

Knowledge, Attitude and Practice of Resident Physicians towards Evidence Based Medicine in Mansoura, Egypt

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Abstract

Background: Application of Evidence Based Medicine (EBM) is widely growing as a tool for the best available evidence in decision making in the health care. **Objective:** This study aims to assess knowledge, attitude and practice of resident physician towards EBM and to compare these aspects between residents in a Teaching and a General Hospital in the same city and to determine their educational needs for greater use of EBM in health care. **Method:** This cross-sectional study included 522 residents from two hospitals. Data was collected using a self-administered questionnaire addressing knowledge, attitudes & practices about EBM and to define the barriers to practice it. **Results:** In most aspects, the knowledge, attitude and practice of Mansoura University Hospital residents about EBM was significantly higher than that for Mansoura General Hospital. **Conclusions:** Although there is a high positive attitude among physicians towards EBM, the knowledge and the practice of EBM is still defective.

Key words: Evidence based medicine – Resident physicians – University Hospital – General Hospital

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Introduction

Evidence-Based Medicine (EBM) is the use of the best recent evidences, resulted from valid clinical researches, depending on the patient's health status.¹ The concept of EBM was firstly introduced by Guyatt in 1992² at McMaster University. It was defined by Sackett et al in 1996³ as the explicit, conscientious, and judicious use of the current best evidence in decisions making regarding the patients health care.

The most essential components of EBA are the ability to access, assess, and apply the evidence. Thus, practicing EBM requires training on how & where to search for the best evidence from rich and reliable database, & how to carry out a systematic & purposeful research strategy.⁴ Also it needs a positive attitude, proper data, advanced

communication techniques, and relevant critical appraisal guidelines.⁵

However, lack of knowledge about the best available EBM is considered as one of the main causes of applying various clinical treatments.⁴ The regular practice of EBM ensures the awareness of the healthcare providers about up-to date advanced knowledge thus improved clinical performance.^{6,7}

The practice of EMB in decision making faces many limitations. For example, the shortage of coherent consistent scientific evidence, difficulties in the application of evidence to the patients health care, lack in critical appraisal skills, limited time of the clinicians to practice these skills and inadequate resources to access evidence.^{8,9}

In developing countries, practicing EBM faces a lot of challenges such as lack of

resources, and lack of facilities & inability to perform workshops.¹⁰ Moreover, the unstable, socioeconomic & political circumstances can alert the use of new techniques in clinical practice.¹¹

Although many studies had been conducted to evaluate the awareness & perception of physicians towards practice of EBM in different countries, in Egypt; very little is known about physicians' attitudes and the extent of their skills in EBM, the barriers to changing from opinion based to evidence based practice, & the essential support aiming to incorporate EBM into daily clinical practice. The aims of the current study is to assess the knowledge, attitude & practice (KAP) of resident physicians, to compare between Mansoura University and Mansoura General Hospital residents regarding their KAP about EBM and to determine their educational needs for better use of EBM in the patient health care.

Method

Study design and setting: A cross-sectional comparative study was carried out between April and September 2018 in Mansoura University Hospital (MUH) and Mansoura General Hospital (MGH), Mansoura, Egypt.

Target population: The target population is resident physicians on duty in both hospitals at the study time. There were 283 and 627 residents at MGH and MUH, respectively. In this study there is no definite outcome of interest to be used for sample size calculation. Alternatively, all residents in MGH were involved in the study and 261 (92.2%) of them completed the questionnaire. An equal number of residents were selected

from MUH by a systematic random sample (every 2nd physician).

Study tool: A self-administered anonymous questionnaire adapted from original questionnaire¹² was developed. The questionnaire consists of 4 sections and includes questions covering knowledge, attitudes & practices about EBM as well as the barriers to practice it. The first part of the questionnaire included data about the personal characteristics of the physicians: age, sex, graduation year and years of the practice experience. The second part addressed the knowledge about bibliographic data base & their understanding of the technical terms considering EBM. The third section asks about attitudes towards EBM: welcoming the promotion of EBM, colleagues' attitudes towards EBM, importance of EBM in daily management, benefits of EBM on patient health care & if EBM causes more demands on overloaded clinician. The last part included ways to move from opinion based practice towards EBM and the barriers of the application of EBM faced by the clinicians in obtaining & searching for data and the essential needs to incorporate EBM into daily clinical practice.

The investigators met the residents and explained the purpose of the study; briefly identify different sections of the questionnaire and assured participants for confidentiality. Questionnaire were filled by the participants and recollected by the investigators.

Data analysis

All the collected information was manually reviewed, verified, and coded before entry of the data. Variables were presented as number and percent. Chi-square test was used to compare between the two hospitals. SPSS, version 16 was

Table (1a): Residents' level of understanding of the common technical terms and databases used in EBM

| Knowledge | Total | | MGH (261) | | MUH (261) | | p |
|--|-------|------|-----------|------|-----------|------|--------|
| | No. | % | No. | % | No. | % | |
| Cochrane database of systematic reviews | | | | | | | |
| Unaware | 303 | 58 | 135 | 51.7 | 168 | 64.4 | <0.001 |
| Aware but not used | 111 | 21.2 | 78 | 29.9 | 33 | 12.6 | |
| Read | 96 | 18.4 | 48 | 18.4 | 48 | 18.4 | |
| Used to help in clinical decision making | 12 | 2.3 | 0 | 0 | 12 | 4.6 | |
| Relative risk | | | | | | | |
| Incorrect | 135 | 25.9 | 96 | 36.8 | 39 | 14.9 | <0.001 |
| Partially correct | 186 | 35.6 | 93 | 35.6 | 93 | 35.6 | |
| Correct | 201 | 38.5 | 72 | 27.6 | 129 | 49.5 | |
| Absolute risk | | | | | | | |
| Incorrect | 127 | 24.3 | 83 | 31.8 | 44 | 16.9 | <0.001 |
| Partially correct | 192 | 36.8 | 102 | 39.1 | 90 | 34.5 | |
| Correct | 203 | 39.8 | 76 | 29.1 | 127 | 48.7 | |
| Systemic review | | | | | | | |
| Incorrect | 118 | 22.6 | 80 | 30.7 | 38 | 14.6 | <0.001 |
| Partially correct | 293 | 56.1 | 128 | 49 | 165 | 63.2 | |
| Correct | 111 | 21.3 | 53 | 20.3 | 58 | 22.2 | |
| Odds ratio | | | | | | | |
| Incorrect | 156 | 29.9 | 103 | 39.5 | 53 | 20.3 | <0.001 |
| Partially correct | 285 | 54.6 | 120 | 46 | 165 | 63.2 | |
| Correct | 81 | 15.5 | 38 | 14.6 | 43 | 16.5 | |
| Meta-analysis | | | | | | | |
| Incorrect | 184 | 35.2 | 131 | 50.2 | 53 | 20.3 | <0.001 |
| Partially correct | 289 | 55.4 | 114 | 43.7 | 175 | 67.1 | |
| Correct | 49 | 9.4 | 16 | 6.1 | 33 | 12.6 | |
| Clinical effectiveness | | | | | | | |
| Incorrect | 137 | 26.3 | 93 | 35.6 | 44 | 16.9 | <0.001 |
| Partially correct | 314 | 60.1 | 139 | 53.3 | 175 | 67 | |
| Correct | 71 | 13.6 | 29 | 11.1 | 42 | 16.1 | |
| Number needed to treat | | | | | | | |
| Incorrect | 101 | 19.4 | 55 | 51.1 | 46 | 17.6 | 0.565 |
| Partially correct | 302 | 57.8 | 146 | 55.9 | 156 | 59.8 | |
| Correct | 119 | 22.8 | 60 | 23 | 59 | 22.6 | |

used for the analysis. $P \leq 0.05$ was considered statistically significant.

Ethical considerations

The research proposal was approved by IRB of Faculty of Medicine, Mansoura University. Oral consent was obtained from the residents recruited in the study.

Results

The mean age of the participants was 29 ± 4 and 55.2% of them were males, the mean period since graduation was 5.2 ± 2.3 years and the mean duration of residency was 3 ± 1 (data not shown in tables). The knowledge of residents of

Table (1b): Residents’ level of understanding of the common technical terms and databases used in EBM

| Knowledge | Total | MGH (261) | MUH (261) | p |
|-----------|-------|-----------|-----------|---|
|-----------|-------|-----------|-----------|---|

MUH about evidence based medicine was significant higher ($p \leq 0.001$) than those of MGH with regards to Cochrane database of systematic reviews, Relative risk, absolute risk, systemic review, odds ratio, systemic analysis, clinical effectiveness, heterogeneity, publication bias, reliability, validity, significance test and likelihood ratio (Table 1).

Table 2 shows that the residents of MUH had significantly better attitude and practice ($p \leq 0.001$) than those in MGH. In MUH 40.2% extremely welcomed the

| | No. | % | No. | % | No. | % | |
|--------------------------|-----|------|-----|------|-----|------|--------|
| Heterogeneity | | | | | | | |
| Incorrect | 152 | 29.1 | 104 | 39.8 | 48 | 18.4 | <0.001 |
| Partially correct | 271 | 51.9 | 115 | 44.1 | 156 | 59.8 | |
| Correct | 99 | 19.0 | 42 | 16.1 | 57 | 21.8 | |
| Publication bias | | | | | | | |
| Incorrect | 191 | 36.6 | 122 | 46.7 | 69 | 26.4 | <0.001 |
| Partially correct | 278 | 53.3 | 117 | 44.8 | 161 | 61.7 | |
| Correct | 53 | 10.1 | 22 | 8.4 | 31 | 11.9 | |
| Confounders | | | | | | | |
| Incorrect | 189 | 36.2 | 101 | 38.7 | 88 | 33.7 | 0.48 |
| Partially correct | 294 | 56.3 | 142 | 54.4 | 152 | 58.3 | |
| Correct | 39 | 7.5 | 18 | 6.9 | 21 | 8 | |
| Reliability | | | | | | | |
| Incorrect | 125 | 23.9 | 90 | 34.5 | 35 | 13.4 | <0.001 |
| Partially correct | 254 | 48.7 | 104 | 39.8 | 150 | 57.5 | |
| Correct | 143 | 27.4 | 67 | 25.7 | 76 | 29.1 | |
| Validity | | | | | | | |
| Incorrect | 129 | 24.7 | 98 | 37.5 | 31 | 11.9 | <0.001 |
| Partially correct | 271 | 51.9 | 107 | 41 | 164 | 62.8 | |
| Correct | 122 | 23.4 | 56 | 21.5 | 66 | 25.3 | |
| Significance test | | | | | | | |
| Incorrect | 140 | 26.8 | 90 | 34.5 | 50 | 19.2 | <0.001 |
| Partially correct | 244 | 46.8 | 105 | 40.2 | 139 | 53.3 | |
| Correct | 138 | 26.4 | 66 | 25.3 | 72 | 27.6 | |
| Likelihood ratio | | | | | | | |
| Incorrect | 169 | 32.4 | 99 | 37.9 | 70 | 26.8 | <0.001 |
| Partially correct | 258 | 49.4 | 118 | 45.2 | 140 | 53.7 | |
| Correct | 95 | 18.2 | 44 | 16.9 | 51 | 19.5 | |

EBM concept comparing to 20.7% in MGH. The corresponding figures are 54% and 29.9% for the believe that research is extremely useful in patient management. More than half (54%) of the residents of MUH strongly agreed that EBM improves patient care compared to 43.3 % those of MGH. There are also significant differences between residents of both hospitals regarding their view to the ways to move from opinion-based practice towards EBM, major barriers to practicing EBM in general practice and limitation of EBM. Only nine percent of MUH residents disagreed on that adoption of EBM increases demand on already overloaded physician compared to 34.5% of those in MGH with highly significant difference ($p \leq 0.001$). Most of the residents of both hospitals hadn't receive

training in search strategies (66.7% and 87.4%; respectively with $p \leq 0.001$).

Discussion

The high response rate in this study is intermediate to the response rates in previous studies that varied from 70.5% in Jordan¹³, 86% in Saudi Arabia¹⁴ to 97.3% in Qatar.⁶

Cochrane library which has been available since 1992 has been evaluated as the best single source of solid evidence related to health care outcome offering more updated systematic reviews, meta-analysis and randomized clinical trials.^{15,16}

Unfortunately, the current study revealed that more than half the participants were unaware of this database and only 2.3%

Table (2): Residents' attitude and practice towards EBM

| Attitude and practice towards Evidence Based | Total | | MGH (261) | | MUH (261) | | p |
|--|-------|---|-----------|---|-----------|---|---|
| | No | % | No | % | No | % | |

| Medicine | | | | | | |
|---|---|------|-----|------|-----|------|
| Attitude towards concept of EBM | | | | | | |
| Not welcoming | 57 | 10.9 | 36 | 13.8 | 21 | 8.1 |
| Welcoming | 306 | 58.6 | 171 | 65.5 | 135 | 51.7 |
| Extremely welcoming | 159 | 30.5 | 54 | 20.7 | 105 | 40.2 |
| Attitude of most of your colleagues towards EBM | | | | | | |
| Not welcoming | 45 | 8.6 | 30 | 11.5 | 15 | 5.7 |
| Welcoming | 258 | 49.4 | 126 | 48.3 | 132 | 50.6 |
| Extremely welcoming | 219 | 42.0 | 105 | 40.2 | 114 | 43.7 |
| Usefulness of research findings in your day to day patients management | | | | | | |
| Useless | 39 | 7.5 | 24 | 9.2 | 15 | 5.7 |
| Moderately useful | 264 | 50.6 | 159 | 60.9 | 105 | 40.2 |
| Extremely useful | 219 | 41.9 | 78 | 29.9 | 141 | 54.1 |
| Practicing EBM improves patient care | | | | | | |
| Disagree | 62 | 11.9 | 49 | 18.7 | 13 | 4.9 |
| Agree | 205 | 39.4 | 99 | 38.0 | 106 | 40.6 |
| Strongly agree | 275 | 52.7 | 113 | 43.3 | 142 | 54.4 |
| EBM is of limited value due to lacks a scientific base | | | | | | |
| Disagree | 50 | 9.6 | 40 | 15.3 | 10 | 3.8 |
| Agree | 251 | 48.1 | 111 | 42.5 | 140 | 53.6 |
| Strongly agree | 221 | 42.3 | 110 | 42.1 | 111 | 42.5 |
| Adoption of EBM increases demand on already overloaded physician | | | | | | |
| Disagree | 114 | 21.8 | 24 | 9.1 | 90 | 34.5 |
| Agree | 261 | 50.0 | 132 | 50.6 | 129 | 49.4 |
| Strongly agree | 147 | 28.2 | 105 | 40.2 | 42 | 19.1 |
| Ways to move from opinion-based practice towards EBM | | | | | | |
| identify and appraise the primary literature or systematic reviews | 108 | 20.7 | 69 | 26.4 | 39 | 14.9 |
| seeking and applying EB summaries that obtained from abstracting journals | 157 | 30.1 | 75 | 28.7 | 82 | 31.4 |
| using EB practice guidelines or protocols developed by colleagues for use by others | 257 | 49.2 | 117 | 44.8 | 140 | 53.6 |
| Major barriers to practicing EBM in general practice | | | | | | |
| nonunderstanding of it or lack of scientific base | 135 | 25.9 | 81 | 30 | 54 | 17.3 |
| lack of training courses | 279 | 53.3 | 189 | 72.4 | 90 | 34.5 |
| lack of resources | 27 | 5.1 | 6 | 2.3 | 21 | 8.0 |
| lack of system management | 51 | 9.8 | 15 | 5.7 | 36 | 13.8 |
| lack of time | 33 | 6.2 | 0 | 0 | 33 | 12.7 |
| When did you last do a search which influenced your practice? | | | | | | |
| Last month | 141 | 27.0 | 72 | 27.6 | 69 | 26.4 |
| Last year | 237 | 45.4 | 99 | 37.9 | 138 | 52.9 |
| Before one year | 144 | 27.6 | 90 | 34.5 | 54 | 20.7 |
| Have you ever received formal training in search strategy? | | | | | | |
| No | 402 | 77.0 | 228 | 87.4 | 174 | 66.7 |
| Yes | 120 | 23.0 | 33 | 12.6 | 87 | 33.7 |
| Have you ever received formal training in critical appraisal? | | | | | | |
| No | 456 | 87.4 | 240 | 92.0 | 216 | 82.8 |
| Yes | 66 | 12.6 | 21 | 8.0 | 45 | 17.2 |
| Have you attended any EBM courses? | | | | | | |
| No | 408 | 78.2 | 210 | 80.5 | 198 | 75.9 |
| Yes | 114 | 21.8 | 51 | 19.5 | 63 | 24.1 |
| of them used it to help in the clinical decision making. Similar results have | been reported by other studies performed in many countries. ^{5, 17-19} | | | | | |

However, considerably lower rates of awareness of evidence-based medicine resources were reported by a study conducted in Jordan¹³ where only 25 percent of respondents were aware of EBM resources. Other studies reported that the most understood EBM resources were PubMed and Google Scholar with much less use of the Cochrane Library.²⁰⁻²²

In order to practice EBM, physicians have to understand & use terms that are necessary for critical appraisal. As a group, most of the respondents had some understanding of the technical terms used in EBM. However, less than 10% of the total respondents had correct knowledge about meta-analysis and only 7.5% of them fully understand confounders. This was similar to other study where respondents showed lack of knowledge regarding the technical terms used in EBM.²³ On comparing groups, a significantly higher level of correct answers is detected for the favor of MUH residents in the understanding of most of the technical terms and this can be explained by the formal training on the research methodology and bio-statistics as a subsidy courses for their postgraduate education. Furthermore, a higher percentage of these residents attended formal training about search strategy and critical appraisal.^{13,24}

Positive attitude toward EBM can be seen as a good sign for the success in promoting the practice of EBM and thus improving the quality of patients care. Between welcoming and extremely welcoming, about 89% of the respondent and 91.4% of their colleagues had positive attitudes toward EBM. This is similar to recent Egyptian study where (77.8%) of participants reported positive attitude towards EBM.²⁵ This was also indicated in many international studies.^{6,13,14,20,26,27}

In addition, 92.5% of participants agreed that research findings are useful (moderately and/or extremely) in patient management. Similar results were obtained by some Egyptian studies that revealed 81.4% and 82.3% of participants believe about the usefulness of research findings in patient management respectively [25,28]. This was similar to study conducted among Jordanian family physicians.¹³

This study indicated that 88.1% of participants agreed that practicing EBM improve patient care. Similarly, 89.9% and 90% of participants indicated that EBM would improve patient outcomes in Egyptian studies.^{25,28} However, other study reported much lower rates where only 65% of participants said that EBM improve patient care.²¹

Although there is a significant difference in views on how best to shift from opinion based to evidence based medicine between the studied groups, in alliance with a study conducted in Jordan⁵, about 50% of the respondents thought that the most effective way to shift from opinion based practice to EBM was “using evidence based guidelines or protocols developed by colleagues for use by others”. However, other studies nominated different strategies. For example, creating ample opportunity to study, teaching research methods & application of their results, establishing a modified training courses on evidence based medicine & publishing systematic, transparent and understandable database in the organizations can help the worldwide use of EBM.^{29,30}

A significant difference in the view of the barriers to practice EBM was detected between the studied groups. However, the main perceived barrier was the lack of training courses about EBM. Also, a recent study²⁵ revealed that the major barriers reported by participants were work overload, lack of time,

colleagues' attitudes, lack of skills, and the fear of criticism. However, other study reported lack of facilities as the main barrier³¹ while negative attitude & poor education were the most important barriers in a different study.³² Many studies all over the world found lack of personal time together with lack of updated database were the major barriers.^{24,27,33,34}

A systematic review³⁵ highlighted that lack of knowledge & skills strongly affected EBM practice. In this study, lack of training courses become more evident taking in consideration that, only 21.8% of the respondents have attended any EBM courses and 23% have ever received formal training in research strategy and only 12.6% have ever received formal training in critical appraisal. Different rates of attending training courses have been reported from different studies. For example, 18.2% of participants in one study attending EBM courses and 10% critical appraisal courses²⁸, in other study, 7.2% of participants enrolled in EBM training courses and only 4 % in critical appraisal training.²⁶ Also, more than half studied group (55.8%) attended courses in EBM and 6.8 on critical appraisal.²⁵

This difference could be attributed to the discrepancies in age groups and level of qualification of the participants and also it reflects the difference in the study programs and training courses made available for the physicians in different educational institutions and hospitals.

Conclusions

Although there is a high positive attitude among physicians towards EBM. However, there is lack in knowledge and skills of EBM. Also, higher level of knowledge and practice among university staff is still unsatisfactory.

Recommendations

EBM is the current gold standard for clinical decision-making and patient's health care worldwide. Effective EBM educational and training program (workshop, simulation exercises for and on job training) for both Mansoura University Mansoura General Hospitals staff is highly recommended. An action is needed to address and overcome the barriers of practicing EBM.

Limitations

The present study illustrated the knowledge and attitudes concerning EBM in Mansoura. However, this study has some limitations. It relies on self-reported and self-judgment for respondent's own knowledge and practice which harm the objectivity of the responses, causing potential biases. Also, the sample size was small for the findings to be generalized. Moreover, this study lacks a validated scale to score the knowledge, attitude and practice of participants regarding evidence-based medicine.

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