N (%)	Strongly Disagree N (%)	Weighted mean \pm SD
EBM is a new concept	25 (11.8)	64 (34.3)	23 (12.4)	66 (35.5)	8 (4.3)	3.17 \pm 1.18
EBM practice devalues clinical experience and institutions	22 (11.8)	57 (30.6)	45 (24.2)	47 (25.3)	15 (8.1)	3.13 \pm 1.16
EBM is impractical for everyday clinical practice	20 (10.8)	73 (39.2)	31 (16.7)	41 (22.0)	21 (11.3)	3.16 \pm 1.22
EBM removes the “art” of medicine	12 (6.5)	30 (16.1)	35 (18.8)	88 (47.3)	21 (11.3)	2.59 \pm 1.09
EBM de-emphasizes history taking and physical examination skills	14 (7.5)	44 (23.7)	34 (18.3)	71 (38.2)	23 (12.4)	2.76 \pm 1.17
In most areas of medicine, there is little or no evidence to guide practice	16 (8)	70 (37.6)	51 (27.4)	46 (24.7)	3 (1.6)	3.27 \pm 0.98
Lack of time to access EBM sources	35 (18.8)	91 (48.9)	18 (9.7)	35 (18.8)	7 (3.8)	3.60 \pm 1.11
Lack of EBM source in native language	39 (21.0)	83 (44.6)	37 (19.9)	19 (10.2)	8 (4.3)	3.68 \pm 1.05
Insufficiency of basic EBM skill	23 (12.4)	72 (38.7)	40 (21.5)	46 (24.7)	5 (2.7)	3.33 \pm 1.06
EBM is not applicable to our culture	14 (7.5)	25 (13.4)	30 (16.1)	93 (50.0)	24 (12.9)	2.53 \pm 1.11

4. DISCUSSION

Evidence-based medicine is an important growing approach that helps clinicians in searching for updated clinical information, answering practical questions in their clinical practice, appraising the evidence, and applying it in their actual clinical practice(16)

It is essential to assess first the knowledge, familiarity and attitudes towards EBM in order to implement a successful training program for evidence-based medicine Therefore, this study aimed to explore the perceived knowledge, familiarity, attitudes, self-reported barriers of practicing EBM among family medicine residents in the MakkahRegion, Saudi Arabia (Jeddah, Makkah and Taif) as well as identifying the significant independent predictors to be able to define future interventions to improve their evidence-based knowledge and further practice among them and to assess the need of knowledge, attitude, and/or skills targeted courses.

In the present study, evident positive attitude towards evidence-based medicine was reported among family medicine residents in the MakkahRegion Saudi Arabia as all them agreed that EMB practice improves patient care and majorities agreed that EBM improves patient outcomes helps clinical decision making, can reduce healthcare costs, brings about quick

knowledge update, and should be taught in medical school. These findings agreed with those documented in other studies carried out either on the local level⁽¹⁴⁾ or international level⁽¹⁷⁻¹⁹⁾. However, a considerable proportion of them agreed that application of EBM daily practice is difficult. These results are quite similar to those reported in other studies carried out among resident physicians in Korea⁽¹⁷⁾ and Japan⁽¹⁸⁾.

If EBM is not considered in the clinical practice of physicians, it is possible to be at risk of becoming out of date and not benefit to the patients⁽²⁰⁾. A study carried out by Dawes indicated changing the emphasis of postgraduate education from lectures towards training in accessing and interpreting evidence and then putting these skills into practice is a possible way to encourage the practical application of evidence-based medicine⁽²¹⁾.

An understanding of basic epidemiologic methods and statistical tools are essentials for the practice of evidence-based medicine. In the present study, more than half of family medicine residents understood some terminology used in EBM and even able to teach them to others such as systematic review, meta-analysis. Sensitivity and specificity. However, almost one-quarter of them didn't understand some important terms, but willing to learn as odds ratio, number need to treat, publication bias, sample bias, confidence interval, and clinical effectiveness. In agreement with findings of the current study, considerable misunderstanding about terms commonly used in EBM terms was reported in other studies carried out in Saudi Arabia (Riyadh Region)⁽¹²⁾ and (Jeddah Region)⁽²²⁾ as well as in United Kingdom⁽²³⁾ and Qatar⁽²⁴⁾. Keeping in mind these four studies were carried out among primary care physicians, which is the future of family medicine residents. In a study carried out in Japan among family medicine residents, 54% of them understood the basic terminology of EBM, 41% indicated they would like to understand the terminology more and only 3% could explain these terms to others⁽¹⁸⁾. In Korea,⁽¹⁷⁾ nearly 60% of family medicine residents knew the concept of EBM, and 28.5% knew how to estimate the number needed to treat. In the current study, Pubmed/Medline was the most familiar electronic EBM source, followed by clinical EBM from the BMJ Publishing Group whereas Cochrane Database of Systematic Reviews (part of Cochrane library) and EBM from the BM Publishing group have been read by half or less of the family medicine residents. Among family medicine residents in Japan,⁽¹⁸⁾ only the Pubmed/Medline and Clinical evidence from the BJ publishing group were indicated as having been used during clinical decision making.

In the current study, Pubmed/Medline was the most familiar electronic EBM source, followed by clinical EBM from the BMJ Publishing Group whereas Cochrane Database of Systematic Reviews (part of Cochrane library) and EBM from the BM Publishing group have been read by half or less of the family medicine residents. Among family medicine residents in Japan,⁽¹⁸⁾ only the Pubmed/Medline and Clinical evidence from the BJ publishing group were indicated as having been used during clinical decision making. Hachesu reported that most of the residents were familiar with common databases used in EBM, particularly PubMed and Google Scholar, however, Cochrane Database of Systematic Reviews was used poorly⁽¹⁹⁾.

In the present study, it was evident that the residency level was not associated with EBM attitude and knowledge. However, familiarity and use of electronic EBM source was significantly higher among R1 residents. It was expected that senior residents will be more knowledgeable and can work as a trainer in a small workshop to teach junior residents about basic skills in evidence-based medicine.

Unfortunately, this was not the case in the present study. Hachesu et al⁽¹⁹⁾ also reported no significant correlation between residency level and familiarity and use of electronic EBM resources.

In accordance with another study⁽¹⁹⁾, there was no difference between male and female residents regarding knowledge of EBM commonly used terms and familiarity and use of electronic EBM source. However, in the present study, the attitude of the female residents towards EBM was significantly higher than males.

Several experimental studies (randomized and non-randomized) have assessed the impact of training courses of EBM directed to postgraduates and revealed that both basic and advanced courses improved their EBM knowledge⁽²⁵⁾. On the other hand, Guyatt et al concluded that that focusing on training courses in EBM and critical appraisal would be a time consuming and logistically difficult process. Furthermore, it has been reported that not all physicians are interested in attending courses in EBM skills⁽²⁶⁾. Therefore, other methods for disseminating and implementing evidence should be considered such as using evidence-based guidelines or protocols developed by colleagues for use by others and seeking and applying evidence-based summaries⁽²³⁾.

In the present study, the familiarity and use of electronic EBM source score were highest among residents from Makkah Program and lowest among those from Jeddah Program. Further investigation is recommended to confirm and clarify this finding.

The most agreed upon barrier to implement EBM in practice according to Family Medicine residents in Makkah Region, KSA in the current study were lack of EBM source in native language, followed by lack of time to access EBM, insufficiency of basic EBM skill in most areas of medicine, and there is little or no evidence to guide practice. The least agreed upon barrier was EBM is not applicable to our culture. The majority of similar studies in EBM done on young physicians (13, 17, 18) have noted that the major barriers to the use of evidence-based resources were time constraints due to patient load and no access to evidence-based resources.

It has been documented that usually, family medicine residents tend to practice method used by more experienced senior doctors⁽¹⁸⁾. However, the facts found in this study suggest that they are also beginning to welcome the EBM concepts positively. Thus, it is concluded that from one side there is a welcoming acceptance of EBM concepts while at the other side maintaining a practice previously established.

The most prominent limitation of this study is its design as a cross-sectional one implies association and not causality between dependent and independent variables. However, it has some strength.

First, family medicine residents from all the three programs in the Makkah Region were included. Second, the high response rate (100%), which increase the validity of the results.

5. CONCLUSION

Overall, family medicine resident physicians in the Makkah Region showed a welcoming attitude towards evidence-based medicine, suboptimal knowledge of EBM some important terms. Females had more positive attitude towards EBM and were more knowledgeable than males, although not reaching a significant level. The most frequent barriers for EBM application were lack of EBM source in the native language, lack of time to access EBM, insufficiency of basic EBM skill in most areas of medicine, and little or no evidence to guide practice.

6. RECOMMENDATIONS

1. Conduction of regular courses or workshops in evidence-based medicine for family resident physicians in the Makkah Region, Saudi Arabia including the basic searching skills, critical appraisal, principles of EBM and how to incorporate these into daily clinical practice.
2. Providing modern medical library at main hospitals in Makkah, Jeddah, and Al-Taif and even in major primary care centers with free access to the internet.
3. Providing family resident physicians with updated clinical periodicals, journals and guidelines are needed to incorporate EBM into routine daily practice.
4. Excellent time management is highly recommended as each family medicine resident should have own special educational time.
5. Addressing the perceived and real barriers for implementing EBM in general practice should be part of the vision of decision makers.
6. Further research is recommended to assess any improvement achieved.

7. REFERENCESLIST

- 1- Ahmed, M. M. E. (2021). Car-T Cell Therapy: Current Advances and Future Research Possibilities. *Journal of Scientific Research in Medical and Biological Sciences*, 2(2), 86-116. <https://doi.org/10.47631/jsrmb.v2i2.234>
- 2- Sackett DL, Richardson WS, Rosenberg W, Haynes RB. Evidence-based medicine: What it is and what it isn't. *BMJ* 1996; 312(7023):71-72.
- 3- Shuval K; Linn S; Brezis M; Shadmi E; Green ML; Reis S. Association between Primary Care Physicians' Evidence-based Medicine Knowledge and Quality of Care. *International Journal for quality in health care*. 2010;22(1):16-23.
- 4- Mears R, Sweeney K.A preliminary study of the decision-making process within general practice. *FamPract* 2000; 17(5):428-9.
- 5- Farquhar CM, Kofa EW, Slutsky JR. Clinicians' attitudes to clinical practice guidelines: a systematic review. *Med J Aust*. 2002;177:502-506.
- 6- Coomarasam A, Khan KS. What is the evidence that postgraduate teaching in evidence-based medicine changes anything? A systematic review. *BMJ*2004;329:1017.
- 7- Keckley PH. Evidence-Based Medicine in Managed Care: A Survey of Current and Emerging Strategies. *Medscape General Medicine*. 2004;6(2):56.
- 8- Tracy. S, Dantas. G, and Upshur. R, Evidence-based medicine in primary care: qualitative study of family physicians. *BMC Family Practice* 2003, 4:6.
- 9- Bradley P, Oterholt C, Herrin J, Nordheim L, Bjorndal A. Comparison of directed and self-directed learning in evidence-based medicine: a randomised controlled trial. *Medical Education* 2005; 39:1027-1035.
- 10- Parkes J, Hyde C, Deeks J, Milne R: Teaching critical appraisal skills in health care.
- 11- Wanvarie S, Sathapatayavongs B, Sirinavin S, Ingsathit A, Ungkanont A, Sirinan C. Evidence-based medicine in clinical curriculum. *Ann Acad Med Singapore*. 2006 Sep;35(9):615-8.
- 12- Bradley P, Oterholt C, Nordheim L, Bjorndal A. Medical Students' and Tutors' Experiences of Directed and Self-Directed Learning Programs in Evidence-Based Medicine: A Qualitative Evaluation Accompanying a Randomized Controlled Trial. *Evaluation Review* 2005; 29:149-177.
- 13- Al-Ansary LA, Khojai TA. The place of Evidence-based Medicine among primary health care physicians in Riyadh Region, Saudi Arabia. *Family Practice* 2002;19:537- 542.
- 14- Al-Musa HM. Knowledge, perceptions, attitude and educational needs of physicians to evidence based-medicine in South-Western Saudi Arabia. *Saudi Med J*. 2010 Mar; 31(3):308-12.
- 15- Al-Baghlie N, Al-Almaie SM. Physician attitudes towards evidence-based medicine in eastern Saudi Arabia *Annals Saudi Med*. 2004 Nov-Dec;24(6):425- 8.
- 16- Risahmawati RM, Emura S, Nishi T, Widodo DW, Ismail I, Sugioka T, et al. A comparative assessment of attitudes, knowledge and self-perceived barrier to the practice of evidence-based medicine in Japan and Indonesia. *Journal of Medicine and Medical Sciences* 2012 Jan; 3(1): 16-29
- 17- Rajashekhar HB, Kodkany BS, Naik VA, Kotur PF, Goudar SS. Evidence Based Medicine and its impact on medical education. *Indian J. Anaesth*. 2002; 46 (2): 96-103.
- 18- Jo SO, Jo YH, Park EW, Choi EY, Kim, JH, Cheong YS. knowledge and attitude of family medicine residents towards evidence-based medicine. *Korean J Fam Med* 2006; 27(12): 975-981
- 19- Risahmawati RM, Emura SE, Nishi TN, Koizumi SK. Japanese resident physicians' attitudes, knowledge, and perceived

- barriers on the practice of evidence based-medicine: a survey. *BMC Research Notes* 2011, 4:374
- 20- Hachesu PR, Gavvani VZ, Salahzadeh Z, Ehteshami A, Piri Z, Kasaei M, et al. A study of resident's attitude, knowledge and barriers towards the use of evidence based-medicine. *International Journal of Health System and Disaster Management* 2013 Jan- Mar;1(1):38-42
 - 21- Reilly BM. The essence of EBM. *BMJ* 2004;329:991-2.
 - 22- Dawes M. On the need for evidence-based general and family practice. *Evidence-based Medicine* 1996; 1:68–69.
 - 23- Al-Motairy KA, Al-Musa HM. Primary Health Care Physicians' Perceptions, Attitude and Educational Needs Towards' Evidence-Based Medicine. *Biomed Res.* 2013; 24: 257-262.
 - 24- McColl A, Smith H, White P, Field J. General practitioner's perceptions of the route to evidence based-medicine: A questionnaire survey. *BMJ* 1998; 316 (7128):361-365
 - 25- Al-Kubaisi NJ, Al-Dahnaim LA, SalamaRE . Knowledge, attitudes and practices of primary health care physicians towards evidence-based medicine in Doha, Qatar. *East Mediterr Health J.* 2010; 16: 1189-1197.
 - 26- Al-Ananbeh, E., & Al-Wahadneh, A. (2020). Experiences of Family Caregivers' Involvement in Treatment Related-Decision-Making in Triadic Health Encounters. *Journal of Scientific Research in Medical and Biological Sciences*, 1(2), 57-74. <https://doi.org/10.47631/jsrmb.v1i2.36>
 - 27- Coomarasamy A, Khan KS. What is the evidence that postgraduate teaching in evidence-based medicine changes anything? *Systematic review BMJ* 2004;329:1017
 - 28- GuyattGH, Meade MO, Jaeschke RZ, Cook DJ, Haynes RB, clinical epidemiologists. Practitioners of evidence-based care: Not all clinicians need to appraise evidence from scratch but all need some skills *BMJ* 2000;320:954-5