

Research Paper

Knowledge and Attitude of Physicians toward Evidence-Based Medicine

Ammar A. Attar¹, Mohamed M. Khereldeem^{1*}, Bassem Refaat¹ and Hager A. Saleh²

¹ Laboratory Medicine Department, Faculty of Applied Medical Sciences, Umm Al-Qura University, KSA

² Health Management Department, Faculty of Applied Medical Sciences, Umm Al-Qura University, KSA

* Corresponding author, e-mail: (mohamedkhereldeem@yahoo.com)

(Received: 7-2-14; Accepted: 15-3-14)

Abstract: *One of the most consistent findings in health services research is the gap between best practice, on one hand, and actual clinical care, on the other. The aim of this study was to determine physicians' knowledge and attitude about evidence-based medicine. The study was conducted at a general governmental hospital using a self-administered questionnaire administered to physicians. The study has shown that most of physicians had an overall positive attitude towards evidence-based medicine (80.1%). Despite of the low level of awareness about EBM resources' (31.8%), and EBM technical terms (43.3%). The study concluded that despite of physicians' low level of knowledge about EBM resources' and technical terms, they had a positive attitude towards evidence-based medicine. Based on our study we recommend policy makers to Provide hospitals with the required resources for EBM practice and Providing training programs and workshops for physicians to learn EBM skills.*

Keywords: Evidence-based Medicine, Best Practice, Physicians, Attitude, Knowledge.

I. Introduction:

One of the most consistent findings in health services research is the gap between best practice (as determined by scientific evidence), on the one hand, and actual clinical care, on the other. Studies in countries such as the United States and the Netherlands suggest that at least 30%–40% of patients do

not receive care according to current scientific evidence, while 20% or more of the care provided is not needed or potentially harmful to patient. [1]

To overcome this gap, a new paradigm for medical practice is emerging. Evidence-based medicine (EBM) stresses the examination of evidence from clinical research. Medical practice is changing, and the change, which involves using the medical literatures more effectively in guiding medical practice, is profound enough that it can appropriately be called a paradigm shift. A final assumption of the new paradigm is that physicians whose practice is based on an understanding of the underlying evidence will provide superior patient care. [2]

In 1996, Sackett described EBM as “the conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients”. The practice of EBM means integrating individual clinical expertise with the best available external clinical evidence from systematic research. External clinical evidence both invalidates previously accepted diagnostic tests and treatments and replaces them with new ones that are more powerful, more accurate, more efficacious, and safer. [3]

There are several examples that demonstrate the importance of practicing EBM and pitfalls in practicing without the best research evidence. For example physicians had traditionally recommended that babies sleep on their stomachs. In 1980’s, some physicians asked the question: “Is there any evidence to support the practice of sleeping babies on their stomachs?” As it turned out, studies found a dramatic decrease in sudden infant death syndrome deaths among children sleeping on their backs, leading to the national “back to sleep” program. Had someone asked the question 20 years earlier, tens of thousands of lives might be saved? [4]

Use of EBM promotes consistency in individual patient treatments that assume optimal clinical outcomes and improved quality of life. [5]

EBM, still young, faces challenges in integration into clinical practice. The process of producing relevant evidence through high quality research will continue indefinitely, requiring considerable investment by funding agencies all over the world. The process of summarizing that evidence is daunting. Clinicians will also need new reviews and updates for the many thousands of trials completed each year and for observational studies concerning diagnosis, clinical prediction, and harm. [6]

Physicians predictably face difficulties when they try to apply EBM in actual clinical practice. These barriers are: (1) lack of time of physicians (2)lack of access to information (3)Lack of evidence (4)integrating patient values in decision making (5)organizational constraints (6)financial issues. [7]

In the hallmark study by McColl et al. Respondents mainly welcomed EBM and agreed that its practice improves patient care. The major perceived barrier to practicing EBM was lack of personal time. [8]

In the study performed with Belgian social insurance physicians in 2009, the study concluded that although the majority of physicians were positive towards EBM and welcomed more guidelines, the use of evidence and clinical practice guidelines in insurance medicine is low. [9]

In Norway, 2006, only 40% of the respondents reported that their practice had always been evidence-based. Many respondents experienced difficulties in using EBM principles in their clinical practice because of lack of time and difficulties in searching EBM literature. The results of the study indicate that Norwegian physicians have a limited knowledge of the key aspects of EBM but a positive attitude towards the concept. [10]

In Saudi Arabia, 2004, only 39.6% of physicians had heard about EBM. Of those, 65.7% were in favor of EBM and 90.8% had a positive attitude towards EBM. The results revealed that an

understanding of what EBM really was increased awareness of its importance, and how badly it was needed in clinical practice. [11]

In Jordan, 2007, most of the respondents had a positive attitude toward EBM: 63.5% welcomed the concept of EBM; more than 40% used EBM in their daily practices; and 90% agreed that practicing EBM improved patient care. Lack of personal time was the main perceived barrier to practice EBM. [12]

II. Aim of the Work:

A. General Objective:

To determine the knowledge and attitude of physicians towards evidence-based medicine.

B. Specific Objectives:

1. To determine physicians' attitude toward EBM.
2. To determine level of awareness about different EBM resources' and EBM technical terms among physicians.
3. To identify barriers against practicing EBM.

III. Materials and Methods:

A. Study Setting:

The study was conducted in a general governmental hospital, 125-bed affiliated to the ministry of health.

B. Study Design:

Study design is descriptive using cross-sectional approach.

C. Target Population:

Physicians of all clinical departments working in the hospital.

D. Sampling Design:

1. The sample size was calculated according to the following assumptions:
Confidence level= 95%, confidence interval= 5%, population= 175.
The required sample size for these assumptions was 120.
2. The study population was randomly selected from a table of random numbers.

E. Data Collection Tool and Technique:

A self-administered questionnaire was administered to physicians (appendix 1). It was based on the questionnaire developed by McColl et al. [8]

The study tool is composed of five sections:

1. Section 1: Attitude of physicians' towards EBM (Q1-Q6).
2. Section 2: Awareness of physicians about EBM resources' (Q7-Q10).

3. Section 3: Awareness of physicians about EBM technical terms (Q11-Q17).
4. Section 4: Barriers against practicing EBM (Q18-Q30).
5. Section 5: Characteristics of physicians (Q37-Q42).

F. Statistical Analysis:

Descriptive statistics using frequency distribution tables and graphs were carried out. The cut-off point for a favorable attitude towards EBM was mean score more than 5 in section (1). The cut-off point for a good level of knowledge was a total score equals to or more than 13 in sections (2) and (3).

G. Ethical Considerations:

1. The study was conducted after having required permissions from relevant authorities and hospital management.
2. Questionnaires were anonymous.

IV. Results:

Table (1) shows the distribution of the study sample of physicians according to some characteristics. It indicates that the highest percentage of respondents were males (55.4%) who had graduated since 10 years or less (69.5%), and held a Master Degree (43.6%), and had attended a previous literature appraisal skill workshop (63.4%).

Table 1: Personal and professional characteristics of respondents

Characteristic		No. (n=120)	%
Sex	Male	62	55.4
	Female	50	44.6
Years since graduation	≤10years	73	69.5
	>10years	32	30.5
Highest scientific degree	Bachelor	46	41.8
	Diploma	16	14.5
	Master	48	43.6
Attendance of a literature appraisal skills workshop	Yes	66	63.5
	No	38	36.5

Table (2) which shows the mean scores of attitude of physicians towards EBM, indicates that mean scores ranged between 7.8 and 5.5 out of 10. Mean scores were highest with agreement about that practicing EBM improves patient care (7.8) followed by welcoming the current promotion of EBM (7.5), although colleagues were perceived as less welcoming (6.0). On the other hand, estimated percentage of the clinical practice that is currently evidence based had the lowest score (5.5).

Table 2: Mean scores of physicians' attitude towards EBM

Attitude item	Score	
	Mean	SD
Attitude towards current promotion of EBM	7.5	2.1
Perceived attitude of colleagues towards EBM	6	2.2
Perceived usefulness of EBM in day to day management of patients	6.1	2.1
Estimated percentage of respondents' clinical practice that is evidence based	5.5	2.1
Practicing EBM improves patient care	7.8	2.1

Practicing EBM places another demand on already overloaded physicians'	6	2.5
--	---	-----

Figure (1) shows the differences in attitude towards EBM according to personal and professional characteristics. More females had a positive attitude towards EBM (86.0%) in comparison to males (74.2%). According to graduation year, a greater percentage of fresh physicians (≤ 10 years since graduation) showed a positive attitude towards evidence based medicine (86.3%) compared to more experienced physicians (>10 years since graduation) (68.7%). Regarding respondents' highest scientific degree, the percentage of physicians showing positive attitude was highest among those with Bachelor Degree (84.8%) followed by physicians with Diploma Degree (75.0%), and was lowest among physicians with Master Degree (73.0%).

Figure 1: Percentage of physicians with favorable attitude (mean score > 5 out of 10) according to personal and professional characteristics

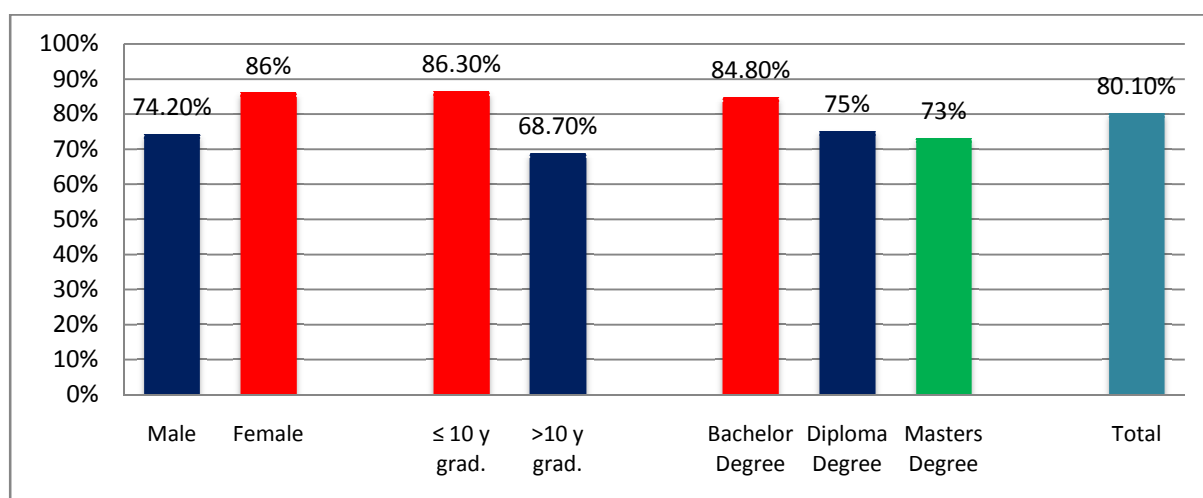


Table (3) shows the level of awareness about different EBM resources' among physicians. As regards pubmed, highest percentage of respondents was for those who were reading it (31.1%) and lowest percentage of respondents was for those who were aware but are not using it (21%). As for national guidelines clearing house, highest percentage was for those who were unaware about it (38.1%) and lowest percentage was for those who were using it to help in clinical decision making (14.4%). Regarding BMJ, highest percentage was equally for those who were reading it and those who were aware but not using it (28.6% each) and lowest percentage was for those who were unaware about it (18.5%). Concerning Cochrane database, highest percentage was for those who were unaware about it (43.2%) and lowest percentage was for those who were reading it (16.9%).

Table 3: Level of awareness of physicians about different EBM resources

Publication	Unaware		Aware but not used		Read		Used to help in clinical DM		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Pubmed	30	25.2	25	21.0	37	31.1	27	22.7	119	100.0
NGC	45	38.1	32	27.1	24	20.3	17	14.4	118	100.0

BMJ	22	18.5	34	28.6	34	28.6	29	24.4	119	100.0
Cochrane	51	43.2	26	22.0	20	16.9	21	17.8	118	100.0

NGC =National guidelines clearing house

BMJ= British medical journal

DM = decision making

Table (4) shows the level of awareness about different EBM technical terms among physicians. Highest percentage of physicians did not understand what relative risk means (42.4%) and only 22% could explain it to others. Similarly, 48.6% did not understand what absolute risk means and only 20.5% could explain it to others. Regarding systematic review, highest percentage of respondents had some understanding of it (43.6%) and lowest percentage was for those who could explain it to others (20.5%). As much as 69.8% of respondents did not understand what odds ratio means and only 11.3% could explain it to others. As for Meta-analysis, 45.3% had some understanding of it and 22.2% could explain it to others. As regards clinical effectiveness, 40.1% did not understand what it means and 22.2% could explain it to others. The highest percentage of respondents had some understanding of number needed to treat (40.7%) and 19.5% could explain it to others.

Table 4: Level of awareness about each EBM technical term among physicians

EBM technical term	It wouldn't be helpful for me to understand		Don't understand but would like		Some understanding		Understand and could explain		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Relative risk	14	11.9	36	30.5	42	35.6	26	22.0	118	100.0
Absolute risk	13	11.1	44	37.6	36	30.8	24	20.5	117	100.0
Systematic review	7	6.0	35	30.0	51	43.6	24	20.5	117	100.0
Odds ratio	17	16.0	57	53.8	31	29.2	12	11.3	106	100.0
Meta analysis	8	6.8	30	25.6	53	45.3	26	22.2	117	100.0
Clinical effectiveness	4	3.4	43	36.7	44	37.6	26	22.2	117	100.0
Number needed to treat	5	4.2	42	35.6	48	40.7	23	19.5	118	100.0

Figure (2) compares the level of knowledge about EBM resources and EBM technical terms according to personal and professional characteristics. Regarding gender, the percentages of females that had a good level of knowledge (46.8%) was higher than that for males (36.7%). According to graduation year, percentage of fresh physicians' (≤ 10 years elapsed since graduation) with good level of knowledge (47%) was higher than percentage of more experienced physicians (> 10 years elapsed since graduation) (33.3%). According to respondents' highest scientific degree, percentage of

physicians with good level of knowledge was highest among those holding Diploma Degree (50%) followed by those with Bachelor Degree (45.7%) and was least among physicians' with Master Degree (31.1%).

Figure 2: Percentage of physicians with good level of knowledge (score ≥ 13 out of 26) about EBM resources' and EBM technical terms according to personal and professional characteristics

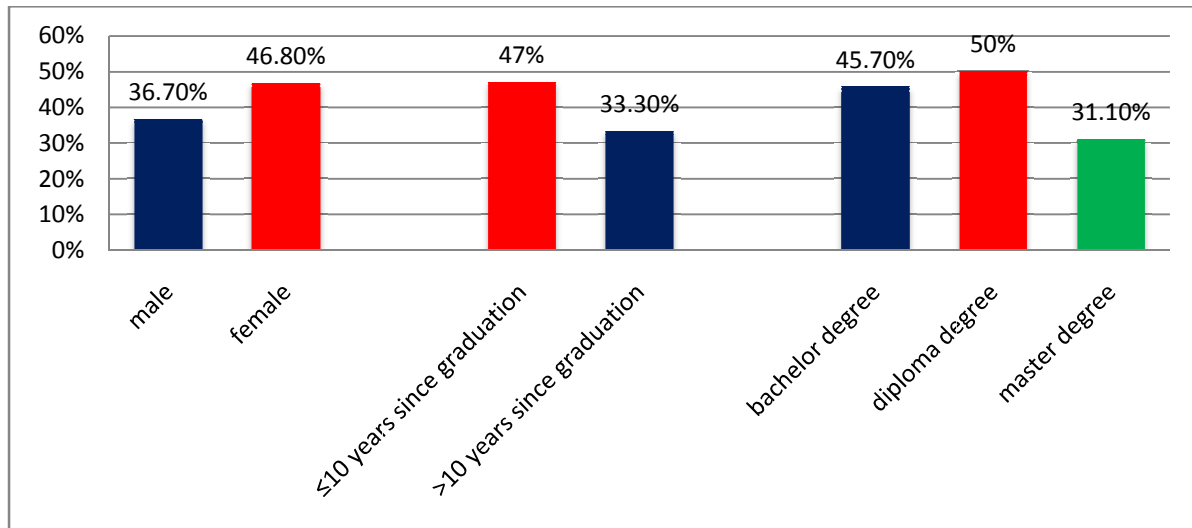


Figure (3) shows the perceived barriers against practicing EBM among physicians. Most common barrier reported by physicians was lack of EBM skills (82.5%) followed by lack of time (75.8%) and by lack of resources (64%). Lowest barrier reported was social factors and legislation restricting the usefulness of evidence (29.2%).

Figure 3: Perceived barriers against practicing EBM among physicians

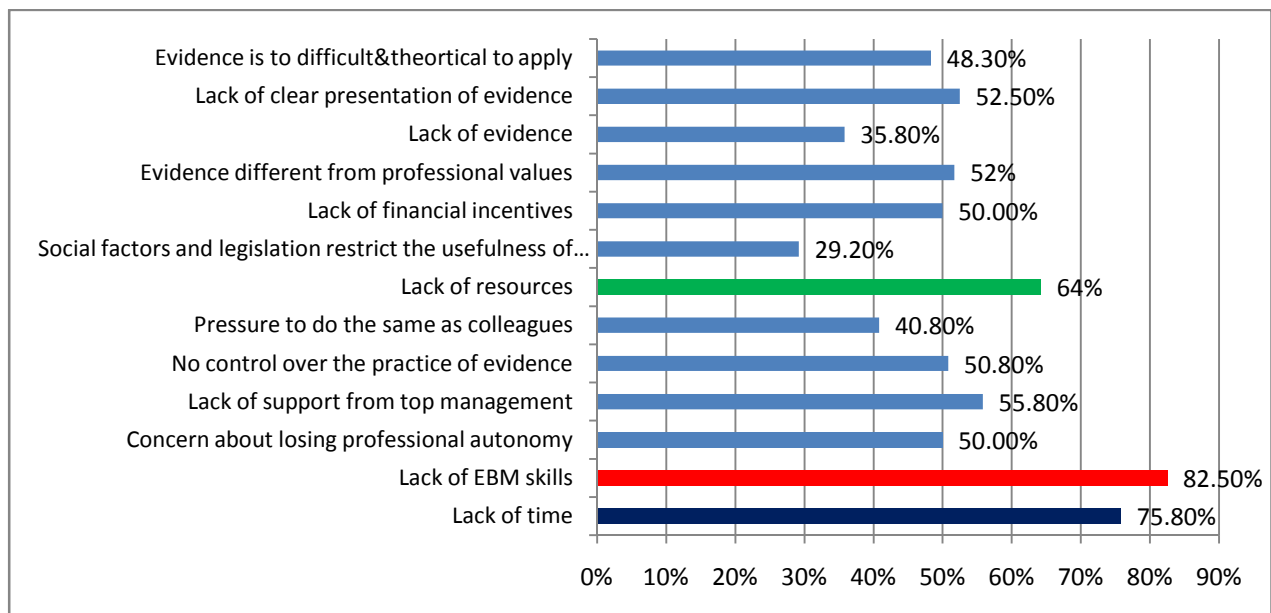


Table (5) shows the perceived 3 most important barriers against practicing EBM. It shows that the barrier most frequently selected by respondents as the first most important barrier against practicing EBM was lack of time (35.5%), followed by lack of EBM skills (20.9%) and lack of resources (9.1%); these 3 barriers being selected as one of the 3 most important barriers in 18.8%, 18.1% and

13.4% of times respectively. The barrier least frequently selected as one of the 3 most important ones was lack of evidence (1.9%) followed by pressure to do as colleagues (3.2%).

Table 5: Perceived three most important barriers against practicing EBM

Barrier	1 st (n=110)		2 nd (n=108)		3 rd (n=96)		Total (n=314)	
	No	%	No.	%	No	%	No.	%
Lack of time	39	35.5	11	10.2	9	9.4	59	18.8
Lack of EBM skills	23	20.9	22	20.4	12	12.5	57	18.1
Losing professional autonomy	11	10	4	3.7	3	3.1	18	5.7
Lack of support from top management	6	5.5	15	13.9	5	5.2	26	8.3
No control over the practice of evidence	4	3.6	7	6.5	3	3.1	14	4.4
Pressure to do the same as colleagues	2	1.8	6	5.5	2	2.1	10	3.2
Lack of resources	10	9.1	20	18.5	12	12.5	42	13.4
Social factors	3	2.7	3	2.8	3	3.1	9	2.9
Lack of financial incentives	5	4.5	4	3.7	12	12.5	21	6.7
Evidence different from professional value	3	2.7	5	4.6	6	6.2	14	4.4
Lack of evidence	0	0	2	1.8	4	4.2	6	1.9
Lack of clear presentation of evidence	2	1.8	6	5.5	11	11.4	19	6
Evidence too difficult & theoretical	2	1.8	3	2.8	14	14.6	19	6

V. Discussion:

This study has shown that most of physicians had an overall positive attitude towards evidence-based medicine with 80.1% scoring more than the cut-off point of positive attitude (>5 mean score out of 10). In addition, the mean scores for attitude ranged between 5.5 and 7.5 out of 10. However, these results are considered lower than findings in other studies. In a study conducted in Saudi Arabia in 2004, 90.8% of physicians had a positive attitude towards EBM and 81.2% agreed and strongly agreed that care given to patients could be improved by using EBM.[11] In Jordan in 2007, 90% of physicians had a positive attitude towards EBM and 90% agreed that practicing EBM improves patient care.[12] In UK, median value for the agreement on that practicing EBM improves patient care was 70[8]. But these comparisons have several limitations as cut-off points used to define what the positive attitude is and what it is not are different between studies.

Female doctors were more welcoming towards EBM than male doctors (86% and 74.2% of respondents who had a favorable attitude towards EBM respectively). Fresh doctors were more welcoming than more experienced doctors (86.3% and 68.7% of respondents who had a favorable attitude towards EBM respectively). Physicians with bachelor degree had the highest percentage of favorable attitude (84.8% of respondents who had a favorable attitude). These results could be interpreted in the light of barriers against practicing EBM revealed by our study. Lack of EBM skills and lack of time were the most frequent reported barriers (12.9% and 11.9% respectively). Female

doctors may have more time to search and read EBM publications than male doctors. Also fresh physicians and physicians with bachelor degree may have a greater ability and more eagerness to learn EBM skills and how to use the internet to search EBM publications than more experienced physicians.

Despite of this positive attitude and agreement about that practicing EBM improves patient care; low level of awareness about EBM resources' has been noted. Thus, 31.8% of physicians were unaware of EBM resources' and only 19.8% of physicians used EBM resources to help in their clinical decision making. Also, a low level of awareness about EBM technical terms has been noted. Only 19.6% of physicians understood EBM technical terms and could explain them to others and 43.3% did not understand EBM technical terms.

This already low level of knowledge might be an overestimate of the actual knowledge as questions were subjective and we do not know actually if respondents who said that they knew EBM technical terms actually knew them or not. Actual level of knowledge might be lower than results in this study. A quiz asking about EBM technical terms' definitions should be included in further studies to assess the actual level of knowledge. But, as a good sign, 80.8% of those who said that they do not understand EBM technical terms expressed willingness to learn. We see this as a chance for improvement.

Similar discrepancies between attitude and knowledge about EBM have been reported in other studies. In Saudi Arabia less than 10% of physicians used EBM resources' in their clinical decision making despite the fact that 93% of them agreed that practicing EBM improves patient care.[13] In Jordan, 43.3% of physicians had little awareness of EBM resources and less than 10% had used EBM resources in their clinical decision making while 90% of them agreed that practicing EBM improves patient care.[12]

Female doctors were more knowledgeable than male doctors (46.8% and 36.7% of respondents who had a good level of knowledge respectively). Fresh doctors were more knowledgeable than more experienced doctors (47% and 33.3% of respondents who had a good level of knowledge respectively). Physicians with diploma degree and bachelor degree were more knowledgeable than physicians with master degree. These results correspond to the attitude of each category. Physicians who had a more favorable attitude towards EBM were more knowledgeable about its resources' and technical terms. This positive relationship between knowledge of EBM and attitude towards EBM was concluded also in Saudi Arabia.[11]

Multiple barriers against integration of EBM into clinical practice led to this discrepancy between attitude and knowledge of physicians towards EBM. Lack of EBM skills was the main perceived barrier (82.5%). This might be attributed to insufficient training courses to learn EBM skills (36.5% of respondents never attended a literature appraisal skills workshop). Lack of time to search EBM resources was the second most frequent reported barrier against practicing EBM (75.8%). This might be attributed to heavy workloads as the study setting was a governmental hospital with a flow rate being very high. Also lack of EBM skills made searching the endless researches and publications impossible. Training physicians on how to efficiently search and apply the evidence might offer a solution for them to practice EBM. Lack of resources in the hospital to search EBM resources' was reported as the third most important barrier (64%). Investment in technology to access the evidence is still very limited. Already limited resources make managers resistant to spend money in providing facilities to access the evidence. A top level manager's commitment to support the practice of EBM is a good first step to start to implement EBM in our hospitals.

Other studies revealed similar barriers against practicing EBM. In Belgium, lack of EBM skills was the main barrier against practicing EBM (79%) followed by lack of time (61.9%). But lack of resources was not one of the most important barriers (31%).[9] This might be attributed to that more resources are available to health sector in European countries. In UK, lack of personal time was the main barrier against practicing EBM (71%).[8] In Jordan, lack of time was the main barrier against

practicing EBM (68.8%) followed by lack of investment by health authorities (55.3%).[12] In Saudi Arabia, Patient overload was the main barrier (29.8%) followed by unavailability of a library in the locality (27.9%).[13]

This consensus about barriers against practicing EBM indicates that problems facing physicians are usually similar. Physicians are always overloaded with patients and concerns about losing professional autonomy with the adoption of EBM model are universal. Teaching EBM skills is not a priority in any medical school until few years ago. Resources are limited whatever its amount and competing priorities are increasing with new technologies and new modalities of treatment.

Further studies will be required in the future that should be conducted in more than one hospital to be more representative of physicians and other healthcare provider's attitude.

VI. Conclusions and Recommendations:

Based on the results of the present study, the following may be concluded:

1. Physicians have a positive attitude towards evidence-based medicine.
2. Physicians have a low level of knowledge about EBM resources' and technical terms.
3. A positive relationship exists between attitude towards EBM and knowledge about it.
4. Lack of EBM skills, lack of time and lack of resources are the most important barriers against practicing EBM.

Based on the study findings and conclusions the following recommendations can be suggested:

Commitment from top management supports all the activities that will help the implementation of EBM practice in hospitals. These activities may include:

1. Hospital policies and procedures that address the implementation of EBM practices.
2. Providing the required resources for EBM practice as computers, internet, electronic libraries and access to international publications.
3. Providing training programs and workshops for physicians to learn EBM skills.
4. More flexible work schedules to leave physicians more time to read EBM resources'.
5. Evaluation of physicians' performance according to clinical practice guidelines.

References

- [1] R. Grol and J. Grimshaw, From best evidence to best practice: Effective implementation of change, *Lancet*, 362(2003), 1225-30.
- [2] Evidence-based medicine working group: Evidence-based medicine: A new approach to teaching the practice of medicine, *JAMA*, 268(1992), 2420-4.
- [3] D.L. Sackett, W.M.C. Rosenberg, J.A.M. Gray, R.B. Haynes and W.S. Richardson, EBM: What it is and what it isn't, *BMJ*, 312(1996), 71-2.
- [4] American Academy of Pediatrics Task Force on Infant Positioning and SIDS, Infant sleep position and SIDS in the United States: Joint commentary from the American academy of pediatrics and selected agencies of the federal government, *Pediatrics*, 93(1994), 820.
- [5] S.J. Lewis, B.I. Orland, B.L. Carter, L.G. Hunsicker and R.A. Rodby, An evidence-based approach: The emerging role of renal protection in hypertension, *Program Presented at AMCP 16th Annual Meeting and Showcase*, San Francisco, CA, March 31 (2004).
- [6] G. Guyatt, D. Cook and B. Haynes, EBM has come a long way, *BMJ*, 329(2004), 990-1.
- [7] W. Eric, Challenges to using EBM in daily clinical practice, *Journal of Outcomes Management*, 2(1999), 21-4.
- [8] A. McColl, H. Smith, P. White and J. Field, General practitioners' perceptions of the route to EBM: A questionnaire survey, *BMJ*, 316(7128) (1998), 361-5.

- [9] H. Annemie, D. Peter, A. Bert, V. Stijn and R. Dirk, The attitude of Belgian social insurance physicians towards evidence-based practice and clinical practice guidelines, *Biomedcentral*, 1471-2296-10-64(2009), 1-8.
- [10] L.V. Ulvenes, O. Aasland, M. Nylenna and I.S. Kristiansen, Norwegian physicians' knowledge of and opinions about evidence-based medicine: Cross-sectional study, *PLOS ONE*, 7828(2009), 1-5.
- [11] B. Nadira and M. Sameeh, Physician attitudes towards evidence-based medicine in eastern Saudi Arabia, *Ann Saudi Med.*, 24(6) (2004), 425-8.
- [12] B. Farihan, H. Lana, S. Tania, M.A. Halim and D. Adel, Evidence-based medicine among Jordanian family physicians: Awareness, attitude and knowledge, *Canadian Family Physician*, 55(2009), e6-13.
- [13] T.A. Khoja and L.A. Al-Ansary, Attitudes to evidence-based medicine of primary care physicians in Asir region, Saudi Arabia, *Medical Journal for Middle East*, 13(2)(2007), 410-25.