

# Evidence-Based Medicine and Computer Skills of Medical Professionals in Bulgaria

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**Abstract.** The aim of this study is to demonstrate medical professionals' opinion about integration of Evidence-Based Medicine (EBM) discipline into medical curriculum, in Bulgaria, and the relation with their computer skills. Evidence is necessary in medicine. For medical professionals is important to have the appropriate computer skills, in order to search and find the best available evidence in their daily practice. EBM is a discipline that will provide them with tools useful in the management of patient.

The survey was conducted among medical professionals included physicians, dentists, nurses, midwives, and physiotherapists. A questionnaire was used in order to achieve the purpose of the study. In this paper, we include survey results information, covering the application of EBM in medical professional's daily practice and demographic characteristics.

Analysis of the data demonstrates the need of integration EBM discipline in medical education. Clinical decisions in medicine must be based on values and evidences. Medical professionals with good computer skills and using EBM in everyday practice can reach the best evidences.

**Keywords:** EBM, computer skills, medical professional education.

## 1 Introduction

The first appearance of the term EBM was in a publication in the American College of Physicians' Journal Club by Gordon Guyatt in 1991 [1]. EBM is defined by David Sackett as “the conscientious, explicit, and judicious use of current best evidence in making decision about the care of individual patients” [2]. Conceptually EBM involves three fundamental principles. First, optimal clinical decision making requires awareness of the best available evidence, which ideally comes from systematic summaries. Second, EBM provides guidance to decide whether evidence is more or less trustworthy and third evidence alone is never sufficient to make a clinical decision. Decision makers must always trade off the benefits and risks, burden, and costs associated with alternative management strategies and in doing so, consider their patients unique predicament, values, and preferences [3].

The practice of EBM includes 5 steps:

1. to formulate an answerable question (about therapy, diagnosis, prognosis and prevention),
2. search and find the best evidence, with which to answer that question,
3. critically appraising the evidence for its validity (closeness to the truth), impact (size of effect), and applicability,
4. apply the results and integrate them with the clinical expertise and patient's values and preferences, and
5. evaluate the efficiency and effectiveness in executing 1 – 4 steps and find ways to improve them for next time [4].

Due to Internet technology, the increasing volume of new literature, and medical information systems and platforms, including wide spread applications for information gathering [5] finding useful evidence is a big challenge for health professionals. The practice of EBM with the five steps can help medical professionals to be more productive while updating their knowledge. Computer skills are essential for medical professionals. They help to navigate through existing EBM resources and find the current best evidence. This is the way to deal with the changing information explosion

## **2 Methodology**

In this paper, we show the results from a study focused on the integration of EBM in medical curriculum in Bulgaria, conducted from June to December 2018.

The methodology used in this study is based on a questionnaire among medical professionals (physicians, dentists, nurses, midwives and physiotherapists). Completed questionnaires were received from 311 medical professionals. Of the respondents 38% were nurses, 36% physicians, 12% dentists, 12% midwives, and 3% physiotherapists. The questionnaire contained three sections and included total 47 questions. The collected information was anonymous and all the participants were volunteers.

The first section of the questionnaire included 14 questions related to demographic characteristics and asked participants to describe professional and personal characteristics such as age, nationality, computer skills, etc. The second section of the questionnaire included questions about medical professional's attitude towards EBM. The total number of questions in this part was 21. Finally, the last (third) part of the questionnaire asked responders about the application of EBM into their every-day clinical practice.

The majority of the questions were formulated as closed questions, but open

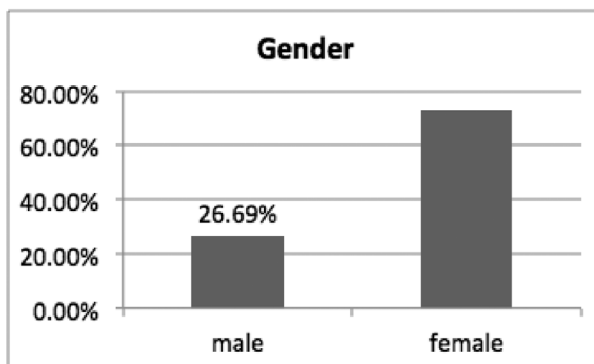
questions were as well included. Statements related to closed questions were given a range for the answer in:

- Yes / No
- Yes, No, “ I cannot evaluate”
- “strongly agree”, “I agree “, “I can not evaluate”, “disagree”, and “strongly disagree”

In this article, we partially present the results of the first section of the questionnaire, related to demographic results about the computer skills of the medical professionals; and how they evaluate this knowledge. We also demonstrate results related to the impact of computer skills level on the application of EBM in medical professionals’ daily practice.

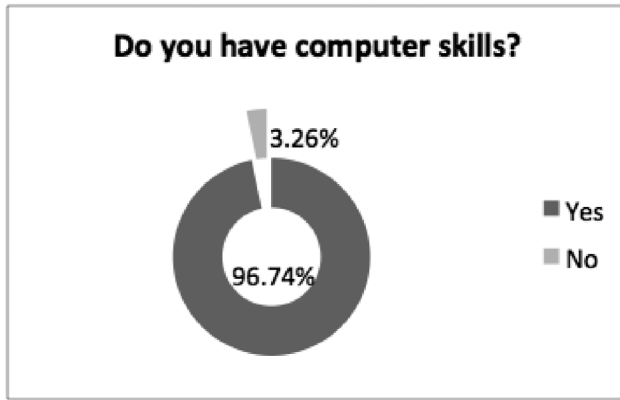
### 3 Results

Completed questionnaires were received from 311 medical professionals. The results of the survey show that the majority of respondents were women 73%, and 27% men.



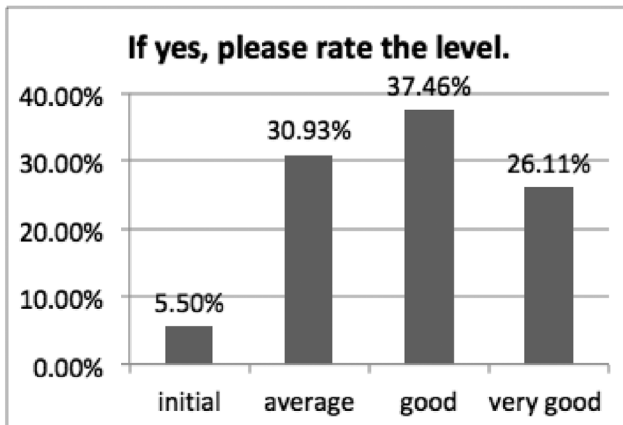
**Figure 1:** Respondents distribution per gender.

It is worth mentioning two questions related to medical professionals computer skills and how they evaluated their computer competence. Among medical professionals, 97% reported computer skills and only 3% did not report such a competence.



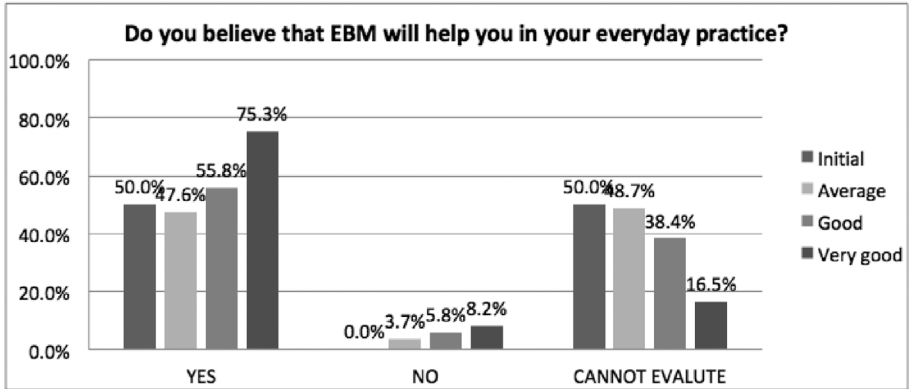
**Figure 2:** Medical professionals’ competence in computer skills.

The interesting point of the demographics information is data which demonstrates that 37% of surveyed participants rate their computer skills as good, 31% consider it average, 26% consider it very good, and only 5% rate it as initial.



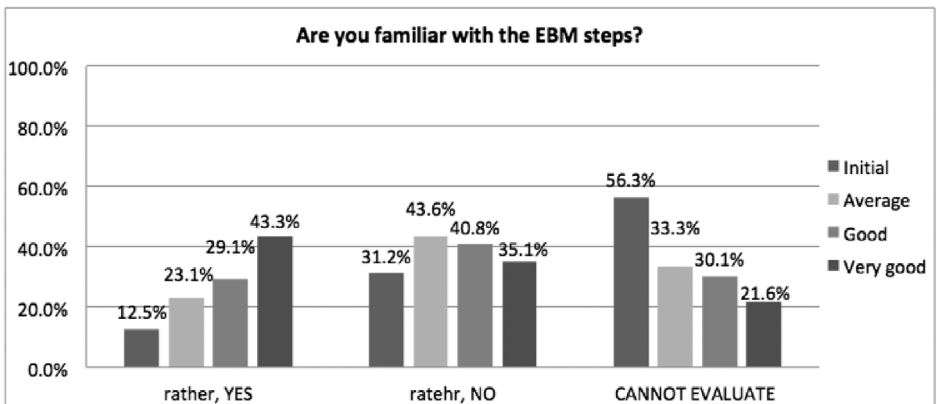
**Figure 3:** Medical professionals’ computer skills level rating (for positive answer in computer skills competences).

The relationship between the level of computer skills and the use of EBM in everyday practice was analyzed (Fig. 4). Fisher’s exact test shows a statistically significant relationship with  $p = 0.001 < 0.05$ . The results show that in the “very good” category, in terms of level of computer skills, those who believe that learning more about EBM would be useful in their daily work is 75.3%, which is three times more than those who believe the opposite or can not evaluate. Therefore, a good level of computer skills would contribute to better implementation of evidence-based medicine and the application of good medical practices.



**Figure 4:** Relation between medical professionals' computer skills level and the application of EBM in their daily practice.

Finally, in relation to the main steps of EBM, the relationship is much stronger in the groups with low and medium levels of competence. Pierson's  $\chi^2$  test found a statistically significant relationship with a significance level of  $p = 0.032 < 0.05$  and  $\chi^2 = 13.811$ . The results (Fig. 5) show that in the low and medium computer skills groups, those who do not know or are not sure about the main EBM steps are between 75% and 85%, which is three, four times more than those who believe they are familiar with the EBM steps.



**Figure 5:** Relation between medical professionals' computer skills level and their familiarity with the EBM steps.

## Conclusions

In conclusion, from the conducted research we see that experienced medical professionals address clinical questions, which need to be based on the current best evidence, in order to optimally, treat patients. EBM helps, health providers to make an efficient and effective medical literature searching and answer these questions. Medical professionals' computer skills are essential for the integration of EBM in everyday practice. Efforts should be put in both introducing EBM as a discipline in medical curricula and improving medical professionals' knowledge of computer skills.

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